



# **MULTINATIONAL FORCE STANDING OPERATING PROCEDURES (MNF SOP)**



**MNF SOP - SPECIAL EXTRACT  
CBRN-TIM Consequence Management  
CBRN-TIM Defense**

**Version: 2.6  
October 2010**

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## PREFACE

This is an extract of two sections from the MNF SOP Version 2.6, Oct 2010. This extract can be found at the Multinational Planning Augmentation Team (MPAT) home page (select the “MNF SOP Tab”) found at [www.mpat.org](http://www.mpat.org)

**Section 1:** Part D, Chapter 1: MNF SOP Missions, Annex D: CBRN-TIM Consequence Management.

**Section 2:** Part C, Chapter 9: HQs Processes/Functions, Annex D: CBRN-TIM Defense.

This extract provides the “start points” for the above areas when activating a Coalition / Combined Task Force (CTF) – or a multinational headquarters in general terms. It outlines the processes and procedures for the establishment of integrated operations using a comprehensive approach planning approach supported by a whole of government effort within the MPAT nations (31 nations with interests in the Asia-Pacific region).

This SOP has the end state of achieving integrated operations between militaries, nation’s governments, humanitarian community (HC) and all key stakeholders present within the operational environment (private corporations, tribes, and/or any element that needs to be part of the solution to a crisis).

**Note:** the HC defined as the aggregate of International Organizations [IO], Nongovernmental Organizations [NGO], International Committee of the Red Cross [ICRC], International Federation of Red Cross and Red Crescent Societies [IFRC], national Red Cross and Red Crescent Societies, and UN agencies, funds and programmes. This SOP seeks to establish inclusiveness and cooperation with the HC via organizational structures, processes and coordination procedures.

Refer to [www.mpat.org](http://www.mpat.org) for review of the full version of the MNF SOP for details.

**CAUTION:** These documents outlines “start points” for multinational efforts that has been coordinated over the past decade with the MPAT nations CBRN-TIM planning experts and Chemical, Biological Incident Response Force (CBRIF) units (specifically those of the United States, Australia, and Singapore). It is not meant to be authoritative in terms of specific procedures or measures for a specific situation – it is a guide. In specific situations the procedures and measures within **MAY BE REFINED and CHANGED** to adapt to the situation based upon Commander’s requirements and the operational environment. FULL understanding of the operational environment and judgment are required in execution for effective mission accomplishment – NOT just blind following of SOPs. Also, foreign affairs/state departments of the MPAT nations are in the lead normally in such situation with the military in support of their efforts.

The intent of this SOP is to increase the speed of response, interoperability, mission effectiveness, and unity of effort in multinational force (MNF) Operations within the Asia-Pacific region during crisis action situations. It is designed to reduce the ad-hoc nature of multinational crisis action planning by:

1. Establishing common “Operational Start Points” for MNF operations.
2. Establishing standing operating procedures for the MNF headquarters.

It is primarily focused on the operational level of planning and execution (CTF level forward in the area of operations – working with the affected/host nation(s)). It is designed to address military operations other than war (MOOTW) and small-scale contingencies (SSCs). It is intended for commanders and staffs who plan and execute MNF missions within coalition, combined and UN operations. It also can assist joint task forces and strategic headquarters of MPAT nations as a frame of reference but is not intended to address the strategic level planning efforts.

This SOP is broad and generic in nature to allow for flexibility in application. However, it is designed to be detailed enough to serve as a guide for the establishment and forming of a Coalition / Combined Task Force (CTF) and act as a solid framework for plans development and execution of multinational operations.

This SOP provides a framework and process for developing consensus between nations on multinational operational concepts.

This SOP represents a broad inclusion of doctrine, processes, terms, lessons learned, and inputs from nations participating in the Multinational Planning Augmentation Team (MPAT) program. Further, it incorporates the ongoing work by the Multinational Interoperability Council (MIC) by the US Joint Staff.

This SOP is not a binding international agreement between the participating nations. The document is merely a set of standing procedures that do not create any rights or obligations on or among the participating nations.

**MNF SOP – SPECIAL EXTRACT**  
**Version 2.6 – October 2010**

**Multinational Planning Augmentation Team (MPAT) Secretariat  
Headquarters, U.S. Pacific Command  
Box 64049 (J722)  
Camp H. M. Smith  
Honolulu, Hawaii 96861-4049**

**Phone: 1- 808 477 8267 or 8262  
Mr. Scott Weidie or Mr. John Bratton  
MPAT Secretariat Office (J716 USPACOM)**

**Primary Internet Portals:**

**[www.mpat.org](http://www.mpat.org)**

**or**

**<https://community.apan.org/mpat/>**

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# **Multinational Forces Standing Operating Procedures (Version 2.6)**

## **MNF SOP - Special Extract**

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## ANNEX D

## CBRN-TIM CONSEQUENCE MANAGEMENT

1. **Purpose.** This Annex describes the procedures for the conduct of multinational Consequence Management (CM) planning and operations. In this SOP, CM is defined as actions to mitigate the effects of chemical, biological (including serious diseases and epidemics), radiological, nuclear (CBRN) and toxic industrial materials (TIM) incidents. CM can be due to natural / accidental (unintentional) or threat-based (intentional) incidents. Whether or not an incident is intentional, ineffective CM efforts relative to the CTF or the host nation may lead to mission failure (graphically depicted in Figure D-1-D.1).

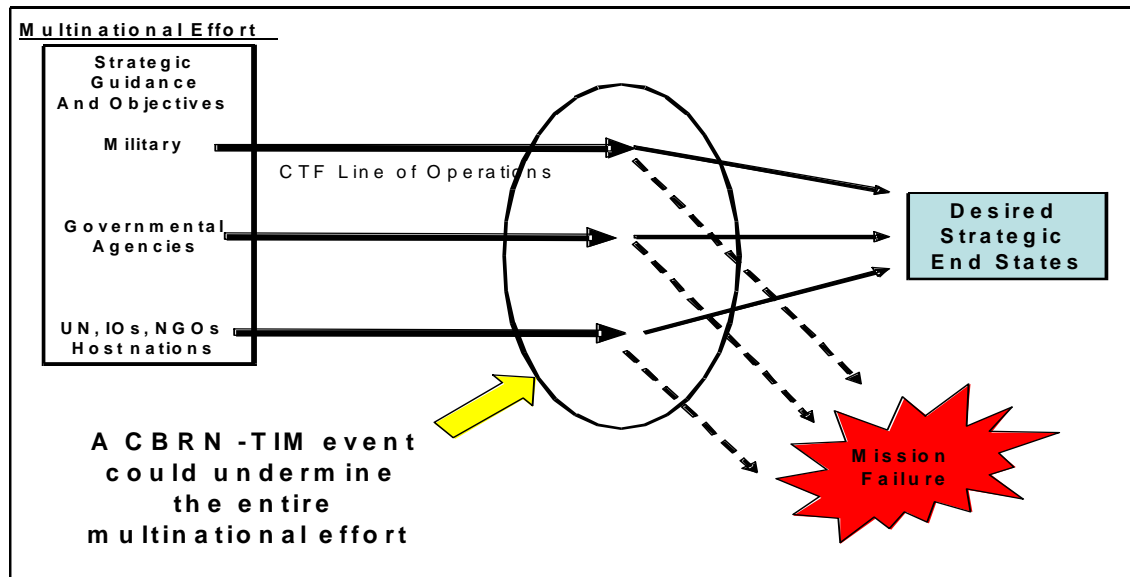


Figure D-1-D.1: Impact of Ineffective CBRN-TIM CM Efforts

It should be noted that the above definition includes the spread of serious diseases and/or epidemics within a given population/host nation. This is done because affected nations may require similar international assistance in such situations. Moreover, at the beginning of a CM incident the initial response for a serious disease / epidemic outbreak will be quite similar to the initial response against an intentional use of biological agents. Further, the follow-on actions will also closely parallel the steps for managing the consequences of a biological agent attack.

**Note:** The term Consequence Management has multiple definitions and can cause disagreements among planners that counter establishing early unity of effort. Some definitions include Humanitarian Assistance and Disaster Relief (HA/DR) and CBRN-TIM incidents; others only focus on CBRN-TIM, and others even use different descriptive titles such as “WMD attacks”, “incident response”, and “national response incidents”.

This MNF SOP cannot solve this dilemma. However, as a starting point, this SOP will use the following terminology definitions:

> CBRN-TIM Defense refers to the force protection of the CTF command and actions taken to manage the consequences of CBRN-TIM incidents that affect the CTF (some call this the “inside” CTF mission or the CTF-focused mission).

> CBRN-TIM host nation CM refers to CM of the host nation (some call this the “outside” CTF mission or the host nation-focused mission).

In all training, exercises, and actual incidents it will be essential that the Commander, CTF establish a definition for clear communication within the command.

2. **Overview.**

2.1. **Operations.** CTF CBRN-TIM CM operations will likely occur during two types of crisis situations as explained below and in Figure D-1-D.2.

2.1.1. **CTF Established to Perform CM.** The first situation occurs when a CTF is activated and formed for a CBRN-TIM CM mission (hereafter referred to as “CM Operations”).

i. In this case, CM actions will be focused on the host nation population and the host nation infrastructure affected by the CBRN-TIM incident.

2.1.2. **CTF Already Deployed.** The second type of situation occurs when the CTF is already deployed with an ongoing mission and a CBRN-TIM incident occurs. In this case, the CTF has primary responsibility for CM of itself and the other organizations operating with it. In this environment the CTF will still need some ability to perform CM for the surrounding host nation population or risk losing host nation support. This situation requires the CTF to either:

i. Conduct CBRN-TIM CM operations as a “branch” to the main mission (hereafter called “CM Branch Plan” wherein the mission end state does not change) or,

ii. Assume a “sequel” when the incident is of such significance as to become the new main mission of the CTF (hereafter referred to as “CM Sequel” wherein the mission end state changes to a CM related one, at least as an interim objective, the accomplishment of which could lead to the formulation of a new end state).



Figure D-1-D.2: Consequence Management Situations

2.2. **Force Protection Considerations.** CTF planning and operations require the use and implementation of force protection procedures against CBRN-TIM threats contained in this SOP. [Refer to Part C, Chapter 9: CBRN-TIM Defense.](#)

### 2.3. Concept of Operations. CTF CM missions will generally be guided by the following:

- 2.3.1. **Environment.** The conduct of CM operations will occur in a complex environment that will impact and require response by many sectors of a society. While CTF forces will be focused on the accomplishment of military tasks to achieve the conditions that support the mission, it is important that plans and operations include non-military elements required to achieve the end state and overall mission success.
- i. CM operations should strive for an integrated operations approach ([refer to Part A, Chapter 1: Operational Factors for discussion on integrated operations](#)) that yields unity of effort within all CTF operations.
  - ii. Note that this “whole of international community” approach only increases the incentives for an adversary to at least threaten the use of CBRN-TIM, as such threats may discourage members of the international community from contributing forces to a CTF.
- 2.3.2. **Organization.** The CTF headquarters (CTF HQ) and CTF components should be task organized to accomplish the assigned mission and contingency missions. There are three broad approaches for this. All of these options require a CBRN-TIM Defense Special Staff. [Refer to Part C, Chapter 8: CBRN-TIM Defense Special Staff.](#) All three approaches would also take advantage of the International Humanitarian Community (IHC - the aggregate of International Organizations (IOs), Nongovernmental Organizations (NGOs), International Commission of the Red Cross (ICRC), International Federation of Red Cross and Red Crescent (IFRC) and National Red Cross and Red Crescent Societies, and the UN agencies / funds / programmes). The IHC organizations would play major roles in the various CM activities but would be outside the CTF’s direct command, working on a cooperative basis.
- i. **Option 1:** The CTF HQs and CTF components will be formed in accordance with the starting point template for the organization of the CTF headquarters and CTF components. [Refer to Part B, Chapter 2: Multinational Headquarters Organization and CTF Command, Control, Coordination, and Cooperation.](#)
  - ii. **Option 2:** The CTF HQ and CTF components may be organized functionally to address the threat where the CTF’s primary mission is responding to the effects of a CM incident.
  - iii. **Option 3:** The CTF command may opt to form a CBRN-TIM Task Force as one of the CTF components to specifically address a CBRN-TIM threat. A CBRN-TIM Task Force can be used as an option for CM branch / sequel operational planning. [Refer to Part B, Chapter 2: Military Decision Making Process –Multinational \(MDMP-M\).](#)
- Note:** A multinational force may be established to conduct CM operations. In some cases a response to a CBRN-TIM incident may have nations deploying separate Joint Task Forces (JTFs) that are linked together through a coordination process.
- 2.3.3. **CTF Headquarters Coordination and Cooperation Organizations.** Within the CTF headquarters the following organizations are created to facilitate coordination and cooperation between the multinational military, civil-governmental, and humanitarian elements responding to the operation. These include:
- i. **Multinational Coordination Center (MNCC)** for military-to-military coordination between multinational forces in the CTF and non-CTF forces, if present. [Refer to Part B, Chapter 2: Multinational Coordination Center.](#)
  - ii. **Civil-Military Operations Center (CMOC)** for coordination between the military forces (CTF and non-CTF) and IHC.
  - iii. **Joint or Multinational Interagency Coordination Groups (JIACG and / or MNIG)** for coordination of single-nation or multinational interagency/inter-ministerial organizations

### 3. Planning.

3.1. **Threat.** [Refer to Part C, Chapter 9: CBRN-TIM Defense for specific information on CBRN-TIM agents.](#)

3.2. **Potential CTF CM Mission Statement:** CTF will conduct CM operations in support of the Affected Nation and (if required) for the CTF to:

3.2.1. Reduce the loss of life and suffering.

3.2.2. Mitigate of the effects of the incident.

3.2.3. Support the recovery and restoration of critical/essential operations and services.

3.2.4. Set the conditions which allow the government of the affected nation and the International Humanitarian Community (IHC) to commence long term recovery efforts.

3.2.5. Allow the CTF to complete its assigned mission(s).

3.3. **Operational End State.** The end state will depend upon how the CTF assumes the CM mission.

3.3.1. **Under OPTION 1: CTF Established to Perform CM.** The suggested end state would be – “The affected nation and IHC have the ability to assume responsibility for ongoing CM operations and subsequent recovery efforts, and the CTF has completed transitioning CM responsibilities to the appropriate authorities for support of follow-on operations.”

3.3.2. **Under OPTION 2: CTF Already Deployed.** The suggested end state would be – “The affected nation and IHC have the ability to assume responsibility for ongoing CM operations and subsequent recovery efforts, and the CTF can focus fully on its mission”.

i. **CM Branch.** The suggested end state would be: NO CHANGE from original end state since CM is only a branch to the overall mission and original end state.

ii. **CM Sequel.** The suggested end state would be: “The responsibility for CM operations has transitioned to the affected nation and the IHC and the CTF is positioned to perform non-CM operations.”

Note: These operational end states are notional, as are the decisive points and supporting effects for CM operations below. Actual operational end states, decisive points, and supporting effects will be based upon essential strategic guidance, assigned mission, CTF mission analysis, and a plan developed specifically for the situation encountered.

3.4. **Mission Phasing.** This phasing outlines the major CTF sequence of operations.

3.4.1. **The five phases of a CTF CBRN-TIM CM operation** are:

i. **Phase 1:** Situation Assessment and Preparation. This phase contains deployment and lodgment, if required.

ii. **Phase 2:** Immediate Assistance.

iii. **Phase 3:** Ongoing CM Operations.

iv. **Phase 4:** Disengagement/Handover of CM Effort

v. **Phase 5:** Redeployment or Transition to Non-CM Activities.

3.4.2. These phases differ somewhat based upon how the CTF assumes the CM mission (refer to paragraph 2.1 above).

i. Under **OPTION 1: CTF Established to perform CM**. The focus of CM operations is on the affected nation's population. That nation and the IHC have primary responsibility for CM operations; the CTF provides a temporary augmentation to those capabilities until the situation is sufficiently controlled for the affected nation and the IHC to take full responsibility for continuing CM efforts. See Figure D-1-D.3.

