

**AJP-3.8**

**ALLIED JOINT DOCTRINE  
FOR NBC**

**JULY 2003**

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**NORTH ATLANTIC TREATY ORGANIZATION**  
**NATO STANDARDIZATION AGENCY**  
**NATO LETTER OF PROMULGATION**

July 2003

1. AJP-3.8 - DOCTRINE FOR THE NBC DEFENCE OF NATO FORCES is a NATO/PfP UNCLASSIFIED publication. The agreement of nations to use this publication is recorded in STANAG 2451.
2. AJP-3.8 is effective on receipt and supersedes ATP-59(A) which should be destroyed in accordance with the local procedure for destruction of documents.



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Rear Admiral, NONA  
Director, NSA

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## **RECORD OF RESERVATION BY NATIONS**

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## PREFACE

*“The Alliance is to deter and defend against the use of NBC weapons. The aim in doing so is to further reduce operational vulnerabilities of NATO military forces while maintaining their flexibility and effectiveness despite the presence, threat or use of NBC weapons”. (Alliance Strategic Concept, 29 April 99 C/M(99)21).*

### Introduction

- 001. The successful planning, execution and support of NBC defence within military operations requires a clearly expressed and widely available Nuclear, Biological and Chemical (NBC) Defence Doctrine. This is especially important when operations are to be conducted by Alliance or coalition forces.
- 002. AJP-3.8<sup>1</sup> describes the functional area of NBC defence. It is a level 2 ‘Supporting Joint Doctrine’ publication and it is subordinate to the Keystone AJP-3 (Allied Joint Operations) which in turn is subordinate to the Capstone AJP-01 (Allied Joint Doctrine). All other NATO documents with an NBC content will need to reflect the specialist guidance provided by AJP-3.8.
- 003. Although AJP-3.8 is intended for use by NATO forces, the doctrine is equally applicable to operations conducted by a coalition of NATO and non-NATO nations within the framework of a NATO-led Combined Joint Task Force (CJTF) or for European Union (EU) led operations using NATO assets and capabilities.
- 004. It is not intended that AJP-3.8 shall restrict the authority of a Joint Force Commander (JFC). The JFC will, subject to the constraints imposed by the directives issued by higher authority, be expected to organise the assigned forces and to plan and execute operations in a manner intended to ensure unity of effort in accomplishing the mission. The publication is intended for use primarily by commanders and staffs at the operational level but could be used at any level as a reference.

### Objectives

- 005. **AJP-3.8.** The objective of AJP-3.8 is to provide NATO NBC Defence Doctrine for the planning, execution and support of joint operations by establishing fundamental principles for the guidance of operational level commanders and their staffs in an NBC environment.
- 006. **NBC Defence.** The objective of NBC defence is to help to deter the use of NBC weapons and to protect forces from NBC events so that they are able to accomplish the mission and

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<sup>1</sup> STANAG 2451 provides the cover for AJP-3.8.

maintain freedom of action. An NBC event includes the release of hazards from use of NBC weapons and Release Other Than Attack (ROTA).

### **Force Protection**

007. In accordance with AJP-3, Force Protection aims to conserve the fighting potential of the deployed force by countering the wider threat to its elements from adversaries, natural and human hazards, and fratricide. Force Protection principles provide a guide for NBC defence.

### **NBC Defence**

008. **Definition.** NBC defence is defined as all measures designed to defend against attacks with nuclear, biological, chemical and radiological weapons or the hazards arising from Release Other Than Attack.<sup>2</sup>

### **Scope**

009. AJP-3.8 provides NATO forces with the NBC Defence Doctrine for the planning, execution and support of NATO operations where there is a risk of NBC and TIM hazards. NBC Defence Principles are established for the guidance of strategic and operational level commanders and their staffs. These principles provide a foundation for the preparation of a Joint Force for NBC defence and the conduct of NBC defence on operations before, during and after an NBC event.
010. **Limitations.** AJP-3.8 does not cover actions to nullify or reduce the effectiveness of possible offensive use of NBC weapons by an adversary (active defence and/or counter-force operations).

### **Amendment**

011. If it is to be useful, AJP-3.8 has to be a living document and be amended regularly. The NBC Defence Operations Inter-Service Working Group will review, and amend as required, the contents periodically.

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<sup>2</sup> AAP-21.

# ALLIED JOINT DOCTRINE FOR NBC AJP-3.8

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# CHAPTER 1 – NUCLEAR, BIOLOGICAL AND CHEMICAL RISKS AND HAZARDS

## Section I - Introduction

0101. This Chapter provides a broad description of the Nuclear Biological and Chemical (NBC)<sup>1</sup> risks within the global security environment and the relationship between Force Protection principles and NBC Defence. The characteristics and effects of NBC weapons and Release Other Than Attack (ROTA) events are described. Deductions are then made about the resulting NBC hazards and their impact on the operational capability of a deployed Joint Force.

## Section II - The Strategic Context

0102. Whilst the Cold War has ended and the threat of Global nuclear war has receded, the World remains unstable. There are a growing number of regional conflicts and the employment of asymmetric means by non-state forces, terrorists and extremist groups. Despite sustained efforts in the field of arms control, there is firm evidence of a continuing worldwide proliferation and development of NBC weapons and their delivery systems. At the same time, expanding urbanisation and the global distribution of nuclear, biological and chemical industries and materials increases the possibilities of the release of Toxic Industrial Materials (TIM) into the environment as a result of neglect, natural disaster, deliberate action or collateral damage in the course of military operations.
0103. NATO undertakes political and diplomatic activities to eliminate the proliferation of NBC weapons, promote their destruction and deter their use. Diplomatic and political pressure is required to deter the development of NBC offensive programmes through treaty<sup>2</sup> compliance. Treaty compliance is confirmed by arms control verification, and may involve inspections and/or embargoes.
0104. NATO operations need to be planned and conducted against a background of the risk of employment of NBC weapons<sup>3</sup> and agents against its forces. Additionally, across the whole spectrum of conflict, including Non-Article 5 Crisis Response Operations (CRO),<sup>4</sup> there may be a risk of release of harmful substances from damaged industrial facilities or nuclear installations. Therefore, NATO forces need not only to be capable of defence against conventional attacks but also to be proficient in conducting operations over protracted

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<sup>1</sup> The term CBRN (Chemical, Biological, Radiological and Nuclear) is sometimes used instead of NBC to separate nuclear and radiological weapons.

<sup>2</sup> Geneva Convention 1925; Nuclear Non-Proliferation Treaty 1970; Biological Weapons (BW) Convention 1972; Chemical Weapons (CW) Convention 1993.

<sup>3</sup> NBC weapons are sometimes grouped together under the heading of Weapons of Mass Destruction (WMD).

<sup>4</sup> The term 'CRO' rather than 'Military Operations Other Than War' (MOOTW) is used throughout AJP-3.8, in accordance with MC 327/2 Non-Article 5 Crisis Response Operations (NA5CRO).

periods in an NBC environment. These latter conditions can result both from the use of NBC warfare agents and from ROTA.

0105. **Asymmetric Means.** In the face of continuing NATO superiority in conventional military capabilities, adversaries may seek unconventional strategies and tactics, including the use of NBC agents and TIM, to reduce this advantage. Adversaries are likely to focus on perceived NATO weaknesses and vulnerabilities such as the sensitivity of public opinion to casualties and other such cultural, legal and ethical constraints. Attempts may be made to employ the threat of NBC use within propaganda to constrain Alliance or Coalition Rules of Engagement (ROE) and to detach wavering Alliance/Coalition members. Adversaries may have scant regard for international law and ethical standards, allowing them to engage in the deliberate targeting of civilian populations, including expatriates, or the deliberate siting of military assets amongst civilian infrastructure or cultural sites.
0106. **The NATO NBC Defence Requirement.** NBC defence should not be an end in itself but should permit operations to continue with the minimum of degradation and loss of tempo. NATO needs to make a realistic and continual assessment of NBC threats and risks. NATO forces need the appropriate policy, doctrine, organisation, equipment and training for effective NBC Defence. The resulting joint NATO NBC Defence capability needs to reflect the potential risks and the consequent need to be able to survive and operate in such NBC conditions. This document sets out or makes reference to NATO NBC Defence policy, doctrine, standardisation agreements (STANAGS) and equipment requirements.

### **Section III - NBC Defence and Force Protection**

0107. The following Force Protection principles are used as a guide for NBC defence operations:
- a. **Assessment of the Threat.** Threat assessments, based on accurate and timely all-source intelligence, need to be continuously conducted so that the appropriate NBC Defence capabilities and measures can be selected.
  - b. **Risk Management.** The principle is Risk Management, not risk elimination. Casualties and materiel degradation are inevitable in any military operation even without conflict and a desire to avoid them totally is likely to impact adversely on the achievement of the mission. There will thus be a need for commanders to actively define and manage the balance of human costs against operational imperatives. The Force Protection philosophies used by the different nations in a coalition may however need to be co-ordinated.
  - c. **Joint and Multinational Operations.** NBC defence needs to embrace all components of the force within the Joint Operational Area (JOA) and address all aspects of the threat. Every effort needs to be made to optimise overall NBC defence posture through the harmonising of respective nations' capabilities at both the operational and tactical levels.