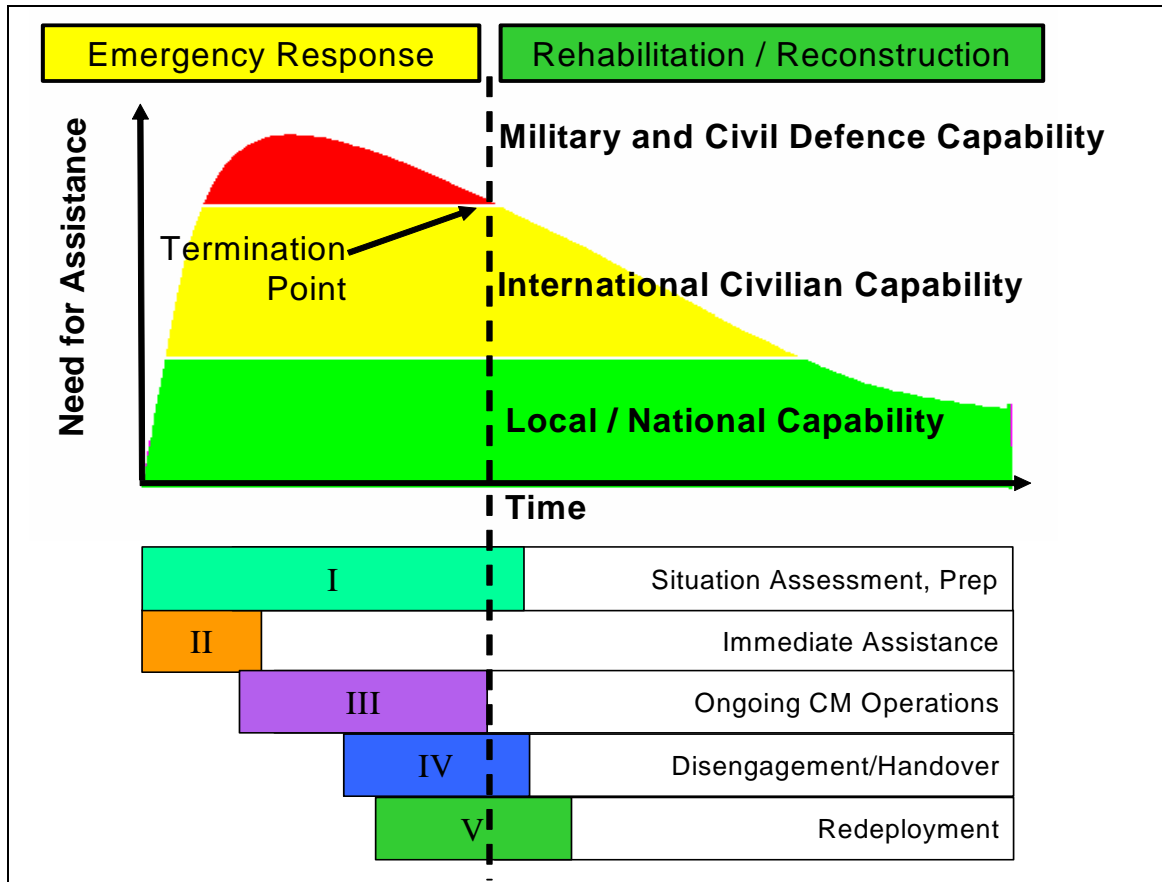
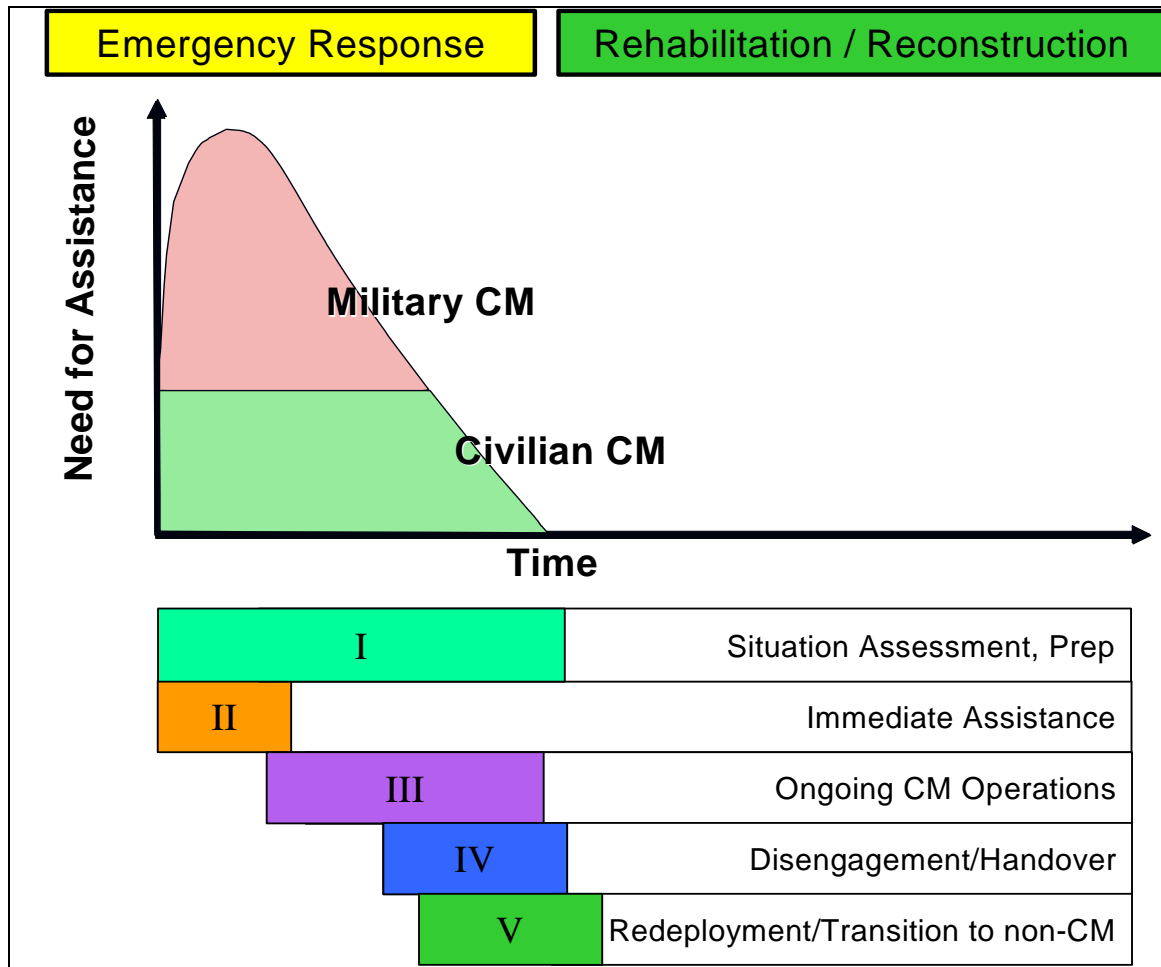


Figure D-1-D.3: Consequence Management Phasing in Option 1

ii. Under **OPTION 2: CTF Already Deployed**. In this case, the CTF commander's priority is to restore CTF operational capabilities. It will also seek to restore the capabilities of the organizations with which it has been cooperating (e.g., the IHC and elements of the affected nations government), and provide some temporary augmentation to the efforts of the affected country and the IHC in addressing other civilian CM requirements. See Figure D-1-D.4. Because the CTF will not have fully prepared for CM operations in most of these cases, Phase I would still involve some preparatory activities.



**Figure D-1-D.4: Consequence Management Phasing in Option 2**

3.4.3. In execution these phases overlap and some phasing aspects continue throughout the campaign plan.

3.4.4. If follow-on CBRN-TIM incidents occur, Phase 1 would need to begin again relative to the new incident, while the original incident might be in one of the later phases. There could thus be overlapping phases.

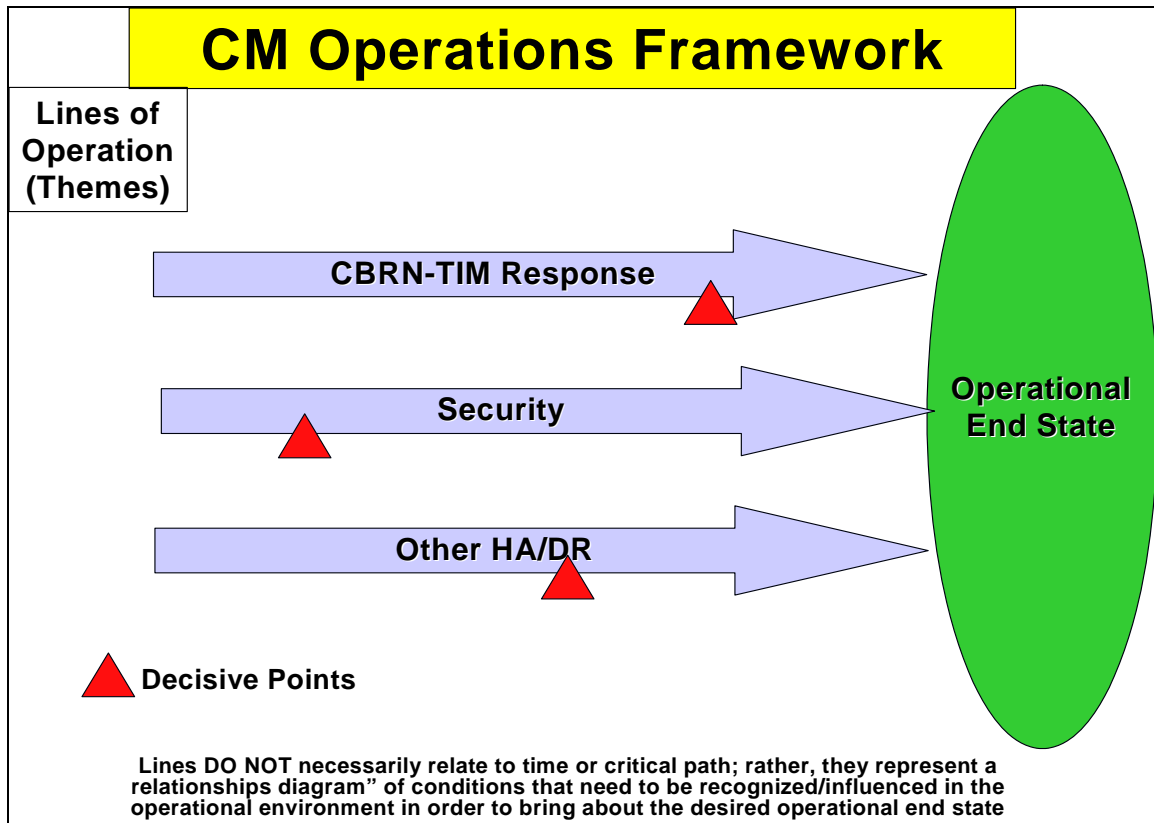
3.4.5. In addition to these five phases, considerable preparation for CM must be done in peacetime. Moreover, monitoring for CBRN-TIM incidents must be done continuously in peacetime to facilitate rapid response. These preparations and monitoring effectively constitute a Phase 0.

3.5. **Lines of Operation.** Lines of Operations are the major themes or operational activities by which the CTF operational end states are achieved. CM operations may be conducted following three lines of operation; however, planning for a specific situation may result in the identification of more or less, and different, lines of operation. The notional lines of operation are depicted in figure D-1-D.5 and explained as follows:

3.5.1. **CBRN-TIM Response.** The main focus of the operations will be on actions required to assess, mitigate, and recover from the effects of the CBRN-TIM incident.

3.5.2. **Security.** A secure environment is required to allow the affected nation and responders to focus on the CM operations. This will be especially true if the CBRN-TIM incident was an intentional act. The risk of additional threats (whether CBRN-TIM or not) must be reduced to an acceptable level to allow freedom of action. For security against follow-on CBRN-TIM [attacks refer to Part C, Chapter 9, CBRN-TIM Defense.](#)

3.5.3. **Other Related Humanitarian Assistance and Disaster Relief (HA/DR).** As part of a CBRN-TIM response, other HA/DR functions will normally need to be performed. [Refer to the Part D, Chapter 1: Humanitarian Assistance and Disaster Relief.](#)



**Figure D-1-D.5: Consequence Management Operations Framework**

4. **Decisive Points (DP) and Supporting Effects (SEs)** – conditions that support attainment of the Operational End State and mission success.

4.1. **DP #1: The consequences of the CBRN-TIM incident have been mitigated to the point that responsibility for further recovery has been transitioned to the affected nation and/or IHC.**

- CTF Established to Perform CM: CTF is prepared to withdraw.
- CTF Already Deployed (CM Operations Branch): CTF positioned to complete its original mission.
- CTF Already Deployed (CM Operations Sequel): CTF is positioned to perform non-CM operations.

4.1.1. SE #1: The effects of the CBRN-TIM incident have been assessed and characterized so that the full range of necessary CM can be carried out.

4.1.2. SE #2: CBRN-TIM effects have been mitigated, the source, contaminated equipment, and the affected area have been identified, marked (i.e. signs posted) and controlled so that CTF personnel and others can avoid exposure.

4.1.3. SE #3: Victims have been treated and decontaminated to prevent further CBRN-TIM effects and CBRN-TIM spread. Victim care has been transitioned to appropriate health organizations.

4.1.4. SE #4: In coordination with health authorities, victims who have been exposed to contagious disease have been isolated/quarantined and provided prophylaxis, if medically indicated.

4.1.5. SE #5: Handling of all human remains has been appropriately coordinated with health authorities in the affected nation in accordance with existing national policy.

4.1.6. SE #6: Handling of contaminated agricultural products has been coordinated with health authorities in the affected nation.

4.1.7. SE #7: CTF personnel are protected against CBRN-TIM effects (refer to the CBRN-TIM Defense Annex – Part C, Chapter 9, Annex D), and the CBRN-TIM effects on the CTF have been largely mitigated.

**4.2. DP #2: The affected nation's security environment allows for the conduct of effective CM and other HA/DR operations.**

4.2.1. SE #1: In support of local authorities, law and order have been sustained or restored (panic and/or chaos have been addressed and mitigated).

4.2.2. SE #2: If CBRN-TIM incident(s) occurred, the effects on the CTF have been largely mitigated and the CTF personnel are protected against follow-on attacks (refer to the CBRN-TIM Defense Annex – Part C, Chapter 9, Annex D).

**4.3. DP #3: The responsibility for humanitarian support to the local population is transitioned to the affected nation and the IHC.**

4.3.1. SE #1: In coordination with local authorities, people have been evacuated from contaminated areas, and their basic necessities (shelter, food, water, sanitation, etc.) have been provided.

4.3.2. SE #2: Critical infrastructure disruptions caused by the CBRN-TIM incident have been mitigated to allow for humanitarian support of the local population.

4.3.3. SE #3: Basic necessities (shelter, food, water, sanitation, etc.) for non-evacuated population have been provided.

**5. Assumptions.** The assumptions below outline the assumed realities required to conduct planning for CM operations. Some of the assumptions have supporting narratives to explain their 2<sup>nd</sup> and 3<sup>rd</sup> order effects.

**5.1. In any CTF operation, a CBRN-TIM incident may occur, requiring CM operations.**

**5.2. A CBRN-TIM incident may require (1) immediate assessment and (2) a response planning capability.**

**5.3. A CBRN-TIM threat assessment will be conducted prior to any deployment of a CTF.** The threat assessment involves defining CBRN threats by country and also identifies TIMs, nuclear plants, and endemic disease by country. Data would also be collected on the nature and effects of CBRN-TIM agents to enable a rapid assessment of incidents and subsequent response planning. The resulting data base becomes a reference point for responding to incidents and is updated as information about CBRN-TIM incidents is collected. If a threat assessment is not completed prior to the incident, this needs to be included in the CTF commander's initial assessment (see paragraph 6.3.1).

**5.4. A CM capability assessment will be conducted prior to any deployment of a CTF.** The capability assessment involves characterizing the CBRN-TIM CM capabilities of countries and IHC participants worldwide (though especially in high threat areas). The resulting data base is used in planning CBRN-TIM incident response, suggesting which countries can contribute to CM operations, where special capabilities can be found, and where key gaps exist which must be resolved prior to CTF deployment. If a capability assessment is not completed prior to the incident, this needs to be included in the CTF commander's initial assessment (see paragraph 6.3.1).

**5.5. Pre-deployment information operations.** Information operations planners will develop pre-packaged, agent/TIM specific talking points prior to any CTF deployment. These talking points will enable rapid and accurate dissemination of information on the agent(s) and/or TIM(s) involved in the incident, the likely health effects of these materials, and the general actions that people and organizations should take to mitigate the impacts resulting from the release of the materials. These prepared talking points can be augmented by the CTF to include information specific to the conditions in which the CTF is conducting operations.

**5.6. CM TTPs will be identified, confirmed, and coordinated with the affected nation prior to any deployment of a CTF.**

5.6.1. Decontamination TTPs: personnel, equipment, and facilities.

5.6.2. Hazardous material and waste management TTPs: must include disposal of decontamination effluent.

- 5.7. **The CBRN-TIM environment will be hazardous** and CTF and IHC personnel may require protective measures and associated training to accomplish their mission. CBRN-TIM protection may be required against conditions associated with the incident they are addressing and against follow-on incidents [refer to Part C, Chapter 9: CBRN-TIM Defense](#).
- 5.7.1. Forces participating in the CTF from many nations and almost all IHC personnel have limited or no CBRN-TIM protective capability.
- 5.7.2. Few military units have the hazardous material (HAZMAT) protections needed against the broad spectrum of TIM threats. In such situations, military and civilian HAZMAT teams may be required for the initial response with other military forces in a stand off/security support posture until the source of the TIM can be controlled.
- 5.8. **The consequences of a CBRN-TIM incident will differ by the type and quantity of CBRN-TIM agent, time of day, weather, location, and population density.**
- 5.8.1. CBRN-TIM incidents may occur in commercial, industrial, or other densely populated urban environments where consequences from casualties and destruction/disruption of critical services will be high.
- 5.9. **CBRN-TIM incidents may lead to public panic and possibly civil disorder.**
- 5.9.1. Understanding of, and sensitivity to, the issues and the nature of the CTF response may impact these effects.
- 5.9.2. In CM operations, authorities will make decisions in an emotionally charged and time-sensitive environment.
- 5.10. **The affected nation has primary responsibility.** The affected nation has primary responsibility for all CM operations except those directly impacting the CTF. Multinational CM operations are intended to supplement/provide assistance to the affected nation.
- 5.10.1. The affected nation will prioritize its response to meet the needs of its citizens over the members and priorities of the CTF.
- 5.10.2. A CBRN-TIM incident may quickly overwhelm even the most prepared nation and thus require a multinational immediate response. The extent of the needed multinational response will largely depend upon the affected nation's capabilities to respond given the severity of the situation.
- 5.10.3. The military will be in support of CM operations directed and conducted by organizations outside the CTF, and must coordinate with:
- i. In the affected nation, the State/Foreign Affairs Ministry representatives (Embassy) for the nations participating in the CTF within the affected nation.
  - ii. The affected nation's Lead Agency for CM operations.
- 5.10.4. Preparation requires the stockpiling of materials and equipment needed for CM operations, to include food, water, housing, medicines, protective equipment, and specialized equipment.
- 5.10.5. Military assistance should complement but not substitute for civilian response.
- 5.11. **The essential services in a country may be seriously affected by CBRN-TIM incidents.**
- 5.11.1. Direct effects may include the death/incapacitation of critical authorities, interruption, disruption, or cessation of critical services, and destruction of buildings, facilities, and other infrastructure.
- 5.11.2. Indirect effects may include workers deserting jobs critical to the society in order to avoid the effects of a CBRN-TIM incident or the spread of disease.

5.12. **Potential for follow-on/multiple attacks/incidents.** The occurrence of a CBRN-TIM incident increases the likelihood of additional attacks.

6. **Planning Considerations.** Outlined below are some planning considerations for CM operations. The planning effort should include overall command, control, communications, and specific efforts to support the three lines of operation. There will be some overlap between the lines of operation (e.g., situation assessment is important to both the CBRN-TIM response and security lines of operation).

6.1. **Immediate response.** In the case where the CTF is established to perform CM, the incident will likely require immediate CM operations (especially situation assessment) before a full CTF can be deployed. This may require incremental deployment of the CTF and may complicate command, control and security.

6.1.1. **Separate national Joint Task Forces (JTF) may be required to deploy immediately after an incident with teams equipped with protective gear and specialized skills related to CM operations.**

i. These separate Joint Task Forces (JTFs) should be coordinated using the MNCC concept. [Refer to Part B, Chapter 2: Multinational Coordination Center \(MNCC\).](#)

ii. JTF contributing countries will conduct bilateral coordination initially with the affected country at the national strategic levels. The United Nations (UN) may support these efforts in terms of statements or mandates.

iii. The formation of a multinational command (CTF) may be a follow-on task since formation of such a command takes time and coordination among nations.

6.2. **Establish CM Operations Command, Control, and Communications (C3).** This effort involves the command and planning for the CTF, as well as the various forms of communication used to support command and control and coordinate with the range of involved parties. The basic issues for C3, including coordination requirements, are outlined in paragraph 2.3.

6.2.1. **Place a CBRN-TIM Special Staff in all CTFs and plan to augment that staff** based upon a CBRN-TIM threat or incident. [Refer to Annex – Part C, Chapter 8: CBRN-TIM Special Staff.](#)

6.2.2. **Communications and Electronic Facilities.** Provide communications means and electronic equipment (e.g., computers) to support CTF C3.

6.2.3. **Civil Military Operations.** This effort involves civil affairs, liaison with the host nation and with the IHC, and coordination with various victim groups. See paragraph 2.3.

6.2.4. **Public Affairs and Information Operations.** Because of the potential for mass disorder and negative psychological reactions, the CTF must develop an information operations campaign informed by CBRN-TIM subject matter expertise. The information campaign must explain what has happened and what actions people (including CTF personnel) should take in response.

i. Public information: Disseminate accurate and timely information on the CBRN-TIM incident, ongoing response, casualties, etc. while protecting sensitive information.

i-i. Decide what information must be restricted to the CTF and what can be released to public.

i-ii. Establish intelligence requirements and declassification/dissemination protocols.

ii. Health awareness: Provide information for victims and help people differentiate between physical effects and likely psychological effects (to minimize the number of “worried well”).

iii. Evacuation instructions: If evacuation, isolation, and/or quarantine is called for, provide information on both the steps to be followed and the rationale behind these steps.

iv. Displaced personnel: Provide information to both the victims and those supporting CM operations on evacuation routes, assembly areas, food/water/shelter, and casualty reporting procedures.

### 6.3. CBRN-TIM Response

6.3.1. **Assessment.** The CTF Commander will make an immediate assessment, and continue to assess the situation throughout all phases of CM operations.

- i. Characterize the nature of the incident, including any uncertainties.
  - i-i. Agent identification, monitoring, rendering safe, and removal. This will include confirmation of the CBRN-TIM agent(s) and specific characterization of them (e.g., is a bacterial BW antibiotic resistant?).
  - i-ii. Areas and people affected. This may require urban search and rescue because at least some casualties may be incapacitated.
  - i-iii. Effects of the CBRNE-TIM event on people, facilities, and areas.
  - i-iv. Contamination prediction, containment prediction, and zone management.
  - i-v. Requirements for response to the incident (personnel and specialists, drugs, protective equipment, specialized equipment).
  - i-vi. Support forensic/criminal investigation for attribution.
- ii. Characterize the current CBRN-TIM threat environment: permissive, uncertain, or hostile?
- iii. Establish Common Operational Picture.
- iv. CCTF will request adequate assessment capabilities from one or more troop contributing nations.

6.3.2. **Medical.** Medical actions address the CBRN-TIM effects on both the CTF forces and the civilian population: Triage and diagnosis (including laboratory support), prophylaxis and medical treatment, tracking of symptoms and prophylaxis/treatment, medical facility staffing (including providing required expertise), and preventive medicine. The medical actions also include the patient decontamination efforts required to allow medical personnel to treat, house, and transport patients.

- i. Medical planners must advise operational planners in:
  - i-i. Any quarantine or restriction of movement implemented and in preventing the spread of disease through vaccinations and other forms of prophylaxis.
  - i-ii. Coordination with the affected nation and the IHC (see paragraph 2.3).
  - i-iii. Information operations, as discussed in paragraph 6.2.4.

#### ii. Casualty Management

- ii-i. Identify casualties.
- ii-ii. Provide information on casualties, as appropriate, to participating CTF elements and supported civil authorities and agencies.
- ii-iii. Decontaminate casualties as best possible and as soon as possible.
- ii-iv. Determine whether casualties can be moved outside of the contaminated area for full medical treatment, or whether they pose too serious a risk of spreading contamination. If the latter is true, determine an appropriate level of care for casualties within the contaminated area.
- ii-v. Track the movement of contaminated casualties.

**6.3.3. Hazard Containment and Management.** Prevent the spread of contamination or contact with existing contamination.

- i. Identify and mark contaminated areas/facilities, and control access to these areas. Determine when contamination has weathered or been cleaned to the point that a hazard no longer exists.
  - i-i. Establish cordon requirements.
  - i-ii. Control traffic and movement between contaminated and uncontaminated zones.
  - i-iii. Conduct continuous monitoring.
- ii. Clean contaminated areas and facilities.
  - ii-i. Perform decontamination, sampling, detection, identification, and confirmation.
  - ii-ii. Employ HAZMAT capability, as required.
- iii. Identify contaminated personnel, and prevent them from spreading contamination.
  - iii-i. Conduct decontamination of personnel and confirm that they pose no further threat of spreading the contamination.
  - iii-ii. In the case of contagious diseases, implement quarantine, isolation, and restriction of movement to prevent the spread of disease. Provide mandatory vaccinations and other forms of prophylaxis, as required.

**6.3.4. Transportation and Logistics.** Includes transportation to and from the affected nation(s), transportation within the affected nation(s), maintenance and supplies (including food, water, and energy), and mortuary affairs. Acquire needed local support, including guides and interpreters, facilities to work from,

- i. Coordinate with CTF stakeholders to plan force flow (deployment timeline).
- ii. Establish supply routes, movement corridors, and traffic control measures that avoid spreading contamination or causing additional disruptions to critical services.
- iii. Resource CTF units to execute and sustain transportation.
- iv. Resource CTF units to execute and sustain supply efforts.

**6.3.5. Mortuary Affairs:**

- i-i. Identify remains if possible.
- i-ii. Determine whether remains can be removed from the contaminated area without posing a threat to others. If so, perform the tasks necessary (decontamination) for safe and timely disposition of human remains. If the remains cannot be safely handled, they should be interred in interim locations in the contaminated area that are marked for future processing. Such efforts must be coordinated with the affected nation prior to deployment of CTF for CM operations.
- i-iii. Record and track the disposition and/or movement of contaminated remains.

**6.4. Security.** This effort seeks to provide protection primarily to the response force (including the IHC and affected nation responders) but also to the victims of the CBRN-TIM incident with which it is working.

**6.4.1.** CBRN-TIM protection may be required against residual contamination and against follow-on attack.

- i. Monitoring to detect follow-on CBRN-TIM incidents in order to enable prompt response. Monitoring may include environmental monitoring, medical surveillance, and animal surveillance.

- ii. Provide protection against CBRN-TIM (refer to the CBRN-TIM Defense Annex – Part C, Chapter 9, Annex D).
- iii. Continue to collect and analyze intelligence on potential CBRN-TIM threats in order to enable a continual assessment for the duration of CM operations.

6.4.2. Security may be required against other forms of attack or to restore/maintain order following a CBRN-TIM incident. [Refer to Part C, Chapter 9: Force Protection Annex C](#) and to the [Part D, Chapter 1: Peace Operations](#).

6.4.3. Support and sustain the security efforts.

6.5. **Other HA/DR.** As outlined in paragraph 3.5 Lines of Operation (above), CM operations require HA/DR actions. The affected nation and the IHC have primary responsibility to perform these roles, but the CTF may need to provide HA/DR support based upon the severity of the CBRN-TIM event and its impact upon the affected nation's government, infrastructure, economic framework, and population.

6.5.1. Emergency Support Function (ESF) areas for planning and establishing Measures of Effectiveness (MOE). Identifying MOE for each of these functions will assist in guiding the CM operations mission at the offset toward clearly identified objectives for all parties and also facilitate the transition of responsibility for CM operations from the CTF to the affected nation.

- i. Transportation.
- ii. Communications.
- iii. Public Works and Engineering.
- iv. Firefighting.
- v. Information and Planning.
- vi. Mass Care.
- vii. Resource Support.
- viii. Health and Medical Services.
- ix. Urban Search and Rescue.
- x. HAZMAT.
- xi. Food and water.
- xii. Energy.
- xiii. Housing.

6.5.2. CM operations **do not** attempt to restore the ESF conditions to those that existed prior to the CBRN-TIM incident; rather, the CTF considers these functions in their emergency response actions for mitigating the effects of the CBRN-TIM incident.

## 7. **References.**

7.1. List of publications.

7.1.1. U.S. Joint Publication, Foreign Consequence Management Planning Guide, April 2001.

7.1.2. U.S. CJCSI Military Support to Foreign Consequence Management Operations, March 2006.

7.1.3. U.S. Joint Publication, Joint Tactics, Techniques, and Procedures for Foreign Humanitarian Assistance, August 2001.

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**Appendices.**

Appendix 1: Sequence of Events for Coordination of Foreign CM

## APPENDIX 1

### SEQUENCE OF EVENTS FOR COORDINATION OF FOREIGN CONSEQUENCE MANAGEMENT (CM)

1. **Sequence of Events for Multinational CM Support Request and Support.** Outlined below is a broad overview of the sequence of events for a CM Support Request from the affected nation (AN). This outline addresses the most likely events that will occur following a multinational CM support request. Nations can and do develop contingency plans in anticipation of natural or man made disasters (including CBRN-TIM incidents). This outline represents a generic sequence of events following a nation's request for CM support.
2. **Requesting and Offering CM Assistance.**
  - 2.1. **Affected Nation Response Process**
    - 2.1.1. After a CBRN incident occurs, the AN will execute its emergency plan to coordinate its response to the incident. The AN will characterize the incident and identify critical requirements and response assets. If organic response capabilities are insufficient the AN will first enlist the support of neighboring and/or friendly nations/allies. The AN may also activate Bilateral agreements, approach multinational/international organizations for support, and look to more distant international partners.
    - 2.1.2. Requests for CM support from another government must carry the weight of an official decision and are usually delivered through senior Foreign Affairs representatives (at local Embassies). The AN will send its allies a written request for support which should:
      - i. Characterize the CBRN-TIM incident;
      - ii. Provide precise geographical location and time of the incident in question;
      - iii. Include resource requirements: material, personnel, equipment, pharmaceuticals, or other items needed and the time in which they must be delivered in order to have the maximum effect on mitigating human casualties;
      - iv. Provide a specific description of current response efforts and identify shortfalls where assistance can be effective;
      - v. Provide any other information it deems useful to the requested party in determining an appropriate offer of assistance.
    - 2.1.3. In urgent circumstances an oral request may be made, but shall be confirmed subsequently in writing to include the information listed in 2.1.2 i-v.
      - i. 10 days following the oral request is a reasonable timeframe for the issue of a written request based on current international protocols.
  - 2.2. **Requested Government Response Process**
    - 2.2.1. A request for support is sent to the requested government by the AN. Upon receipt, the requested government begins to internally evaluate the request. The requested government should acknowledge receipt of the request to the AN.
      - i. 4 hours following the receipt of request is a reasonable timeframe for the requested government to acknowledge receipt of the request based on current international protocols.

### 2.3. Submitting an Offer

- 2.3.1. Following acknowledgement of a request for assistance, each requested nation will determine if they have resources to meet the request that can be delivered in time to meet the requirements of the event. The preparation of an effective and coordinated offer of assistance may require additional time and information.
- 2.3.2. Offers of CM response activities will include requirements that must be supported by the requesting (affected) nation such as:
- i. Access to and understanding of distribution centers, warehousing, and local transportation;
  - ii. Understanding the physical site security;
  - iii. Other nations and organizations response activities;
  - iv. Understanding of the existing casualty coordination services;
  - v. Access to and communications with emergency operations center(s);
  - vi. Integration with the local medical and public health infrastructure;
  - vii. Access to the public information systems;
  - viii. Other resources that may be required based upon the situation.
- 2.3.3. Unsolicited offers must be transmitted via competent authorities. Under no circumstances are unsolicited offers to result in the delivery of resources without both a specific request for and acceptance of an offer by the AN.

### 2.4. Replying to Offers of Assistance

- 2.4.1. Due to the additional time required to prepare and transport assistance resources, the AN should respond to the offer from the requested government within four hours of receipt by:
- i. Accepting the offer of assistance;
  - ii. Seeking a modification regarding the offer of assistance;
  - iii. Seeking additional information regarding the offer of assistance;
  - iv. Seeking an extension of time in which to respond in order to reach a more informed decision;
  - v. Rejecting the offer of assistance.

**NOTE:** Where bilateral plans or agreements exist to provide CM support, forces may be dispatched or contingency plans activated prior to the formal request. Nations review the AN CM request with their established crisis action procedures. A strategic assessment is made of the situation.

3. **Movement and Receipt of Assistance.** The steps 3.1-3.6 below may occur sequentially, in parallel, or may be reversed due to the immediacy of the situation and the amount of multinational forces already deployed to the AN.

#### 3.1. Supporting Nations Deploy Initial Assessment Teams (IAT)

- 3.1.1. Nations may deploy respective IAT (made up of State/Foreign Affairs Ministry personnel) to AN Embassy/Foreign Affairs Ministry offices in the AN. These teams will assess the situation and provide recommendations back to the national authorities for each respective nation that has received a formal request for CM support.

- 3.2. Based on the assessment of the IAT, the community of Foreign Affairs agencies will generate requests for support from other agencies.
  - 3.2.1. CTF forces could become involved in this support function through at least two means:
    - i. First responders to an incident may come from CTF forces under the auspices of a commander's immediate response authority;
    - ii. CTF forces may receive CM support tasks through command channels as generated and coordinated by the Foreign Affairs apparatus.
- 3.3. The CTF Commander may deploy a military Strategic Assessment Team (SAT) to augment the IAT and CMST (see below). Or, the SAT could deploy prior to the IAT based upon situational requirements.
- 3.4. Supporting Nations deploy Consequence Management Support Teams (CMST)
  - 3.4.1. CMST are the central civil-military coordinating interface established independently by each nation providing military support to CM operations. The CMSTs coordinate their respective nations' CM response. This is a multi-agency team made up of selected IAT personnel, Theater level CM planners, and CTF liaison and planning teams where appropriate (which may be the advance CTF–CM planners if a coalition CM response is planned). Whether the CTF was already operating in the AN at the time of the incident, or was established as a CTF–CM in response to the incident, the CTF Commander must work closely with the CMSTs from all CTF member nations in order to facilitate the coordination of CTF support for CM operations.
  - 3.4.2. The CMST may operate from several locations. Below are key locations:
    - i. AN Emergency Operations Centers. This is the recommended location for the multinational CM coordination effort
    - ii. Embassy/Foreign Affairs Ministry facilities
    - iii. CTF/CTF--CM
    - iv. Key response locations in the AN
- 3.5. CM Response Plan. Based upon the IAT recommendations, if the CM support request is considered valid, the respective nations' national authorities and State/Foreign Affairs Ministry departments develop a CM response plan in concert with the AN, CMST, CTF Commander, and CTF-CM (if applicable). All departments and agencies having a response capability need to be involved in the development of this plan.
- 3.6. Activation of the CTF–CM and assignment of forces (if applicable). The CTF-CM may be activated if coalition military support is required for the CM support request. In turn, the CTF components are formed, and forces may be assigned or attached. [Refer to Part B, Chapter 2: Command, Control, Coordination and Cooperation Relationships.](#)
  - 3.6.1. [Refer to Part D, Chapter 1: CBRN-TIM Consequence Management](#) for how the CTF–CM may conduct its mission..

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## Annex D

# CHEMICAL, BIOLOGICAL, RADIOLOGICAL, NUCLEAR - TOXIC INDUSTRIAL MATERIAL (CBRN - TIM) DEFENSE

### 1. Purpose

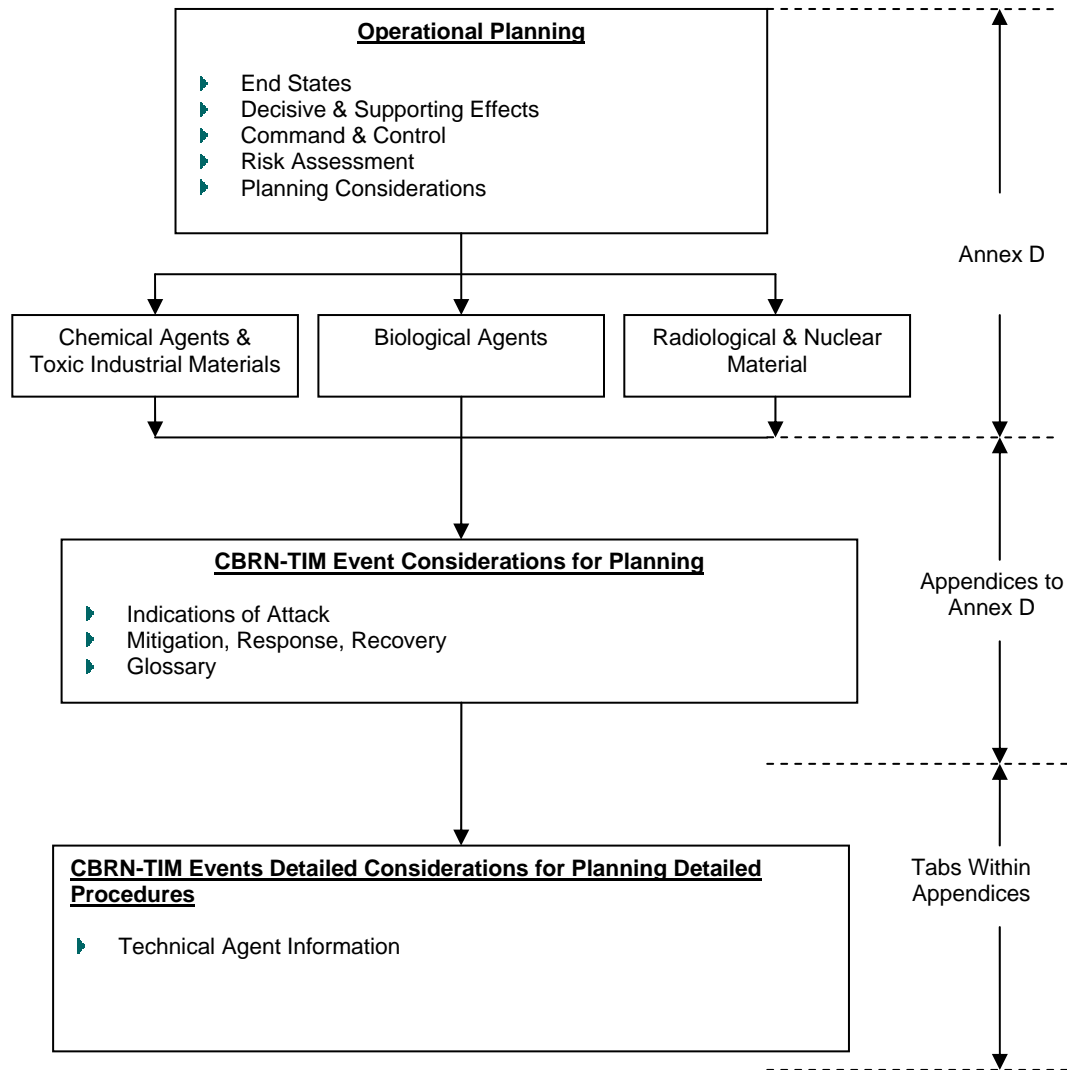
CBRN refers to Chemical, Biological, Radiological and Nuclear weapons. The term CBRN is replacing the outdated NBC (Nuclear, Biological, and Chemical) acronym in many countries and can be said to be a synonym for Weapons of Mass Destruction (WMD). TIM, or Toxic Industrial Materials, refers to any substance that in a given quantity produces a toxic/harmful effect in exposed personnel through inhalation, ingestion, or absorption or other physical contact.