- d. **Prioritisation.** Notwithstanding that NBC defence needs to embrace the whole force, it is unlikely that the capability will exist to protect all elements of the force to the same degree. Priority then needs to be given to the force's operational Centre of Gravity (CoG). This may be tangible, for example key facilities, force elements, combat service support (CSS) assets, or intangible such as coalition cohesion or political will as influenced by public opinion.<sup>5</sup>
- e. **Flexibility.** Force NBC defence needs to be flexible, modular in application and capable of responding to a rapidly changing threat and operational environment and needs to take account of different national guidelines.

## Section IV - The Characteristics and Effects of NBC Weapons

0108. **Introduction.** A potential adversary<sup>6</sup> with an NBC capability may introduce NBC weapons and agents at any stage of a conflict. Their employment and effect will be governed by their technical characteristics, intended impacts on operations and environmental conditions. Capabilities may include nuclear and radiological weapons (RW), classic biological or chemical weapons and agents, or newly developed weapons and agents from the bio-chemical spectrum. Some agents may have been developed from commercially available toxic material and not considered previously as NBC weapons.

### Nuclear Weapons Characteristics and Effects

0109. **Nuclear Warfare.** Nuclear warfare is defined as warfare involving the employment of nuclear weapons.<sup>7</sup>

0110. **Nuclear Weapon.** A nuclear weapon is defined as a complete assembly (i.e. implosion type, gun type or thermonuclear type) in its intended ultimate configuration which, upon completion of the prescribed arming, fusing and firing sequence, is capable of producing the intended nuclear reaction and release of energy.<sup>7</sup> The degree of damage and the extent of hazards from nuclear weapon effects will depend upon the design, yield, height of burst, distance from ground zero, meteorological conditions and the vulnerability of the target.

0111. **Nuclear Weapon Effects:**

- a. **Flash.** The immediate flash from a detonation within the atmosphere gives a very short warning to forces in the local area to take cover from the subsequent nuclear effects. Flash can cause permanent or temporary blindness and dazzle, particularly at night. Secondary hazards will result from personnel who are blinded or dazzled whilst operating equipment and platforms, particularly in the air.

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<sup>5</sup> AJP-3 Chapter 3, paragraph 3025.

<sup>6</sup> The term 'adversary' is used throughout AJP-3.8 to cover enemy, belligerent, opponent, third parties and terrorists. It is possible that in some CRO situations there will be no adversary to the Joint Force.

<sup>7</sup> AAP-21.

- b. **Thermal.** Thermal radiation can cause severe burns to exposed skin and ignite local flammable material which can also cause burns. Thermal radiation can burn, distort or melt equipment and start fires which may also destroy equipment and resources. Uncontrolled fires in forest or urban areas can pose a significant hazard.
- c. **Blast and Shock.** Blast and shock can damage or destroy equipment, land and air platforms, supplies, field-defences, fixed installations and infrastructure. The shock wave from an on, or over, water detonation can roll over sea platforms and destroy submarines. The pressure front will be a hazard to personnel directly and indirectly through flying debris and the blow down of structures and trees. The destruction of urban areas and the blow down of wooded areas can create obstacles to movement.
- d. **Initial Nuclear Radiation.** In the tactical area of detonation, high levels of Initial Nuclear Radiation (INR) (typically well above 75 cGy per hour) are produced within the fireball which can cause immediate incapacitation and death. Neutron Induced Activity (NIA)<sup>8</sup> in the immediate vicinity of the detonation will also produce high levels of radioactivity and a local hazard area.
- e. **Fallout and Rainout.** The fallout of fission products from, and debris sucked up into, the fireball will spread a residual radioactive hazard. Radioactive fallout will spread on the prevailing winds and progressively decrease in intensity but form a widespread radioactive hazard. When a nuclear burst triggers rainout or washout in temperate regions, the precipitation is likely to be highly radioactive. A local radioactive hazard will form where the precipitation falls and where it collects and pose a significant liquid and ground-contaminating hazard.
- f. **Electromagnetic Pulse and Transient Radiation Effects on Electronics.** Within the atmosphere electromagnetic pulse (EMP) and transient radiation effects on electronics (TREE) are attenuated by the atmosphere and the damage potential of the other nuclear weapon effects will be more significant. However, even a relatively small (20 kiloton (KT)) burst outside the atmosphere (exo-atmospheric) has the potential to create EMP effects at operational or strategic depth. This will put all electronics and electrical equipment at risk. The nuclear radiation from the same burst can also put all satellites in space, within line of sight, at risk from TREE. Such effects will inhibit or damage all communications and electronic equipment, unless specifically hardened against these nuclear weapon effects.