- 1.1. To ensure the Commander, CTF (CCTF) and staff are able to make appropriate risk-based decisions concerning CBRN-TIM force protection actions and mission requirements. This annex describes the rationale and objectives for CBRN-TIM protection, characterizes their threats and recommends procedures for achieving the needed protection.
- 1.2. This annex addresses the use of these hazards by a hostile force (terrorists, conventional military force, etc.) whenever a CTF is operating. This annex also addresses accidental release (e.g., natural disaster, or the accidental release by governmental / commercial sectors).
- 1.3. To clarify that while it is recognized that CBRN-TIM could cause significant numbers of casualties and other disruptive effects, it can cause much broader impacts on CTF operations, with a significant chance of causing mission failure. The CCTF needs to identify CBRN-TIM threats that could impair the mission and protect the forces from these effects. The CCTF must also be prepared to mitigate CBRN-TIM effects should they occur, as addressed in the Consequence Management section ([refer to Part D, Chapter 1: CBRN-TIM Consequence Management](#)).

### 2. Scope

- 2.1. This annex is focused upon the force protection actions and changes in the character of operations that CBRN-TIM may impose on CTF forces and multinational organizations.
- 2.2. This annex includes the CBRN-TIM assessment process, prevention and an overview of mitigation and response. This Annex does NOT address Consequence Management (actions taken to maintain or restore essential services and manage and mitigate problems resulting from disasters and catastrophes, including natural, manmade, or terrorist incidents) which is a primary mission area for the CTF command. [Refer to: Part D, Chapter 1: CBRN-TIM Consequence Management.](#)
- 2.3. [Refer to Part C, Chapter 8: CBRN-Tim Defense Special Staff](#) for the recommended CBRN-TIM Defense Special Staff for a CTF headquarters and their respective roles and responsibilities.

3. **How to Use This Annex.** This Annex is designed to serve as a tool to support command decisions concerning CBRN-TIM threats. General facts and references can be found in are in the main annex while corresponding details are in the appendices and tabs to this Annex.



**Figure C-9-D.1: Annex Functional Flowchart**

**4. Operational End States.**

4.1. Relative to the CTF mission and CBRN-TIM threats

- 4.1.1. The CTF is capable of addressing CBRN-TIM threats with no significant impact on mission execution; or
- 4.1.2. CTF planning and operations are adjusted to mitigate CBRN-TIM risks, and the CCTF acknowledges the CBRN-TIM risks in executing the mission; or
- 4.1.3. CCTF recommends the mission be redefined based on the assessed CBRN-TIM threat and the means available to mitigate the threat to CTF forces and multinational participants.

4.2. Relative to personnel

- 4.2.1. CCTF is ready to mitigate CBRN-TIM threats to an acceptable level of risk and in accordance with the stated policies of participating nations.

4.2.2. CCTF accepts CBRN-TIM risks that he cannot mitigate or chooses not to mitigate.

**5. Decisive Points (DP – Overriding Conditions) and Supportive Effects (SEs).**

5.1. DP #1: The missions of CTF forces and Multinational response suffer no significant disruption from CBRN-TIM events.

5.1.1. SE #1: Casualties in CTF forces and in the Multinational response are minimized.

5.1.2. SE #2: Loss of operating areas is minimized.

5.1.3. SE #3: Host nation support and stability has been sustained.

5.1.4. SE #4: Participating nations’ support has been sustained.

5.1.5. SE #5. International community perceives CBRN-TIM use is ineffective because attacks can be prevented, the attack effects (including psychological effects) can be largely prevented, and/or the effects which do occur can be promptly and significantly mitigated.

5.2. DP #2: The international community views the threat and use of CBRN-TIM as illegitimate.

5.2.1. SE #1. Community perceives a multinational response is legitimate, required and effective.

5.2.2. SE #2. Threat or use of CBRN-TIM is seen as illegal in accordance with international law.

5.2.3. SE #3. Threats to forces by CBRN-TIM are condemned by the international community.

5.2.4. SE #4. International and local media are supportive of the CTF mission and multinational efforts, and condemn threat to forces by CBRN-TIM as illegal and immoral acts.

5.2.5. SE #5. Host nation population does not support the use of CBRN-TIM by hostile forces

**6. Planning for the CBRN-TIM Incident.** The CBRN-TIM defense concepts of operations model is based on a relationship between the following conceptual aspects of a CBRN-TIM incident: Situation, Hazard, Event, Damage, and Impact. The concept defines a logical progression from one to another—the hazard evolves from the situation, the event from the hazard, and damage and impact are results of the event. This logical progression of hazards emerging from the situation to ultimately having impact is referred to as the CBRN-TIM Incident Cycle, as shown in Figure C-9-D.2 where:



**Figure C-9-D.2: CBRN-TIM Incident Cycle**

6.1. Situation is characterized by the force and the capabilities that are available to accomplish a mission.

- 6.2. Hazard is defined as a natural or manmade phenomenon that has the potential to adversely affect human health, property, activity, and/or environment.
- 6.3. Event is defined as the realization or delivery of a hazard at a defined location(s) in time-space with respect to a targeted unit or analysis area.
- 6.4. Damage is generally defined as harm or injury impairing the value or usefulness of something, or the health or normal function of persons. For the purpose of this document, damage will be more specifically defined as the aggregate of the casualty or personnel loss of the force in terms of increased morbidity and mortality (the number of estimated casualties and fatalities).
- 6.5. Impact is a judgment or assessment of the effects of damage upon the force's mission or capabilities
7. **Effective CBRN-TIM defense** involves adequately intervening in the transitions between the states of Situation, Hazard, Event, and Damage so as to reduce or eliminate the impact of the CBRN-TIM incident. Most CBRN-TIM incidents will involve multiple interventions, and the execution of some interventions may be concurrent. Impact assessment consists of an estimate of the damage from an event, modified by the organic capabilities within the force to operationally manage the risk from hazards; prevent the event; mitigate the damage; and respond to the damage. Reducing the impact of a CBRN-TIM incident requires enhancing or developing these capabilities.
8. **Interventions.** Interventions are defined as follows:
- 8.1. Risk Assessment: Risk Assessment activities include the analysis of potential CBRN-TIM incident cycles based upon the identification of hazards in the Area of Operations (AO) including CBRN-TIM threats. These activities include decisions concerning the strategic and operational mix of required capabilities.
- 8.2. Prevention: Prevention activities are undertaken prior to the event. These activities prevent the delivery or release of the hazard and/or prevent the consequences of the event. WMD elimination activities, interdiction of the use of WMD, and counter-proliferation activities are examples of Prevention interventions.
- 8.3. Mitigation: Mitigation activities are undertaken before and/or after the event occurs. These activities prevent, eliminate, or reduce the impact of a CBRN-TIM incident. Examples of mitigation include medical protection, physical protection, and restriction of movement.
- 8.4. Response: Response activities are undertaken after the damage occurs. These activities prevent, eliminate, or reduce the impact of the damage from a CBRN-TIM incident. Examples of response include combat casualty care and medical evacuation.
- 8.5. Recovery: Recovery activities are undertaken after the impact of the incident is realized. These activities restore full operational capability. A change in capabilities realized during the Recovery intervention results in a Situation state with different characteristics than the initial Situation state.
9. **Risk Assessment.** The CBRN-TIM Risk Assessment process consists of a methodical, disciplined process of defining the operational situation, potential hazards, possible events and estimating the resulting damage and impact of those events. For those events that are both likely and/or high in impact, contingency plans outlining the measures necessary to minimize the impact will be developed. Risk assessment involves the following:
- 9.1. Analysis of situation. In the CBRN-TIM Incident Cycle, the Situation state is characterized by the attributes of the following:
- 9.1.1. The population. Must specify all of the relevant populations such as: coalition forces; contract support; host nation support; NGOs, IOs, humanitarian organizations, and the ICRC.
- 9.1.2. The CBRN-TIM capabilities that the force can apply to accomplish its mission
- 9.1.3. The population may be dynamic in different operational phases of a mission, and the values of its attributes may vary significantly in that case. The attributes of the population are as follows:
- i. Count (the number of people)

ii. Location

iii. Size of the physical area (covered by the population)

iv. Changes in the location and density of personnel in the Population at Risk (PAR)

9.2. Analysis of hazards. Hazards are characterized by the following:

9.2.1. Lethality: The ability of an agent to cause death without treatment.

9.2.2. Morbidity: The severity and duration of health effects.

9.2.3. Effective Dose: Quantity of the agent required to infect or intoxicate an exposed individual.

9.2.4. Toxicity: The speed with an effective dose causes lethality and morbidity.

9.2.5. Communicability: The ability of the agent to cause secondary cases.

9.2.6. Persistence: The period during which the agent remains a hazard to personnel or equipment

9.2.7. Acute exposure: Exposure during a short period.

9.2.8. Chronic exposure: Repeated exposure over a longer period. For those agents that cannot be easily cleared or metabolized by the body, chronic exposure may be additive toward an effective dose.

9.2.9. Long term health effects: Ability of an agent to cause lethality or morbidity over time periods exceeding mission duration.

9.3. Analysis of Event. All events, regardless of their nature, can be defined in terms of specific attributes that describe the event and facilitate comparison between events. These attributes are:

9.3.1. Target Unit: An entity that is affected by the event and defined in terms of its population, operational area, and population distribution.

9.3.2. Attack: Exposure of a target unit to a quantity of CBRN-TIM hazard delivered by a specific means.

9.3.3. Onset (of the event): Presentation of the event in time. Sudden onset events include those with onsets lasting seconds to hours; gradual onset events have an onset over days to weeks; delayed onset events occur some time after the discovery of the likelihood that the hazard will become realized.

9.3.4. Duration: The length of time of events, which may be brief, short, intermediate, or prolonged. Events of brief duration last only seconds to minutes (and correspond usually to a sudden mode of onset); short duration events continue in some form, for hours to days. Intermediate duration events (such as epidemics and toxic contamination) may last days to weeks. Events that last for prolonged periods include epidemics, nuclear/radiological contamination, etc.

9.3.5. Type: All events can be classified into one of three main types: natural, manmade, or mixed (natural and manmade). CBRN-TIM events are considered manmade events and are further subtyped into the following categories.

i. Explosive release: Detonation of highly energetic material which may be accompanied by a substance release.

ii. Substance release: A non-explosive release of any CBRN-TIM hazard, such as a spray delivery of biological or chemical agents.

iii. Distribution System release: The release of material using one of the societal infrastructure systems to spread the substance, such as communication systems (postal system) or transportation system (subway).

9.4. Targets. Potential targets for an CBRN-TIM attack include the following:

- 9.4.1. Military target/unit
- 9.4.2. Large population centers
- 9.4.3. High density population centers (e.g., stadiums, malls, etc)
- 9.4.4. Industrial facilities
- 9.4.5. Industrial transportation systems
- 9.4.6. Water distribution systems
- 9.4.7. Food distribution systems
- 9.4.8. Key Facilities

9.5. Agent Distribution Systems. Agents can be dispersed through the following means: atmosphere; building ventilation systems, disease vectors, physical contact, food, and water.

9.6. Analysis of Damage. All damage, regardless of its nature, can be defined in terms of specific characteristics that describe the damage and facilitate comparison between events. These characteristics are:

- 9.6.1. Type: For this risk assessment, types of damage are described as casualties, asset degradation, and terrain denial.
- 9.6.2. Magnitude: Number of casualties, area denied, and physical destruction.
- 9.6.3. Onset & Duration of Damage: Onset of the damage refers to the time interval between the attack (the release of the agent) and the manifestation of the effects. The length of time the damage persists is the duration

10. **Estimate of Impact.** Impact is defined in terms of the nature and duration of casualties, terrain denial, and asset degradation with respect to the organic capabilities necessary for the smooth conduct of operations. There are four levels of impact.

- 10.1. Level I: will cause mission failure
- 10.2. Level II: may serious impact, mission failure is very likely
- 10.3. Level III: some impact, may cause mission failure
- 10.4. Level IV: minimal effect on mission success

11. **Probability Assessment.** The CBRN-TIM risk assessment process is based upon the operational risk management concept in which the mishap probability is integrated with the hazard severity (or impact, as defined above in paragraph 7.5) to provide an overall ranking of risk, as follows.

11.1. Mishap Probability. Has four levels:

- 11.1.1. Level A: very likely to occur during the operation
- 11.1.2. Level B: probably will occur during the operation
- 11.1.3. Level C: could occur during the operation
- 11.1.4. Level D: unlikely to occur during the operation

12. Then the overall risk assessment can be determined using the following operational risk matrix:

		Event Probability			
		A	B	C	D
Impact	I	1	1	2	3
	II	1	2	3	4
	III	2	3	4	5
	IV	3	4	5	5

**Risk Assessment Matrix**

The Risk Assessment Matrix yields an overall “risk assessment code” (RAC):

1. Critical
2. Serious
3. Moderate
4. Minor
5. Negligible

RACs can then be used to prioritize hazards to the CTF. For those threats that yield a RAC of 1 or 2, commanders and planners should either take action to mitigate the impact (I, II, III, or IV) of the potential event and/or to reduce the probability of the event (A, B, C, D) in order to reduce the overall level of risk.

This additional planning should include, at a minimum, the following:

- Protective actions required prior to event (soldiers might be required to carry IPE on them, because onset of event may be too sudden to allow access to stockpiles; training).
- Actions to prevent the event, if possible (placing of security guards, securing facilities, etc)
- Defined mechanism for detection, alarm, and reporting of the event (use of NBC detectors, warning sirens, reconnaissance, etc)
- Immediate protective actions for coalition forces (such as donning protective equipment, evacuation, etc) and appropriate level of MOPP, if applicable.
- Contingency plans to ensure continuity of operations (logistical re-supply, re-location of forces, etc)
- Defined triggers for return to normal operations

vcvccvcvc vv v vc c

cvbnm. M., **Figure H-3: Risk Assessment Matrix and Planning Considerations**

### 13. Command and Control

13.1. Overview. The CTF CBRN-TIM cell is a component of the CTF Special Staff (when developed) and serves as the subject matter expert and advisor to the CCTF and Staff. The CBRN-TIM Special Staff cell consists of a CBRN-TIM Defense Director and supporting staff with expertise dependent on the threat and situation. If the CTF does not have CBRN trained staff available, the CTF shall request personnel from an appropriate nation's CBRN components/agencies. Reach back support should be exploited to the greatest extent possible. Refer to the CBRN-TIM Defense Special Staff Annex ([Refer to Part C, Chapter 8](#)) for organization, roles and responsibilities, and reporting procedures for the CCTF.

### 14. CBRN Reporting

14.1. The Automated Coalition Consequence Management (ACCM) system will be utilized by the CBRN-TIM Special Staff to:

- 14.1.1. Determine and assess the operational effects and impacts of CBRN-TIM hazards on operations.
- 14.1.2. Develop CBRN-TIM plans to include resource allocation and medical support.

14.1.3. Access real time CBRN-TIM data and hazards predictions by integrating with, making use of, and federating with transport and dispersion and hazard information systems and modeling.

14.2. CBRN Alarms and Warning System will be utilized at the tactical level.

- i-i. The NBC Warning and Reporting System (NBCWRS) is the primary means of transmitting operational CBRN reports.
- i-ii. Enemy first use of CBRN weapons will be transmitted using an initial NBC-1 report. This report will be sent to the CTF using FLASH precedence. Subsequent reports of CBRN attacks will be transmitted in a CBRN-2 or CBRN-3 format using immediate precedence.
- i-iii. The CTF NBCWRS is an area reporting system. All units operating within the geographical confines of a major subordinate command's area will expeditiously report CBRN attacks through channels. Once received, the component will forward the evaluated report to the CTF C3. This does not preclude the requirement of the reporting unit notifying its next higher headquarters.
- i-iv. Units operating in another unit's area, in support or nonaligned, must integrate into the NBCWRS of the unit exercising control of that area. This does not preclude the requirement of higher headquarters notification.
- i-v. Units located in the CTF rear area will report CBRN activity through base and base cluster channels to the designated rear area operations center that will then forward the information to the CTF C3.
- i-vi. Evacuation of casualties can spread contamination to clean medical treatment facilities. Therefore, all casualties must be decontaminated as far forward as the situation permits IAW component doctrine.
- ii. Reports. Standardized NBCWRS reports are directed following the Reports Matrix (refer to Figure C-9-D.4):
  - ii-i. A NBC Strike Serial Numbers. Components will assign a five-character code as the strike serial number to each NBC strike received. The method for assigning these numbers is as follows:
  - ii-ii. The first character identifies the component reporting the attack. The letter A designates ARFOR, F denote AFFOR, M designates MARFOR and N denotes NAVFOR (to include the Coast Guard). This character reflects the component in whose sector the attack took place vice the specific unit affected. These codes are for "service components". The exact coding will have to be designated early on.
  - ii-iii. The next three characters identify the sequential number of the attack against the component.
  - ii-iv. The final character identifies the type of attack: N for Nuclear, B for Biological and C for Chemical.
  - ii-v. For example, strike serial number A001C is the first chemical strike reported in the ARFOR sector.

REPORTS MATRIX				
REPORT TITLE	SUBMITTED BY	TRANSMIT TIME	ACTION ADDRESSEE	ADDITIONAL ADDRESSEE
NBC – 1 (INITIAL)	Observing Unit See Note 1	As Required	CTF C3	Higher Adjacent
NBC 2 – 6	Subordinate Components	As Required	CTF C3	Adjacent
Chemical Downwind Message Note 2	Subordinate Components	0500 1100 1700 2300	MSC	Adjacent Subordinate Commands
Effective Downwind Message Note 2	Components	1100 2300	MSC	Adjacent Subordinate Commands
Note 1 – Initial enemy attack only. Use FLASH precedence and transmit to CTF J3				
Note 2 – Due to differences in local weather data, component weather officers will use local data generated by their weather office to prepare CDM and EDM. A copy will be transmitted to the CTF J3 with the component NBC situation report.				

**Figure C-9-D.4: CBRN-TIM Reports Matrix**

**15. Planning Considerations**

**15.1. Importance of Multinational CBRN-TIM Force Protection Planning.** Given current regional and international threat assessments, the CCTF, participating nations in the CTF command, and CTF Component Commanders must place special emphasis on CBRN-TIM force protection planning early on in mission analysis and then continuously throughout the mission. Without adequate threat analysis, risk assessment, contingency planning, and deliberate force protection actions, the impact of even minor CBRN-TIM events could have overwhelming negative impacts on CTF mission execution and participating nation support of the CTF mission - potentially causing total mission failure.

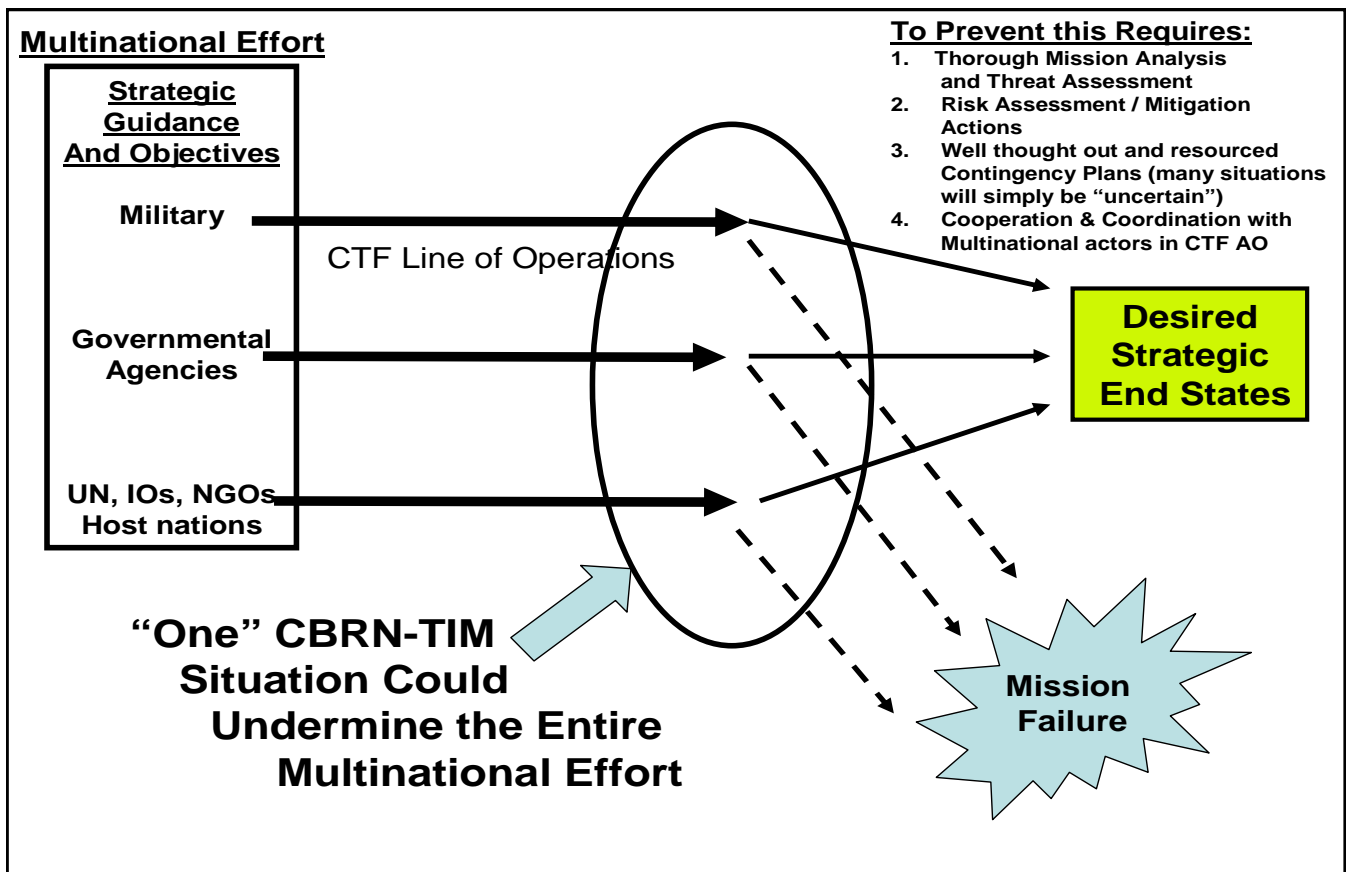


Figure C-9-D.5: Importance of Multinational CBRN-TIM Force Protection Planning

## 15.2. Potential impacts to mission execution.

### 15.2.1. CBRN-TIM may cause casualties and psychological impact.

- Casualties and psychological effects could reduce CTF force and multinational participant capabilities to the point where the mission is impaired or infeasible.
- Casualties and other effects may redefine the mission to include CBRN-TIM consequence management.
- Casualties may affect public opinion and may likely drive undesirable international consequences, directly impacting the willingness to participate in or be the beneficiary of the operation.
- May likely cause local mass panic, impacting economic, physical, and social infrastructure in a wider region, adversely affecting mission execution.
- The psychological impact of exposure to substances that cause long term health effects should not be discounted, e.g., carcinogens, teratogens, etc.

### 15.2.2. CBRN-TIM could deny the use of key facilities and areas.

### 15.2.3. CBRN-TIM events or threats may undermine support for the CTF among participating nations or impair their ability to participate.

- Could negatively affect host nation support.

15.2.4. CBRN-TIM events or threats may escalate conflict, requiring a major shift in responsibilities for command and control of multinational operations, requiring transition planning and coordination (e.g., an UN-led operation transitions to a Lead-Nation operation), and contingency planning of potential situations.

### 15.3. Challenges of Multinational CBRN-TIM force protection.

15.3.1. Most multinational forces and organizations are not prepared to operate in a CBRN-TIM environment.

- i. There may be CBRN-TIM situations in which existing response capabilities inadequately mitigate risk, requiring specialized capabilities or alternative operational concepts.
- ii. Most multinational military forces have limited capability to operate in a CBRN-TIM environment.

15.3.2. The medical risks of CBRN-TIM are not fully understood or described. This is especially true for long-term health effects.

- i. This means that before the operation, the complete scope of hazards from CBRN-TIM attacks may be ill-defined.
- ii. Post attack, CCTF ability to project the residual risk and predict the operational impact will be limited.

15.3.3. UN, International Organizations (IOs), Non-governmental Organizations (NGOs), Host Nation personnel and civilians, and supporting / involved civilians are not prepared to survive and operate in a CBRN-TIM environment.

- i. Preparing personnel to survive and operate in a CBRN-TIM environment is usually not as simple as giving them a mask or a suit. Real protection involves training and other forms of preparation that usually require time and focus.
- ii. Inconsistency in existing policies, doctrine, standards (e.g., STANAGs), deliberate plans, and capabilities to survive and operate in a CBRN-TIM environment, plus several gaps in these areas, significantly increase risk in CTF CBRN-TIM planning and execution.
- iii. Complete baseline environmental hazard information (see Operational Intelligence Preparation of Environment – OIPE) does not exist, and the information that exists may not be readily accessible to CTF planners. Further, this information is not currently addressed by the CCTF within his mission analysis. Integration of this information into the OIPE would allow informed risk decisions on the crisis system to be made by the CCTF and participating nations.

15.3.4. CBRN-TIM Concepts of Operations (CONOPS) and understanding of agents' effects on personnel and equipment, including the persistency of threat agents, is limited and varies greatly depending on the agent and many environmental and operational factors.

- i. CTF forces can survive and operate in some categories of CBRN-TIM environments.
- ii. CTF forces would operate in some CBRN-TIM environments with significant uncertainty of the threat and its effects, and may need to adjust their operations to hedge against CBRN-TIM risks.
- iii. There is no single solution in protective equipment that protects against all CBRN-TIM compounds. Protective clothing and protective posture must be tailored to the actual/anticipated threat agents.

### 15.4. Developing Mitigation and Response Plans

15.4.1. Conduct threat assessment. A broad analysis of all potential CBRN-TIM threats is required prior to conducting Risk Assessment. This not only include WMDs intentional used by enemy forces but also nuclear plants, chemical plants, pharmaceutical plants, and naturally occurring infectious diseases for example.

- i. Conduct Operational Risk assessment in accordance with Section 7 of this Annex. What are the risks (consequence and likelihood) to the mission and the multinational participants from CBRN-TIM, given the overall level of uncertainty? Estimate the most significant risks to the mission and prioritize them

#### 15.4.2. Mitigation and Response Plans:

- i. Risk Assessment Code (RAC) 1 or 2. This is a high-risk CBRN-TIM environment and adjustments to the operational plan in order to decrease the risk/impact of CBRN-TIM are critical to mission accomplishment. It is paramount that such plans be coordinated to the maximum extent possible (given operational security needs) with UN, IOs, NGOs, Host Nation, and other civilian-military elements.
- ii. RAC 3. Contingency plans should be developed although implementation is at the discretion of the CCTF.
- iii. RAC 4 or 5. Contingency mitigation and response plans are recommended but not required.

#### 15.4.3. Identify Specific Requirements for CBRN-TIM Force Protection Based upon Threat Assessment: These requirements include forces, subject matter expertise/teams and specialized equipment, training, facilities, CONOPs, Information Management (IM) plan/procedures, CBRN-TIM decision support tools. Ideally, a certification procedure should be established to define personnel and groups prepared to operate in a CBRN-TIM environment.

- i. There is a large body of information and experience in the international community on CBRN-TIM events that should be reviewed to effectively plan a mission, and incorporated to execute a mission.
- ii. For uncertain and non-permissive environments, participating nations should provide at least one CBRN-TIM expert to supplement the CCTF CBRN-TIM planning team and serve as a liaison.

#### 15.4.4. Identify CBRN-TIM policy and procedural shortfalls. Request guidance to address these shortfalls. It is difficult to identify a full list of these shortfalls without some form of exercise to simulate CBRN-TIM use and test policies and procedures. Once identified, these need to be worked through the CNCC and CMOC.

### 15.5. Policy and procedure shortfalls that may require deliberate decisions to establish interim direction/guidance.

#### 15.5.1. Movement of contaminated/infected or potentially contaminated/infected equipment and personnel. Extreme care needs to be taken to prevent the spread on contamination/infection that could cause further casualties and create panic due to the CBRN-TIM threat.

- i. Decontamination/cleanliness/verification standards and transportation procedures and policies generally have not been adequately defined for national use, and international standards do not exist.
  - i-i. Operational (intra-theater is executable, international is not).
  - i-ii. Occupational (CBR warfare agents – no accepted agreement).
- ii. Force flow and RSOI to partners is generally not affected—the contamination is usually located in the theater (and thus is a retrograde issue). However, lift aircraft and ships must often be reused, and their crews must make many trips, so contamination standards and procedures are important in these areas for force flow, RSOI.
- iii. Retrograde policies for equipment during the conflict (especially lift aircraft and equipment needing repairs). Generally will need interim policies and procedures given the lack of established policies and procedures. The policies and procedures used against the foot and mouth disease in Europe in 2001 form a reasonable starting place.
- iv. Retrograde policies for people. People can usually be decontaminated from chemical exposures. But if they have been exposed to contagious biological weapons, it may not be possible to know until they become symptomatic. Therefore, if BW has been used or if it is a threat, personnel may need to go

through quarantine or very tight monitoring during retrograde. If they become symptomatic, they may need to be isolated. See the BW appendix.

- v. Transload issues (coordination points and handling procedures). To avoid exposing some aircraft and personnel, transload location may be established for lift aircraft and ships. Aircraft coming from countries without contamination would fly to these transload bases, transfer people and cargo to aircraft/ships which have been to the contaminated countries, and accept for return people/cargo which have been decontaminated and/or quarantined.
- vi. Retrograde policies for equipment (post-conflict return to participating nations and release from CTF control). These returns require application of civilian standards to decontamination, standards which are normally far more rigorous than operational decontamination standards. These standards need to be identified, and normally civilian detection means must be employed to measure against these standards, as normal military detection devices are not sufficiently sensitive.

15.5.2. Mass casualty management. The CTF needs to have policies for managing mass casualties caused by CBRN-TIM. When mass casualty events occur, it may be impossible to provide all of them with appropriate medical care, including access to physicians, medical treatment, etc. Rules for prioritizing the CTF medical care need to be developed for a mass casualty environment, and rules are also needed for evacuating people so that they can receive appropriate care, though this is complicated by the potential to spread CBRN-TIM contamination.

15.5.3. Movement of contaminated and potentially contaminated remains. Although ordinarily a national responsibility, a CBRN-TIM event may complicate mortuary affairs by, for example, introducing transborder or transportation concerns.

- i. Where religion and tradition permit, it is best to cremate remains.
- ii. If this is not possible, human remains must be decontaminated soon after death and before further processing or transportation. This is not possible for many CBRN-TIM agents.
- iii. If there is any chance that a contagious biological agent has been used, the CCTF should normally intern remains locally as an expedient measure, and wait to resolve these remains until the existing crisis is concluded.
- iv. See Mortuary Annex to refer to additional detail.

15.5.4. Clinical and environmental sample analysis.

- i. Identification to initiate immediate medical actions: The first indication of a CBRN-TIM incident may come from medical observation of casualties. For example, prompt assessment of BW-related samples is required to determine whether an event has occurred and what has been released.
- ii. Air transportation (crossing international boundaries, cargo marking/handling issues). Some procedures for international transport of potential CBRN-TIM samples exist, but in other cases, procedures will need to be developed and confirmed with the nations involved.

15.5.5. Sharing/integration of protective measures, technology and information. Many of the national participants will not have adequate measures for operating in a CBRN-TIM environment, and will likely request assistance and capabilities from the CCTF. See the appendices for more detail. These include:

- i. Protective equipment
- ii. Detection capabilities
- iii. Laboratory support
- iv. Decontamination capabilities
- v. Decision support capabilities

- v-i. Information management
- v-ii. Modeling
- v-iii. Subject matter expertise
- vi. Medical capabilities
  - vi-i. Intensive care and chronic care capabilities
  - vi-ii. Vaccines
  - vi-iii. Prophylaxis
- vii. Sustainment issues
  - vii-i. Prioritization
  - vii-ii. Resourcing levels

15.6. **CTF operational stages relative to CBRN-TIM defense.** The CTF needs to consider five operational stages. The CTF can be activated and execute CBRN-TIM planning within any of these stages. Within each of these stages, the actions to be taken have differing importance. The stages are:

15.6.1. Peacetime Preparation: Likely work done by functional lead countries.

15.6.2. Crisis Action Response Preparation: When preparing to deploy, update previous preparations and choose CONOPs.

15.6.3. Permissive Threat Situation - Operations, no CBRN-TIM threats/use: Decide how much risk to accept.

15.6.4. Uncertain Threat Situation - Operations under CBRN-TIM threats: Seek to deter, prepare to defeat, and adjust plans.

15.6.5. Hostile Threat Situation - Operations after CBRN-TIM use: CM, try to defeat, while seeking deterrence.

Task Category	Importance by Stage*				
	Peace	Preparation	Permissive	Uncertain	Hostile
Assess needs, capabilities	Focus	Focus	Support	Support	Support
Prepare forces	Support	Focus	Support	Support	Support
Deploy capabilities	?	Focus	Support	Support	Support
Secure TIMs		?	Focus	Focus	Focus
Monitor CBRN-TIM			Support	Focus	Focus
Passive defenses			?	Focus	Focus
Active defenses				Support	Focus
Elimination				?	Focus
Care, management of CTF casualties					Focus
Restriction of movement				Support	Focus
Restoration					Focus
Mortuary affairs					Focus
Strategic communications			Support	Support	Focus
Logistics, support	Support	Support	Support	Support	Focus

\*Focus: A major concern; Support: A supporting concern.

**Figure C-9-D.6: Desired Effects by Operational Stage**

## 16. Chemical and TIM Planning Considerations.

16.1. Especially in regard to TIMs, the CBRN Defense Officer should have identified all potential locations and patterns of distribution prior to commitment of the force and made recommendations to the CCTF on whether the CCTF needs to enhance security at any of these facilities.

### 16.2. Detection.

16.2.1. Medical surveillance. Unusual symptoms and/or unusually high numbers of medical cases may be indicative of chemical attacks or TIMs exposure.

16.2.2. Chemical collectors and sensors. Optimal placement and use of these devices must be carefully planned to best mitigate chemical risk to forces. Detection of chemical weapons is usually prompt, while TIMs detection may be more problematic without specialized equipment not typically assigned to deployed military forces. Sensors are designed to notify the presence of high levels (effective dose in an acute exposure) of chemical agents and some types of TIMs. Sensors may not notify of low level contamination by chemical agents and TIMs.

16.2.3. Environmental surveillance. If military forces properly use CW detection equipment, the likelihood of an initial detection via environmental surveillance is high. However, the signs and symptom of chemical poisoning in CTF forces may likely be the initial indication of chemical agents. In addition, the sudden appearance of large numbers of sick or dead animals may be indicative of chemical agents.

16.3. Identification. With this information, the CCTF can initiate a limited set of responses (e.g. increasing the Force Protection Condition levels). Identification of suspected chemical agents is ideally conducted locally if appropriate assets are available. This allows for more rapid decision making. If appropriate technical/medical means are available, samples may be taken, transported to laboratories in other locations, and analyzed in order to confirm identity of suspected agent. Transport and analysis of suspected chemical agents out of theater will normally take a significant amount of time. In that case, decisions will need to be made based on incomplete or imperfect information.

16.4. Confirmation. Confirmation allows commanders to maintain, increase or decrease protective measures. In general, two different approved laboratory test methodologies are required for confirmation. Close coordination with strategic commanders regarding the movement and sharing of samples amongst coalition partners is required.