### Biological Weapons Characteristics and Effects

0112. **Biological Warfare.** Biological Warfare (BW) is defined as the employment of biological agents to produce casualties in man or animals and damage to plants or materiel; or defence against such employment.<sup>9</sup> BW has previously been perceived to offer only limited

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<sup>8</sup> NIA is also sometimes known as Neutron Induced Gamma Activity (NIGA).

<sup>9</sup> AAP-21.

operational value because of long incubation periods, uncertain areas of effect and uncertain persistency. However, advances in biotechnology may now make possible the swift and covert production of significant quantities of agents tailored to task (and perhaps resistant to known detection and treatment means) and of vaccines for the protection of the potential adversary's own forces. BW agent production technology need not be complex and manufacture can be relatively cheap and on a small scale. Continued research may make delivery simpler and further reduce limitations on the operational use of BW. With advances in biotechnology and fermentation techniques, agents are likely to become more readily available to potential adversaries. One example is the development of bio-regulators which are defined as compounds produced by or present in the body of an animal, including man, which controls or mediates some essential bodily functions.<sup>10</sup>

0113. **Biological Warfare Agents.**<sup>11</sup> A biological agent is defined as a micro-organism (or micro-organism product (toxin)) which causes disease in man, plants or animals or causes the deterioration of materiel.<sup>12</sup> Whilst the greatest concern is with BW agents that can infect humans, they can also be used as a means of economic warfare or to deny the use of certain areas. They can be extremely potent and, in many cases, only a few micro-organisms are needed to infect an individual. However, incubation times can delay the onset of effects. Liquid or solid aerosols offers the most likely delivery means because agent viability may be significantly degraded by the dynamic forces involved in release from bursting munitions.
0114. **Biological Weapon Hazards.** A biological weapon is defined as an item of materiel which projects, disperses, or disseminates a biological agent including arthropod vectors.<sup>10</sup> Their effect on personnel will depend on their characteristics and the availability of countermeasures and the inherent susceptibility of the target population. Non-lethal agents may only have a temporary effect. Lethal and transmissible agents delivered under optimum circumstances can cause large numbers of casualties and place a severe burden on the Joint Force, Host Nation and home base medical services and logistics. It may prove difficult to detect and monitor a BW attack if the signs and symptoms are similar to naturally occurring diseases.
0115. **Naturally Occurring Diseases.** Naturally occurring biological hazards and indigenous diseases need to be considered, particularly during CRO. The breakdown of civilian infrastructure, large displaced and refugee populations, poor sanitation, and inadequate disposal of human remains from conflict or natural disaster can provide ideal conditions for the spread of biological hazards. Such hazards can be spread through contact with the local population, contaminated food and water, vermin, biting insects and other vectors.

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<sup>10</sup> AAP-21.

<sup>11</sup> Further information on BW agents is given in AmedP-6 (B).

<sup>12</sup> AAP-6.

## Toxins

0116. A toxin is defined as the poisonous product of a living organism; may also be synthesized.<sup>13</sup> Toxins vary in their potency but can be many more times toxic than chemical agents. They are faster acting than micro-organisms normally producing effects within several hours. They are likely to be disseminated in the same way as chemical agents. Certain highly lethal toxins may be employed in small scale and selective terrorist or covert attack.

## Chemical Weapons Characteristics and Effects

0117. **Chemical Warfare.** Chemical Warfare (CW) is defined as the employment of chemical agents to kill, injure, or incapacitate for a significant period of time, man or animals, and deny or hinder the use of areas, facilities or materiel, or defence against such employment.<sup>13</sup>
0118. **Chemical Agents.** A chemical agent is defined as a chemical substance which is intended for use in military operations to kill, seriously injure, or incapacitate man through its physiological effects. The term excludes riot control agents when used for law enforcement purposes, herbicides, smoke and flames.<sup>13</sup> Chemical agents can attack different physiological systems and variously enter the human body by ingestion, inhalation or through the eyes and the skin. They can be classified, for example, as blood, choking, nerve or blister agents. They can also be divided into lethal, damaging and incapacitating agents although there is not always a sharp dividing line between the effects. They can be delivered as vapour, liquid, solid or aerosol form. CW agents are likely to be employed to produce casualties (non-persistent) or contaminate ground and/or equipment (persistent). Both may have a similar effect on personnel.
0119. **Chemical Weapons Agent Effects.** The most useful operational classification of CW agents is in terms of their persistency. Some agents have a high volatility at ambient temperatures and only create a transient vapour hazard, whilst others have a lower volatility and create persistent liquid or solid hazards which can last for days or weeks, depending upon the meteorological conditions.