16.5. Assessment. Key questions to be asked in the assessment phase include, but are not limited to:

16.5.1. HAZARD

- i. What is the presumptive/confirmed chemical agent? Is the agent presumed to be TIMs or traditional chemical warfare agents?
  - i-i. What are the physical characteristics of the agent? Liquid or vapor at point of dissemination? Heavier or lighter than air? Persistent or readily evaporated to biologically insignificant levels in a fairly short period of time?
- ii. What tests and assessments have been done to determine the agents, i.e., what confidence do we have that the event is not the result of more than one chemical agent?
- iii. Do signs and symptoms in CTF forces correlate to detector indications?
- iv. With persistent agents, who has been in the area since the agent was released?

16.5.2. EVENT

- i. Is the event presumed to be the result of a deliberate attack or an accidental release?
- ii. What areas are estimated to be contaminated with agent and how readily will this agent naturally degrade or dilute to biologically insignificant levels?
- iii. How many CTF forces were affected?
- iv. Who was in the area when the release took place and who is estimated to have been exposed to the agent?
- v. When was the event estimated to have taken place?

16.5.3. DAMAGE

- i. What is the range of physical or psychological effects of the confirmed or suspected chemical agent?
- ii. What are the collateral effects on the operational environment?
- iii. What scale of response will be required?
- iv. What individual protective equipment (IPE) is effective against the confirmed or suspected chemical agent and does the CTF have sufficient amounts of these protective equipments available?
- v. How long is this IPE estimated to provide adequate protection against the agent (Protective suit service life? Breakthrough time for respirator cartridges?)
- vi. How long can CTF forces remain in IPE in the ambient environment?

16.5.4. Estimate the IMPACT on the mission.

- i. Will the mission be interrupted for some period of time?
- ii. Can the mission be accomplished in a manner which mitigates the effects of the chemical agent?

- 16.6. Attribution. Every effort should be made to capture the attacker, as this individual or these individuals give a better chance of achieving attribution. Rapid detection of chemical attack should make this possible if procedures are in place to find and pursue the attacker; the latter effort will often require host nation assistance. Chemical samples should be collected and maintained as criminal evidence. To contribute to the attribution and criminal investigation process, CCTF should anticipate providing multiple samples to coalition partners as well as independent third parties. As part of this process, a positive chain of custody to prevent tampering with samples must be established.
- 16.7. Prophylaxis and antidotes. Prophylaxes are medical actions to prevent the development of symptoms and antidotes are medications taken after exposure to counteract the effects of nerve agents. For chemical nerve agents, the only pre-exposure prophylaxis is PB tablets. Atropine and 2-pam chloride are the commonly used antidotes for commonly used nerve agents.
- 16.8. Physical Protection. Required capabilities to survive and operate in a chemical environment.
- 16.8.1. Individual protection. Most chemical agents are inhalation hazards; some are contact hazards. Protective masks are very specialized and may not protect across the entire range of possible C-TIM compounds. Mission-oriented protective posture (MOPP) suits are effective against the vapor hazards of some C-TIM compounds but not against most contact hazards. Self-contained protective equipment (e.g., suits with battery-powered positive pressure purified air or self contained air) will severely limit military operations and are not typically assigned to deployed military assets. Military protective equipment is generally effective against chemical weapon vapors, but is not optimized to provide protection against most TIMs or contact with liquid chemical weapon agents. For protection against most TIMs, commercial/civilian Hazardous Material (HAZMAT) equipment may be required.
- 16.8.2. Collective protection. The number and types of collective protection shelters that are available for rapid deployment is extremely limited. The CCTF should avoid operating in contaminated areas to the greatest extent possible. Sheltering in place is a form of collective protection that provides a lesser degree of protection from contaminated air. It consists of remaining in a building or enclosed shelter with the windows and doors sealed to prevent the ingress of contaminated air.
- 16.9. Active Defenses. Active defenses can often be more successful in stopping chemical and TIM damage than passive defenses—these defenses may be able to prevent a successful attack. Chemical agents can be delivered with ballistic missiles, aircraft, vehicles (especially tanker trucks) and ships. Active defense requires the interception of these deliveries, including the use of ballistic missile defenses, air defenses, and counter-terrorist defenses. In uncertain or hostile situations, the CCTF should seek to acquire such defenses and employ them around likely targets to prevent chemical delivery or the spilling of TIMs.
- 16.10. CW Elimination. Another means of preventing attack is to eliminate the chemical weapon stocks available to an adversary. With adequate intelligence, this can be done with standoff attacks, though such actions normally go beyond the mandate of the CCTF. The CCTF may also seek to capture adversary chemical weapon stocks; again if such actions are within the mission scope he has been given.
- 16.11. Care and Management of Casualties. Planning must determine the capabilities and capacities of treatment facilities in the AO and where projected cases exceed in-theatre treatment capacity, CCTF must be prepared to develop a logistics support plan to include replacement of casualties.
- 16.11.1. Decontamination. Evacuation of chemical agent casualties can spread contamination to clean medical treatment facilities. Therefore, all casualties must be decontaminated as far forward as the situation permits.
- 16.11.2. CCTF should seek clear and effective policies from participating nations outlining the obligation to provide medical support (to include a definition of acceptable standards of care) to civilians in the AO.
- 16.11.3. See Medical Annex to refer to additional detail.
- 16.12. Restriction of Movement (Cordon). CCTF must identify the contaminated area and take measures to prevent the spread of contamination by restricting movement into and out of the affected area. Once the contaminated area has been established, the CCTC must determine whether and how to decontaminate this area. Close co-ordination with Host Nation authorities will be required.

- 16.13. Restoration. Hazard mitigation and elimination activities may impact on-going and future military operations, as temporary or permanent loss of access to equipment and facilities may occur. The lack of international standards for decontamination may complicate the restoration process.
- 16.14. Disengagement. As with restoration, disengagement may be complicated following a chemical event which may change the operational end-state. Close co-ordination between the strategic and operational levels will be required.
- 16.15. Strategic Communications. The potential public impact of a chemical event cannot be overstated. Therefore, an active Public Affairs posture is an absolute necessity, and must be an integral part of operational planning and execution. Public information, evacuation routes, and health education information must all form part of the strategic communications campaign, along with efforts to convince the adversary that chemical use is neither acceptable nor legitimate.

## 17. Biological Planning Considerations.

- 17.1. Detection. While there are a number of means to detect the use of biological agents or a naturally occurring outbreak, the CTF should consider planning options that maximize:
- 17.1.1. Medical surveillance. The ability to detect unusual symptoms and/or unusually high numbers of medical cases, unseasonal outbreaks of diseases, or outbreaks of diseases in unusual locations may all be indicative of BW attacks.
- 17.1.2. Biological collectors and sensors. Limited “detect to treat” technologies are available to warn CTF forces of a BW event. Optimal placement and use of these high demand/low density devices must be carefully planned to best mitigate BW risk to forces. Once detection is achieved and confirmed, this information should be used to cue detection elsewhere in the AO and to cause the CCTF to initiate protective actions beyond the area immediately affected.
- 17.1.3. Environmental surveillance. Routine testing of food, soil, water, consumable supplies, etc. can provide detection opportunities and may aid in the differentiation of naturally-occurring diseases and intentionally released BW agents. The sudden appearance of large numbers of sick or dead animals may also be indicative of biological pathogens.
- 17.2. Identification. The “presumptive data” obtained from BW sensors or medical/environmental surveillance will provide a commander with an initial indication of the agent or disease in question. With this information, the CCTF can initiate a limited set of responses, e.g., issuing prophylaxis, or increasing Force Protection levels prior to confirmation. Identification could occur during either the detection or confirmation processes.
- 17.3. Confirmation. Obtained via laboratory results, confirmation allows commanders to maintain, increase or decrease protective measures, quarantines, etc. In general, two different approved test methodologies are required for presumptive (theater) confirmation. Often, transborder shipment of samples is restricted, and movement of the laboratory facilities into theatre may be required. Close co-ordination with strategic commanders regarding the movement and sharing of samples amongst coalition partners is required.
- 17.4. Assessment. Once a biological event is detected, key questions to be addressed include defining the hazard, event, and damage in order to obtain the best estimate possible of the event impact.
- 17.4.1. HAZARD
- i. What is the presumptive/confirmed biological agent?
  - ii. What are the attributes of the agent(s)? For example, is it communicable? What is the lethality, morbidity/mortality rate, persistence, etc?
  - iii. What tests have been done to determine the agent/s, i.e., what confidence do we have that the event is not the result of more than one biological agent?
- 17.4.2. EVENT
- i. Is the event assessed to be a naturally occurring event or an intentional release of a BW agent?

ii. What areas are affected? Who was in the area when the attack or outbreak occurred, and who (CTF, local population, etc) has been exposed? What are the total numbers? Is there potential for spread of an infectious disease? Clearly state your assumptions.

iii. When did the event occur?

#### 17.4.3. DAMAGE

i. What is the incubation period?

#### 17.4.4. Estimate the IMPACT on the mission

i. What protective measures are effective against this biological agent(s)?

ii. What are the best treatments available for this agent? Should the affected population be evacuated, retrograded to receive medical treatment or should treatment be done in place?

iii. What are the estimates of physical and psychological effects? What are the collateral effects on the operational environment? What scale of response is required?

iv. What is the impact on the mission?

17.5. Attribution. Every effort should be made to capture the attacker, in order to increase the chance of achieving attribution. Slow detection of biological attack complicates this process but does not necessarily prevent it if procedures are in place to find and pursue the attacker; the latter effort will often require host nation assistance. Biological samples should be collected and maintained as criminal evidence. To contribute to the attribution and criminal investigation process, CCTF should anticipate providing multiple samples to coalition partners as well as independent third parties. As part of this process, a positive chain of custody to prevent tampering with samples must be established.

### 18. Radiological and Nuclear Planning Considerations.

18.1. Detection. Beyond the obvious (and easily detected) high energy blast, thermal, and x-ray effects of nuclear weapons, the spread of radioactive material via a radiological dispersion device or industrial accident may not be immediately obvious. Hence, additional methodologies for detection are also required for radiological and nuclear threats. In addition, nuclear or radiological devices may be detected prior to detonation due to the penetrating nature of the emissions of nuclear weapon materials.

18.1.1. Medical surveillance. Unusual symptoms and/or unusually high numbers of medical cases may be indicative of high dosage exposures from radiological or nuclear attacks or accidents. Personnel within relatively large ranges of a nuclear detonation may suffer skin or retinal burns from the thermal effects of even low yield nuclear weapons. Lower level radiological exposures may be difficult or impossible to detect during the mission time frame and will require attention based on the physical detection of effects of RN weapon material dispersion.

18.1.2. Radiological and Nuclear sensors. A wide variety of detection devices and methodologies are available with varying capabilities to measure the presence of different radioactive emissions and characterize their energy spectrum.

18.2. Identification. The data obtained from radiological sensors or medical surveillance will provide a commander with an initial indication of the presence of radiological material. With this information, the CCTF can initiate an appropriate set of responses, e.g., issuing prophylaxis, increasing the Force Protection Conditions levels, or evacuating the area.

18.3. Confirmation. Detection and confirmation are usually coincident for radioactive sources. Source identification, localization, and attribution will become a high priority.

18.4. Assessment. Key questions to be asked in the assessment phase include, but are not limited to:

#### 18.4.1. HAZARD

i. What is the nature of the event that occurred? Is it one for which prior planning has been done?

i-i. What is the source of radioactivity? Can it be neutralized or contained?

#### 18.4.2. EVENT

i. Is the event assessed to be natural, accidental or intentional?

ii. What detection devices provided initial indications?

iii. What protective measures are effective against this source(s)? How can time, distance and shielding be best employed to reduce hazards to persons?

iv. When did the event occur? What areas are affected? Who was in the area when the attack or accident occurred, and who (CTF, local population, etc) has been exposed? What are the total numbers? If a nuclear detonation, what was the yield, type of weapon, and location of the detonation? These factors can greatly affect the types of hazardous material produced and the resultant dispersion characteristics.

#### 18.4.3. DAMAGE

i. What are the estimates of physical and psychological effects? What are the collateral effects on the operational environment? What scale of response is required?

#### 18.4.4. Estimate IMPACT on the mission

i. Are subsequent events or releases likely, for example are other sources located in or close to the scene of an accident or was the detection indicative of the presence of an unexploded nuclear or radiological weapon? What was the genesis of the natural event or the delivery mechanism for an intended event?

18.5. Attribution. To contribute to the attribution and criminal investigation process, CCTF should anticipate providing multiple samples to coalition partners as well as independent third parties. As part of this process, a positive chain of custody to prevent tampering with samples must be established. Discovery of unexploded nuclear munitions or quantities of nuclear material will require immediate establishment of positive control of the nuclear material and possibly other munitions related material.

18.6. Prophylaxis. Medical actions to prevent the development of symptoms, consisting of two main types:

18.6.1. Pre-exposure. Potassium Iodide (KI) tablets comprise this category. KI is only effective to prevent the uptake of radioactive iodine commonly resulting from a nuclear reactor incident or nuclear detonation. Radioactive isotopes of iodine are not normally expected to be found as a result of a dirty bomb attack and KI would not normally be indicated in this situation. Adverse health effects can be associated with KI in some situations so KI should not be taken unless the presence of radioactive iodine is confirmed or imminent. Detection capabilities to determine the presence of radioactive iodine would be required to enable the utility of KI as a prophylaxis.

18.6.2. Post-exposure. No antidote is available per se, however immediate decontamination is important.

#### 18.7. Mitigation

18.7.1. Physical Protection. Required capabilities to survive and operate in a radiological or nuclear environment beyond those listed above

i. Individual protection. Radiological or nuclear materials are inhalation or ingestion hazards. Protective masks prevent inhalation of radioactive particles in the air. Mission-oriented protective posture (MOPP) suits prevent physical contact with radioactive particles. If a nuclear blast is considered imminent a variety of protective actions are available to minimize personnel exposure to blast and thermal effects and should be considered.

- ii. Collective protection. The number and types of collective protection shelters that are available for rapid deployment is extremely limited. The CCTF should avoid operating in contaminated areas to the greatest extent possible.

18.7.2. Active Defenses. It is normally expected that terrorists or Special Forces would deliver radiological weapons or seek to sabotage nuclear power plants. Nuclear weapons are relatively large and would need to be delivered by means similar to chemical weapons. Security forces with radiological detection devices would be key to intercepting radiological weapons or nuclear weapons delivered by land vehicles, while ballistic missile defenses and air defenses would be needed to deal with nuclear weapons delivered by air. Nuclear weapons delivered by land vehicle would require surveillance, detection, and access control commensurate to the assessed hazard and risk level for that threat. The CCTF should seek to maintain such defenses when the threat situation is uncertain or hostile.

## 18.8. Responses

18.8.1. Nuclear/radiological Weapon Elimination. Countries may not have detailed information about the nuclear weapons programs of their neighbors. Therefore, it may be difficult to locate and strike those programs. Storage, transport or delivery of nuclear weapons requires similar facilities and infrastructure to that for conventional weapons and may be known or detectable to CTF. Thus identification of the delivery mechanism used for a nuclear detonation could aid in elimination. In addition, radiological material can be found in a large number of places and diverted for terrorist use. Elimination is difficult against either of these threats.

18.8.2. Care and Management of Casualties. Planning must determine the capabilities and capacities of treatment facilities in the AO and where projected cases exceed in-theatre treatment capacity, CCTF must be prepared to develop a logistics support plan to include replacement of casualties.

- i. Decontamination. Evacuation of radiological or nuclear casualties can spread contamination to clean medical treatment facilities. Therefore, all casualties must be decontaminated as far forward as the situation permits.
- ii. CCTF should seek clear and effective policies from Strategic commanders outlining the obligation to provide medical support (to include a definition of acceptable standards of care) to civilians in the AO

18.8.3. Restriction of Movement (Cordon). CCTF must identify the contaminated area and take measures to prevent the spread of radiological contamination by restricting movement into the affected area. Forces exiting the contaminated areas must be decontaminated prior to rejoining unaffected units. Close co-ordination with Host Nation authorities will be required.

## 18.9. Recovery

18.9.1. Restoration. Hazard mitigation and elimination activities may impact on-going and future military operations, as temporary or permanent loss of access to equipment and facilities may occur. The lack of international standards for decontamination may complicate the restoration process. Timely removal of radioactive particles from contaminated surfaces is important. The greater the contact time of particles with surfaces, the more difficult the decontamination process will be.

18.9.2. Disengagement. As with restoration, disengagement may be complicated following a radiological event which may change the operational end-state. Close co-ordination between the strategic and operational levels will be required.

18.9.3. Strategic Communications. The potential public impact of a radiological event cannot be overstated. Therefore, an active Public Affairs posture is an absolute necessity, and must be an integral part of operational planning and execution. Public information, evacuation routes, and health education information must all form part of the strategic communications campaign, along with efforts to convince the adversary that nuclear or radiological weapon use is neither acceptable nor legitimate.

19. **References**

- 19.1. U.S. Joint Publication 3-07.2, Joint Tactics, Techniques, and Procedures for Antiterrorism, March 1998
- 19.2. U.S. Joint Publication 3-11, Operations in a Nuclear, Biological and Chemical (NBC) Environment, July 2000.
- 19.3. U.S. Joint Publication 3-50, Counterproliferation Operations, 2003
- 19.4. U.S. Joint Publication, Foreign Consequence Management Planning Guide, April 2001.
- 19.5. U.S. FM 3-11, MCWP 3-37.1, NWP 3-11, AFTTP 3-2.42, Multiservice Tactics, Techniques, and Procedures for Nuclear, Biological, and Chemical Defense Operations, March 2003.

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**Appendices:**

- Appendix 1: Chemical & TIM Threats.
- Appendix 2: Biological Threats.
- Appendix 3: Radiological and Nuclear Threats.
- Appendix 4: Glossary.

## Appendix 1

### CHEMICAL AND TIM THREATS

1. **Purpose.** To provide guidance to commanders and specify planning considerations for operations in a potential chemical environment, whether an accidental release of a TIM or a deliberate attack using chemical weapons or the intentional sabotage of an industrial facility. This appendix outlines procedures, and defensive conditions the CTF should consider when planning or conducting operations. Planners with chemical expertise serving joint staffs must maintain close working relationships with other staff planners with particular regard to operations, logistics, and medical planning efforts. Pre-incident planning is critical to successful chemical defensive operations.

#### 2. Scope

- 2.1. Chemical weapons are substances that are intended for use in military operations to kill, seriously injure, or incapacitate people through their physiological or psychological effects.
- 2.2. In addition to the military types of chemical weapons, the intentional or accidental release of toxic industrial materials (TIMs) from industrial storage areas, facilities, or transportation assets can pose a significant health hazard to the local population and/or forces operating in the area.

#### 3. Indications of a Chemical Attack

##### 3.1. Unusual dead or dying animals.

- 3.1.1. Numerous and various dead animals (domestic and wild; small and large).
- 3.1.2. Lack of insects, or dead insects on ground or near water surfaces.
- 3.1.3. If near water – dead fish and aquatic birds.

##### 3.2. Unexpected casualties

- 3.2.1. Multiple victims.
- 3.2.2. Miosis (pinpointed pupils), runny eyes and nose, nausea, disorientation, difficulty breathing, or convulsions.
- 3.2.3. Skin blisters or rashes.
- 3.2.4. Definite casualty patterns associated with agent dispersal (line source, single point, and wind direction).
- 3.2.5. Illnesses associated with enclosed areas and not open areas.

##### 3.3. Unusual liquid, spray or vapor

- 3.3.1. Droplets, oily film (with no recent rain).
- 3.3.2. Unexplained odor – newly mown grass, or bitter almond and peach seeds.
- 3.3.3. Low-lying clouds and fog unrelated to weather.

##### 3.4. Suspicious devices and packages

- 3.4.1. Unusual metal debris.
- 3.4.2. Abandoned spray devices.
- 3.4.3. Unexplained munitions.

3.5. Alarms or positive indications from chemical detection devices.

4. **Mitigation and Response.** The prioritization for CTF mitigation is personnel, equipment/facilities, and terrain.

4.1. Personnel: The initial need is to provide decontamination to the affected personnel. Physical removal of suspected agent must be performed as soon as possible to minimize adverse effects. Application of high volume, low water pressure, water using a fire truck and a fog nozzle is a practical method to perform field decontamination.

4.2. Equipment and facilities: Mitigation of equipment and facilities can be short term mitigation that requires protective clothing to operate the equipment and occupy the facilities. This entails the application of water/soap and water/bleach solutions to provide a quick decontamination of the equipment and facilities. The quick solution is not a completely safe solution and protective clothing will be required to operate the equipment and occupy the facilities.

4.2.1. In order to operate equipment safely without protective clothing, equipment replacement will be required.

4.3. Terrain: Natural weathering is the primary method to reduce terrain contamination. Spot applications of soap and water or bleach solutions may be used for spot applications. Long term terrain decontamination is a function of consequence management.

5. **Recovery.**

5.1. Use of hazardous materials response protective equipment, including self-contained breathing apparatus (SCBAs) may be indicated in some situations due to limitations of common military protective equipment. Protective clothing needs to be tailored to the mission and the properties of the chemical hazards.

5.2. Assume that all personnel and property have been potentially contaminated within the release area. Mark actual or suspected contaminated areas clearly.

5.3. Be alert for secondary devices that may be initiated after first responders have arrived on scene, either by booby traps or remotely triggered.

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## Tabs

Tab A: Chemical and TIM Technical Considerations

## TAB A

### CHEMICAL AND TIM TECHNICAL CONSIDERATIONS

#### 1. Types of Traditional Chemical Warfare Agents

##### 1.7. Nerve

- 1.7.1. Definition. Nerve agents affect the transmission of nerve impulses, causing continuous nerve activity or preventing nerve activity. The nerves or muscles may cease functioning because of over stimulation.
- 1.7.2. General Characteristics. Nerve agents are colorless to light brown liquids, and may be absorbed through the skin, respiratory tract, gastrointestinal tract, and the eyes. Significant absorption through the skin takes minutes, and prompt medical treatment and decontamination is imperative.
- 1.7.3. Agents. Tabun (GA), sarin (GB), soman (GD), and VX are nerve agents.
- 1.7.4. General Symptoms. Dimness of vision, constricted pupils, runny nose, localized sweating, difficulty breathing, nausea and vomiting, and involuntary twitching and jerking.

##### 1.8. Blister

- 1.8.1. Definition. Blister agents affect the body first as a cell irritant, and then as a cell poison. Agents initially cause irritation of the eyes and respiratory tract, reddening of the skin, then blistering or ulcerations, followed by systemic poisoning.
- 1.8.2. General Characteristics. Mustard agents are oily, colorless, or yellow-brownish liquids that smell of garlic or horseradish. Lewisite is an oily, colorless, or yellow-brownish liquid that smells of geraniums. Phosgene oxime (CX) is generally a colorless crystal or liquid with a disagreeable, penetrating odor.
- 1.8.3. Agents. Sulfur mustard (H), distilled mustard (HD), nitrogen mustard (HN), lewisite (L), and phosgene oxime (CX).
- 1.8.4. General Symptoms. Mustard symptoms are delayed eye inflammation and tearing, reddening of skin, blisters, and inflammation of nose and throat. Lewisite and phosgene oxime cause immediate pain with blisters, eye pain, and fluid in lungs.

##### 1.9. Choking

- 1.9.1. Definition. Choking agents irritate the alveoli in the lungs, causing them to constantly secrete fluid into the lungs. The lungs slowly fill with this fluid (a process known as pulmonary edema) and the victim can die of lack of oxygen (also known as dry land drowning).
- 1.9.2. General Characteristics. Choking agents are usually in colorless gaseous form, and may be absorbed through the respiratory tract.
- 1.9.3. Agents. Phosgene (CG) and chlorine (CL).
- 1.9.4. General Symptoms. Tearing of eyes, dry throat, feeling of suffocation, coughing, nausea, and vomiting. After 2 to 6 hours (when symptoms seem to reside), pulmonary edema sets in, marked by coughing, phlegm, and vomiting.

##### 1.10. Blood

- 1.10.1. Definition. Blood agents prevent cells from acquiring or using oxygen. Some cell types, particularly nerve and brain cells, rapidly die without oxygen.
- 1.10.2. General Characteristics. Blood agents are usually colorless gases of highly volatile liquids, and may be absorbed by the respiratory tract.

1.10.3. Agents. Hydrogen cyanide (AC), cyanogen chloride (CK), and arsine (SA).

1.10.4. General Symptoms. Headache, giddiness, tearing of eyes, gasping for air, vomiting, reddening of skin, and convulsions.

### 1.11. Vomiting

1.11.1. Definition. Vomiting agents produce a strong irritation in the upper respiratory tract.

1.11.2. General Characteristics. Odorless gas.

1.11.3. Agents. Adamsite (DM).

1.11.4. General Symptoms. Cold-like symptoms, violent sneezing, coughing, nausea, and vomiting.

## 2. Toxic Industrial Materials: There are at least three kinds of TIMs:

2.7. Toxic Industrial chemicals (TICs). TICs are the most common TIM threat of concern.

2.7.1. Definition. TICs are chemicals which can cause death, incapacitation, or permanent harm to humans (and also usually affect animals). There is a wide range of TICs that exist. They are used in standard chemical/industrial processes, and thus can be found in large quantities at production facilities, storage facilities, industrial plants using them as inputs, and on transportation vehicles designed to move them between these locations.

2.7.2. General Characteristics. TICs tend to be less lethal than standard nerve agents. A number of TICs are also classified as chemical warfare agents (e.g., chlorine and phosgene). The diversity of TICs leads to a great diversity in general characteristics. Nevertheless, many TICs are not detectable with standard military detection devices; specialized devices to detect TICs are needed. In addition, TICs fall into two important subcategories:

i. Chemicals against which the standard military IPE and CPS are effective. With these chemicals, the CTF CBRN Defense Officer mainly needs to note their location and notify forces operating in the vicinity of these locations in case they experience chemical effects.

ii. Chemicals against which the standard military IPE and CPS are less effective or not effective. These chemicals require HAZMAT or other protective gear. The CBRN Defense Officer needs to pay particular attention to the location of these TICs, clearly identifying these locations to the CCTF and commanders of subordinate units that will operate in their vicinity. When these TICs are present, the CBRN Defense Officer will normally need to have available a supply of HAZMAT or other protective clothing, and have personnel trained to operate in that clothing to address any spill or other hazard. The CCTF will also need to determine whether to augment security around the areas where these TICs are located.

2.7.3. Agents. Many chemicals, including: Ammonia, arsine, chlorine, hydrogen chloride, hydrogen cyanide, hydrogen sulfide, methyl isocyanate (as released at Bhopal), parathion, phosgene, sulfuric acid, and toluene diisocyanate.

2.7.4. General Symptoms. Depends upon the TIC, but several symptoms are common: Nausea, dizziness, headaches, coughing/choking, and throat irritation. Can affect the eyes, skin, respiratory tract, chest/heart, and the blood.

2.7.5. The Threat to Military Forces. TICs are found around the world, and often in industrial areas and ports (especially in the Middle East). An adversary may simply need to sabotage or explode normal storage or production facilities. Adversaries could also deliver TICs against a target from a tanker truck or rail car. With sabotage, the CTF may not be aware of the threat until its personnel are exposed and become symptomatic (unless TIC detectors are available).

2.7.6. Notes for the CBRN Defense Officer: TICs pose a threat to CTF personnel against which you will likely have little training or experience, and relative to which you will not find easy guidance. One of the best

references is: *NIOSH Pocket Guide to Chemical Hazards*, September 2005, found at: <http://www.cdc.gov/niosh/npg/>. Especially in regions with significant chemical industry activity, you will need to find individuals with a strong knowledge of TICs to help you identify the relative nature of the various threats and the steps that you need to take to deal with them.

- 2.8. Long-term health risks. These items include carcinogens, pollutants, and other materials that can cause long-term health hazards. Examples would include lead (as coming from old paint removed from walls) and asbestos. Because of the long-term character of these effects, these materials are unlikely to physically jeopardize the CTF mission, though they could play a role in psychological jeopardy.
- 2.9. Radiological materials. These are addressed in TAB C.
- 2.10. Some experts also identify flammable or explosive chemicals as TIMs, including chemicals like natural gas and propane. These agents can also cause asphyxiation; this Annex does not address the explosive character of these threats.

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## APPENDIX 2

### BIOLOGICAL THREATS

1. **Purpose.** To provide guidance to commanders for operations in a biological environment, whether a naturally occurring outbreak or a deliberate attack, and whether contagious or non-contagious diseases are present in the AO. This appendix outlines procedures and defensive conditions the CTF should consider when planning to conduct operations in a BW environment. Planners with biological expertise serving joint staffs must maintain close working relationships with other staff planners with particular regard to operations, logistics, and medical planning efforts. Additionally, close liaison with World and Host Nation Health Organizations is required throughout the conduct of operations. Pre-incident planning and planning considerations found in the Annex should be reviewed when considering force protection.
2. **Scope**
  - 2.1. Biological environment. The sum total of the combined challenges posed by diseases in dynamic natural environments and by man-made biological warfare (BW) agents. Existing and emerging naturally occurring diseases are a present and constant danger; surviving and operating through these conditions are first priority for the CCTF. BW attacks are normally less probable than naturally occurring diseases and thus surviving and operating through BW events are a secondary priority.
  - 2.2. Disease. Militaries have always operated in, and continue to operate in environments that pose health risks as a result of endemic disease, decreased hygiene, crowding, austere operating conditions, stress/fatigue, etc. Disease risks and their effects have accounted for up to 80% of all illnesses and injuries on the battlefield, and the military medical community has always taken these problems seriously. Nevertheless, disease risks remain a high concern and priority for the CCTF. This is due in part to an evolving problem set, i.e., globalization, population pressures, the appearance of novel diseases, the return of historic diseases with antibiotic resistance, etc., and in part because of the potential economic impacts.
3. **Indications of a Biological Attack.**
  - 3.1. Unusual dead or dying animals.
    - 3.1.1. Unusual number of sick or dead animals (can be present minutes, hours, days, or weeks after incident has occurred).
    - 3.1.2. Contact local area animal hospitals for additional casualties or similar symptoms.
  - 3.2. Unexpected casualties.
    - 3.2.1. Unusual illness for region and area (can be present minutes, hours, days, or weeks after incident has occurred).
    - 3.2.2. Definite pattern inconsistent with natural disease and/or associated with a specific dispersal method (e.g., food poisoning, wind direction).
    - 3.2.3. Contact local area hospitals for additional casualties or similar symptoms.
  - 3.3. Unusual liquid, spray, or vapor. This may or may not present with an identifiable odor.
  - 3.4. Unusual swarms of insects. Insect swarms may be indicative of a biological agent attack with the insects serving as the delivery vector.
  - 3.5. Suspicious devices and packages. Spraying devices or suspicious packages may indicate that an attack has occurred or is underway.
  - 3.6. Unusual dead or dying plants (for plant diseases).

## 4. Mitigation

- 4.1. Prophylaxis. Medical actions to prevent the development of symptoms, consisting of two main types:
  - 4.1.1. Chemical. Antibiotics, antivirals and antitoxins comprise this category; and
  - 4.1.2. Vaccines. Generally, vaccines are administered prior to exposure. Relatively few vaccines exist against BW agents.
- 4.2. Physical Protection. Required capabilities to survive and operate in a biologically contaminated environment beyond those listed above. The CCTF should avoid operating in contaminated areas to the greatest extent possible.
  - 4.2.1. Individual protection. Most biological agents are inhalation hazards; some are contact hazards and others are food/water-borne agents. Protective masks protect against most aerosolized agents. Mission-oriented protective posture (MOPP) suits are effective against most contact hazards. Self-contained protective equipment, e.g., suits with battery-powered positive pressure purified air, will severely limit military operations, and are relatively scarce. Respirators and even surgical masks give some protection against biological agents, and have the advantage of minimal operational degradation, especially when worn for 12 duty hour shifts or longer.
  - 4.2.2. Collective protection. The number and types of collective protection shelters that are available for rapid deployment is extremely limited.
  - 4.2.3. Other Protective Measures. Additional protective measures include hand-washing, good field sanitation, prepackaged food and bottled water.
- 4.3. Active Defenses. It is normally expected that adversary Special Forces and/or agents will be used to deliver biological weapons due to the small quantities required to have operational impacts. Moreover, biological weapons can be released some distance from a target if the wind direction and related conditions can be accurately predicted. It is therefore more difficult to organize active defenses against biological weapon release. The principal effort involves security forces deployed around likely targets, with these forces intercepting anyone without a good reason/permission for being in the area. The CCTF should seek to maintain such defenses when the threat situation is uncertain or hostile.
- 4.4. Biological Weapon Elimination. Normally, countries do not know much about the biological weapons programs of their neighbors. It is therefore difficult to locate and strike those programs. Ground forces may be able to capture the area where biological weapons are stored, but even then it may be difficult to locate and eliminate those weapons. Nevertheless, the CCTF should examine potential biological weapon elimination options.

## 5. Response

- 5.1. Strategic Communications. The potential public impact of a biological event cannot be overstated. Therefore, an active Public Affairs posture is an absolute necessity, and must be an integral part of operational planning and execution. Public information, evacuation routes, and health education information must all form part of the strategic communications campaign, along with efforts to convince the adversary that biological weapon use is neither acceptable nor legitimate.
- 5.2. Care and Management of Casualties. Planning must determine the capabilities and capacities of treatment facilities in the AO and where projected cases exceed in-theatre treatment capacity, CCTF must be prepared to develop a logistics support plan to include replacement of casualties.
  - 5.2.1. Treat in place. Medical planners must plan for long-term care and symptom-based intensive care treatment rather than surgery, which is the basis for most deployable military medical units. There is an on going debate about the ability of coalition forces to “evacuate and treat” its own disease casualties, and to assist in the movement of other disease casualties. The basis for this debate is the lack of clear and effective national or multinational policies to guide the movement of infected/infectious patients using military and civilian aircraft, and the movement of these patients across international borders.

Currently, “treat in place” may be the commander’s only viable option. This is a major driver for medical planning in a biological event scenario.

5.2.2. CCTF should seek clear and effective policies from Strategic commanders outlining the obligation to provide medical support (to include a definition of acceptable standards of care) to civilians in the AO.

5.2. Quarantine and Restriction of Movement. CCTF must identify the contaminated area and take measures to prevent the spread of disease by restricting movement into and out of the affected area. These actions address diseases like anthrax which is not contagious but the spores persist once spread. Alternatively, for contagious diseases, the focus must be on the people exposed rather than the area. People exposed to a contagious or readily communicable disease should be quarantined, while people exposed to other diseases may still need to be quarantined because of potential psychological reactions. Because it is normally impossible to determine who has been exposed before they exhibit symptoms, a large number of people may need to be quarantined. Once established, quarantine areas or quarantined populations must be logistically supported, which will require large numbers of people and may require a decontamination process. Moreover, the CCTF may be called upon to enforce the quarantine or assist in enforcing it. Close co-ordination with Host Nation authorities will be required. This is particularly important in a contagious disease scenario. Quarantine of animals may be required with the spread of agricultural diseases, with the CCTF potentially also involved in such quarantine.

5.3. Biological/Toxin sampling.

5.6.1. To ensure the integrity of physiological samples, adherence to correct collection, handling and transporting procedures is essential. The quality of any analytical evaluation is directly related to the quality of the specimen and degree of post-collection degradation that occurs prior to testing. For attribution and sample integrity purposes, ensure a positive chain of custody is defined, established, and in place.

5.6.1. Requests for biological sampling will be directed by the CTF C3 in coordination with the CTF Surgeon. Requests will be coordinated with the medical community and CBRN detection assets.

5.6.1. Different agencies will perform the collection of samples depending upon the type of sample to be collected and the assets available to the CCTF.

5.6.1. Medical or Health Service Support (HSS) personnel, supported by CBRN detection personnel, will perform the collection of biomedical samples.

5.6.1. Environmental sampling not involving humans or animals will be conducted by CBRN detection personnel in accordance with service doctrine and unit standard operating procedures under the direction of the CCTF.

5.6.1. Sampling units will transfer samples to the CTF-designated CB transfer point for analysis or further retrograde to designated test and analysis sites for the MNF effort.

## 6. **Recovery.**

6.1. Restoration. Hazard mitigation and elimination activities may impact on-going and future military operations, as temporary or permanent loss of access to equipment and facilities may occur. The lack of international standards for decontamination may complicate the restoration process. If a contagious agricultural disease is spread, animals vulnerable to that disease may need to be destroyed and properly disposed of in large numbers, and the CCTF may be asked to assist in that process.

1.1. Disengagement. As with restoration, disengagement may be complicated following a biological event which may change the operational end-state. Close co-ordination between the strategic and operational levels will be required.

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## **Tabs**

Tab A: Biological Technical Considerations

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## TAB A

### BIOLOGICAL TECHNICAL CONSIDERATIONS

1. **Potential Biological Agents.** Biological warfare is the intentional use of organisms or chemicals of biological origin to cause death and disease among personnel, animals, and plants. Biological agents can enter the body through the respiratory tract, ingestion, or direct contact with skin or membranes. Unlike chemical agents, exposure to biological agents may not be immediately apparent, with casualties occurring hours, days, or weeks after exposure. People exposed to biological pathogens like anthrax or smallpox may not feel sick for some time. This delay between exposure and onset of illness, the incubation period, is characteristic of infectious diseases. In many cases, the first indication of a biological agent attack may occur after a number of unusual illnesses begin to appear in local hospital emergency rooms. Some biological diseases affect both people and animals, while some affect only animals, and some affect only plants. The CCTF may need to address all of these different types.

1.1. **Dispersal.** Biological agents are primarily deployed through aerosol spray. They can also be dispersed through vectors, or in food or water. Anthrax and ricin have been dispersed through the mail in some instances.

#### 2. Types of Biological Agents

##### 2.1. Bacteria.

2.1.1. Definition. Bacteria are single-cell organisms that reproduce by cell division. Under ideal conditions, some bacteria can reproduce as quickly as 20 minutes.

2.1.2. Agents. Anthrax, plague, brucellosis, and tularemia (rabbit fever).

##### 2.2. Viruses

2.2.1. Definition. Viruses are organisms that require living cells in which to replicate, and are unable to reproduce outside the tissue of the host.

2.2.2. Agents. Smallpox, Venezuelan equine encephalitis (VEE), and yellow fever.

##### 2.3. Toxins

2.3.1. Definition. Toxins are nonliving poisons derived from living organisms.

1.7. Agents. Botulinum toxin, ricin, staphylococcal enterotoxin B, and saxitoxin.

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## APPENDIX 3

### RADIOLOGICAL AND NUCLEAR THREATS

1. **Purpose.** To provide guidance to commanders and specify planning considerations for operations in a potential radiological or nuclear environment. This appendix outlines procedures and defensive conditions the CTF should consider when planning or conducting operations. Planners with radiological and/or nuclear expertise serving joint staffs must maintain close working relationships with other staff planners with particular regard to operations, logistics, and medical planning efforts. Pre-incident planning is critical to successful radiological or nuclear defensive operations.
2. **Scope.** Radioactivity is the spontaneous emission of photons or particles directly from the nuclei of unstable atoms or as a consequence of a nuclear reaction. Nuclear radiation refers to the particles or photons in the form of alpha particles, beta particles, neutrons, or gamma rays that are emitted by unstable nuclei. Radiation also refers to x-rays that are high energy photons emitted by an atom. They can be released as the result of a radiological dispersal device (a so-called “dirty” bomb), nuclear-industrial accidents, or military nuclear weapons.
3. **Indications of a Radiological Attack**
  - 3.1. A stated threat to deploy a nuclear or radiological device.
  - 3.2. The presence of nuclear or radiological equipment (e.g., spent fuel canisters or nuclear transport vehicles).
  - 3.3. Radiation is an invisible hazard. There are no initial characteristics or properties of radiation itself that are noticeable, and while there are numerous detection devices, no single apparatus detects all forms of radiation.
4. **Scenarios constituting an intentional radiological emergency include:**
  - 4.1. Use of a Radiological Dispersal Device (RDD). An RDD includes any explosive device utilized to spread radioactive material upon exploded detonation. Any improvised explosive device can be used by surrounding it with radioactive material.
  - 4.2. Use of a simple RDD, where radiological material is spread without the use of an explosive. Any nuclear material (including medical isotopes or waste) can be used in this manner.
5. **Recovery.**
  - 5.1. Treat all nuclear or radiological incidents as HAZMAT situations.
  - 5.2. Assume all personnel and property may have been contaminated within the release area.
  - 5.3. Reduce the amount of time exposed.
  - 5.4. Increase distance from the radioactive source.
    - 1.1. Use shielding between personnel and the source of radiation.

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Tab A: Radiological and Nuclear Technical Considerations

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## TAB A

### RADIOLOGICAL AND NUCLEAR TECHNICAL CONSIDERATIONS

1. **Potential Nuclear and Radiological Agents.** Most people, when thinking about nuclear weapons, immediately imagine rocket-type missiles racing through the air. However, there are actually a variety of nuclear weapons. Nuclear weapons are far more powerful than conventional weapons – a small nuclear bomb contains the same power and energy as around 40,000 conventional bombs.
  - 1.1. Fission Weapons
    - 1.1.1. These are probably the most simplistic nuclear weapons in terms of design and build. Pure fission weapons are ones that use just a fission reaction rather than a combination reaction of fission and fusion. A fission reaction is the splitting of an atomic nucleus, which then results in massive energy release. Fission weapons also provide the fundamental design for more advanced weapons. These fission weapons can be both tactical and strategic.
  - 1.2. Boosted Fission Weapons
    - 1.2.1. This type of nuclear weapon uses a combination of fission and fusion, thus increasing the energy and power of the weapon. The fusion reaction increases the speed at which fission takes place, and increases the effectiveness of the weapon. The increase in energy and efficiency means that these weapons are also lighter as well as more powerful than pure fission weapons.
  - 1.3. Thermonuclear Weapons
    - 1.3.1. Also known as a hydrogen bomb, this type of weapon also deploys a combination of fission and fusion. A fission reaction is used to trigger the fusion reaction, which provides the majority of the power and energy of this weapon. Thermonuclear weapons are the most powerful nuclear weapons.
  - 1.4. Enhanced Radiation Weapons
    - 1.7. This type of weapon is also known as a neutron bomb, and is smaller type of thermonuclear weapon which produces high levels of nuclear radiation.

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## APPENDIX 4

### GLOSSARY

**Acute Exposure.** A single exposure to a substance or multiple exposures occurring within a short time, usually 24 Hours or less.

**Aerosol.** Fine liquid or solid particles suspended in a gas; for example, fog or smoke.

**Anthrax.** An infectious, usually fatal disease of warm blooded animals, especially of cattle and sheep. The disease can be transmitted to humans through contact with contaminated animal substances, such as hair, feces, or hides, and is characterized by ulcerative skin lesions. Depending on transmission, a contact infection, alimentary (intestinal) infection, or an airborne infection may develop. The respiratory form is most severe, and unless treated early with antibiotics, death ensues within a week.

**Antitoxin.** An antibody formed in response to and capable of neutralizing, a biological poison.

**Asphyxiants.** Substances that replace oxygen, eventually making breathing impossible.

**Bacteria.** Single-celled organisms that multiply by cell division and can cause disease in humans, plants, or animals.

**Biological Warfare.** The intentional use of biological agents as weapons to kill or injure humans, animals, plants, or to damage equipment.

**Biological Warfare Agents.** Living organisms or the materials derived from them that cause disease in or harm to humans, animals or plants, or cause deterioration of material. Biological agents may be used as liquid droplets, aerosols, or dry powders.

**Blister Agents.** Category of chemical warfare agents that damage any tissue they contact. They may produce lethalties, but skin damage is their main casualty causing effect. All these agents are persistent and can poison food and water, make other supplies and installations dangerous, and restrict the use of contaminated terrain.

**Blood Agents.** Compounds containing cyanide that are absorbed into the body primarily by breathing. They prevent cell respiration and the normal transfer of oxygen from the blood to body tissues. Rapid acting, they can cause effects within seconds, and death within minutes.

**Botulinum Toxin.** One of the most poisonous bacterial substances known. The bacteria grows on poorly preserved food and causes a severe form of food poisoning (botulism). The victim becomes ill with severe stomach pains within a day. The whole body, including the muscles used in respiration, becomes paralyzed, which leads to death by suffocation within a few days.

**Brucellosis.** A bacterial infection that can cause abortion in animals and remittent fever in humans.

**Bubonic Plague.** An acute infectious disease caused by bacteria transmitted to humans by fleas from infected rats. Invasion of the lungs by the bacteria causes a rapidly fatal form of the disease that can be transmitted between persons via droplets. Also known as plague.

**Causative Agent.** The organism or toxin that is responsible for causing a specific disease or harmful effect.

**Chemical Warfare Agents.** A chemical substance that is intended for use in military operations to kill, seriously injure, or incapacitate people through its physiological effects.

**Choking Agents.** Compounds that injure the respiratory tract. In extreme cases, membranes swell, lungs become filled with liquid, and death can result from lack of oxygen.

**Chronic Exposure.** Repeated exposure to a substance over a relatively long period of time.

**Contagious.** Capable of being transmitted from one person to another.

**Collective Protection.** This is the protection provided to a group of individuals in a CBRN-TIM environment, which permits relaxation of individuals in a CBRN-TIM environment.

**Damage.** Damage is the reduction in the overall potential operations capability resulting from a CBRN-TIM accident or attack. This would include injury to CTF personnel and the general population, and destruction or degradation of operability of equipment and command infrastructure within the CTF's Area of Operations.

**Decontamination.** The process of making people, objects, or areas safe by absorbing, destroying, neutralizing, making harmless, or removing the hazardous material.

**Detection.** The discovery of a CBRN-TIM by any means at the broad level e.g. chemical, biological, radiological contamination. These means would include electronic detector, reaction kits and visual of the condition of the terrain and its ecology.

**Event.** An event is the realization or delivery of a hazard (CBRN-TIM) into the CTF's Area of Operations that would result in damage. Multiple events occur when a hazard is delivered in multiple ways or at multiple locations more or less simultaneously.

**Fissile Material.** An isotope that readily fissions after absorbing a neutron of any energy, either fast or slow. Fissile materials are uranium-235, uranium-233, plutonium-239, and plutonium-241. Uranium-235 is the only naturally occurring fissile isotope.

**Fission.** The splitting of the nucleus of a heavy atom into two lighter nuclei. It is accompanied by the release of neutrons, x-rays, gamma rays, and kinetic energy of the fission products.

**Fusion.** The opposite of fission, in which two light nuclei atoms combine to form a heavier nucleus with the release of a substantial amount of energy. Extremely high temperatures are required to initiate fusion reactions.

**Gamma Ray Radiation.** High-energy electromagnetic radiation emitted by nuclei during nuclear reactions or radioactive decay. These rays have high energy and short wave length, and are potentially lethal to humans.

**Half Life.** The period of time for a chemical or radioactive substance to lose half its concentration or activity due to metabolic uptake, decay, or other chemical change.

**Hazard.** It is a natural or manmade phenomenon that has the potential to adversely affect CTF's operations, general population and terrain in the CTF's Area of Operations.

**Hemorrhagic Fever.** Any of a diverse group of diseases characterized by a sudden onset of symptoms, including fever, aching, internal bleeding, and shock. Includes Ebola, Lassa, and Marburg.

**Host.** An animal or plant that harbors or nourishes another organism.

**Identification.** This would be the determination of the specific identity of an agent or material involved in a CBRN-TIM accident or attack e.g. tabun, sarin, *Bacillus anthracis*, Cesium-137 and not the broader category they belong to.

**Immediately Dangerous to Life and Health (IDLH).** An atmosphere where the concentration of oxygen or flammable or toxic air contaminants would cause a person without respiratory protection to be fatally injured or would cause irreversible and incapacitating effects on that person's health.

**Immunization.** The act of artificially stimulating the body to develop antibodies against infectious disease by the administration of vaccines or toxoids.

**Infectious Agents.** Biological agents capable of reproducing in an infected host.

**Infectivity.** (1) The ability of an organism to spread. (2) The number of organisms required to cause an infection to secondary hosts. (3) The capability of an organism to spread out from the site of infection and cause disease in the host organism.

**Irritants.** Substances that cause reddening, itching, or pain to exposed bodily parts.

**LCt50.** Median lethal dosage of a chemical agent vapor or aerosol. Represents the concentration that was fatal to 50 percent of a test population.

**LD50.** Median lethal dosage of a liquid chemical agent. Represents the concentration that was fatal to 50 percent of a test population.

**Line-Source Delivery System.** A delivery system in which the biological agent is dispersed from a moving ground or air vehicle in a line perpendicular to the direction of the prevailing wind.

**Liquid Agent.** A chemical agent that appears to be an oily film or droplets. The color ranges from clear to brownish amber.

**Microorganism.** Any organism, such as bacteria and viruses, which can be seen only with a microscope.

**Mitigation.** Mitigation is a set of activities/procedures that could be undertaken before, during and/or after the event occurs to reduce, eliminate or prevent the potential damage that could result from a CBRN-TIM accident or attack.

**Monitoring/Surveillance.** Systematic observation using detectors to observe the CTF's Area of Operations for CBRN-TIMs accident and/or attacks. This would include aerospace, surface areas, places, persons or things by visual, electronic, mechanical, or other means for determining the presence or absence of CBRN-TIM hazards. This could be conducted pre-event, post-event or during the event.

**Nebulizer.** A device for producing a fine spray or aerosol.

**Nerve Agents.** Compounds that cause a disruption in normal neurologic function. Symptoms appear rapidly with death occurring as rapidly as several minutes.

**Nonpersistent Agent.** An agent that, upon release, loses its ability to cause casualties after 10 to 15 minutes. It has a high evaporation rate, is lighter than air, and will disperse rapidly. It is considered to be a short-term hazard. In unventilated areas, the agent will be more persistent.

**Organism.** Any individual living thing, whether animal or plant.

**Pandemic.** Denoting a disease affecting or attacking the population of an extensive region, country, or continent.

**Parasite.** Any organism that lives in or on another organism without providing benefit in return.

**Pathogen.** Any organism (usually living) capable of producing serious disease or death.

**Persistent Agent.** An agent that, upon release, retains its ability to cause casualties for an extended period of time, usually anywhere from 30 minutes to several days. It usually has a low evaporation rate and its vapor is heavier than air. It is considered to be a long-term hazard.

**Physical Protection.** This is the individual protective equipment such as clothing and equipment required to protect an individual from CBRN-TIM agents.

**Plague.** An acute infectious disease caused by bacteria transmitted to humans by fleas from infected rats. Invasion of the lungs by the bacteria causes a rapidly fatal form of the disease that can be transmitted between persons via droplets. Also known as bubonic plague.

**Plume.** Airborne material spreading from a particular source; the dispersal of particles, gases, vapors, and aerosols into the atmosphere.

**Point-Source Delivery System.** A delivery system in which the biological agent is dispersed from a stationary position. This delivery method results in coverage over a smaller area than with the line-source system.

**Prevention.** Prevention is a set of activities/procedures conducted to reduce or avoid the probability of a CBRN-TIM incident occurring.

**Prophylaxis.** The medical measure taken to prevent the occurrence of disease or damage to the CTF. These measures can be taken prior to or after a CBRN-TIM event.

**Protection.** Protection is system of actions conducted before, during and after a CBRN-TIM event that would allow the CTF to operate after a CBRN-TIM accident or attack. Protection would include physical and medical measures. See “Physical Protection” and “Collective Protection” of this glossary for further definition.

**Q Fever.** An infectious disease that is highly infectious, but rarely kills. It is rarely transmitted from one person to another.

**Rabbit Fever.** An infectious disease that chiefly affects rodents, but can also be transmitted to humans through insect bites or contact with infected animals. Certain strains can be deadly. Also called tularemia.

**Response.** Actions undertaken after an occurrence of a CBRN-TIM accident or attack.

**Ricin.** A poisonous protein extracted from the castor bean and used as a biochemical agent. Ricin poisoning occurs through blockages of the body’s synthesis of proteins. The development is slow and includes decreased blood pressure. Death frequently occurs through heart failure.

**Risk Assessment.** Risk assessment is set of activities/procedures that would allow the risk analysis of potential CBRN-TIM. This would identification of hazards n the Area of Operations and CTF force’s CBRN-TIM defense capabilities.

**Sampling.** This is the physical retrieval for analysis of material known or suspected to have been involved in a CBRN-TIM accident or attack. Samples could be acquired from personnel, animals or the environment suspected or known to be exposed to the CBRN-TIM agents.

**Saxitoxin.** A potent neurotoxin produced by certain microscopic organisms that accumulate in shellfish feeding on these organisms, and consequently causes food poisoning in humans who eat the shellfish. Illness develops extremely rapidly and death may occur within less than 15 minutes.

**Situation.** Situation is a state that is characterized by the CTF forces CBRN-TIM defense capabilities, the physical environment and the general civilian population in the Area of Operations.

**Smallpox.** An acute, highly contagious, sometimes fatal disease causing a high fever and widespread skin eruptions. Caused by a virus that may be airborne or spread by direct contact.

**Spore.** A reproductive form some microorganisms can take to become resistant to environmental conditions, such as extreme heat or cold, while in a “resting stage.”

**Surveillance.** See “Monitoring” of this glossary.

**Target Unit.** An entity that is affected by the event and defined in terms of population, infrastructure and forces in the Area of Operations.

**Toxicity.** A measure of the harmful effects produced by a given amount of a toxin on a living organism. The relative toxicity of an agent can be expressed in milligrams of toxin needed per kilogram of body weight to kill experimental animals.

**Toxin.** A substance, produced in some cases by disease causing microorganisms, which is toxic to other living organisms. Toxins have a low volatility and are generally dispersed as aerosols. Primary hazard is inhalation.

**Toxoid.** A modified bacterial toxin that has been rendered nontoxic, but retains the ability to stimulate the formation of antitoxins, and thus producing an active immunity.

**Tularemia.** An infectious disease that chiefly affects rodents, but can also be transmitted to humans through insect bites or contact with infected animals. Certain strains can be deadly. Also called rabbit fever.

**Vaccine.** A preparation of killed or weakened microorganism products used to artificially induce immunity against a disease.

**Vapor Agent.** A gaseous form of a chemical agent. If heavier than air, the cloud will be close to the ground. If lighter than air, the cloud will rise and disperse more quickly.

**Vector.** An agent, such as an insect or rat, capable of transferring a pathogen from one organism to another.

**Venezuelan Equine Encephalitis (VEE).** An airborne virus that is transmitted from animals to humans through mosquitoes that have fed on infected animals.

**Virus.** An infectious microorganism that exists as a particle rather than as a complete cell. Viruses are not capable of reproducing outside of a host cell.

**Volatility.** A measure of how readily a substance will vaporize.

**Vomiting Agents.** Produce nausea and vomiting effects; can also cause coughing, sneezing, pain in the nose and throat, nasal discharge, and tears.

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