## Radiological Weapons Characteristics and Effects

0120. **Radiological Warfare.** Radiological warfare is defined as the employment of radioactive materials or radiation producing devices to cause casualties or restrict the use of terrain. It includes the intentional employment of fallout from nuclear weapons.<sup>13</sup>
0121. **Radiological Weapon.** A radiological weapon (RW) is defined as any device, including weapon or equipment other than a nuclear explosive device, specifically designed to employ radioactive material by disseminating it to cause destruction, damage or injury by means of the radiation produced by the decay of such material. Sometimes also described as a radiation weapon or radiation dispersal device.<sup>13</sup>

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<sup>13</sup> AAP-21

0122. **Radiological Weapon Effects.** RW can spread or disperse radioactive materials to produce contamination hazards. Radioactive material can be obtained from fissile material from nuclear weapon programmes; materials and waste from civil nuclear power programmes; irradiated material from nuclear research reactors; industrial and medical radioactive sources. An adversary is likely to use delivery means that maximise the dispersion of radioactive particles. These can include explosive dissemination, direct spraying or scattering, dispersal of solid or liquid aerosols downwind. Fire and smoke can also be used.
0123. **Radiological Weapon Hazards.** An adversary can use RW to produce (or threaten to produce) a radioactive hazard to inhibit or degrade the operations of NATO and allied forces. The hazards which result will need to be managed similarly to the radioactive hazards from a nuclear detonation. An adversary also has, depending on the sources of supply, an opportunity to select the type of radioactive material. The dissemination, for example, of an alpha emitting hazard may be more difficult for NATO forces to detect and may require specialist equipment and personnel.
0124. **Generic Radioactive Hazards.** Radioactive material from either nuclear weapons effects or RW can produce a variety of alpha and beta emitting particles and gamma radiation. Alpha emitting particles pose a significant internal hazard for personnel if inhaled/ingested. Beta emitting particles can cause 'beta burns' on exposed skin. Gamma radiation has a long range and is very penetrating. Radioactive materials have an effect on the human body by direct irradiation, through skin contamination, or via ingestion or inhalation and thus internal contamination. Whereas the external radioactive hazard can be removed or avoided, internal contamination cannot be removed from the body and continues to cause long term damage until the radiation source decays.
0125. **Radiation Effects.** The impact of radioactive hazards on personnel will depend on the amount of radiation received which is a combination of the level of radiation at the point of the exposure and the duration or time of exposure. Tables of effects are included in STANAG 2083 and can range from radiation sickness and death, a period of radiation sickness and recovery or no short-term effects. Radiation that does not produce acute effects is unlikely to have a significant impact on personnel in wartime. However, this is unlikely to be the case during all other types of conflict, when there is a need to comply with various international and national radiation protection regulations. Here exposure of Joint Force personnel to any radiation hazard needs to be managed in accordance with STANAG 2473<sup>14</sup> because of possible long term medical consequences (the principles of exposure management are addressed in paragraph 137 below). Certain population groups, for example young persons and women of childbearing age, are considered to be at additional risk from radioactive hazards.

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<sup>14</sup> The term 'Low Level Radiation (LLR)' is introduced in STANAG 2473 which includes all levels of radiation hazard above background. However, it has not yet been possible to agree a definition of LLR for AAP-21.

## Section V - Toxic Industrial Materials

0126. All nations possess some industrial capability. The greater the capability, the greater the use of an ever-expanding range of toxic chemical, biological or radioactive materials. Such materials retained within their planned manufacturing, storage and transport facilities do not pose a significant hazard. However, their intentional or accidental release within an area of possible conflict may affect the conduct of operations. Toxic Industrial Materials (TIM) is a generic term for toxic or radioactive substances in solid, liquid, aerosolised or gaseous form. These may be used, or stored for use, for industrial, commercial, medical, military or domestic purposes. TIM may be chemical, biological or radioactive and described as Toxic Industrial Chemicals (TIC), Toxic Industrial Biologicals (TIB) or Toxic Industrial Radiologicals (TIR).<sup>15</sup>
0127. The increasing use and occurrence of TIM means that in addition to facing NBC hazards, NATO forces may be exposed to toxic industrial hazards (TIH) released as a consequence of friendly or adversary action. TIH is the hazard resulting from the release by any means of toxic industrial material resulting in the contamination or irradiation of personnel or the environment, area or any particular object.<sup>15</sup> A TIH area is defined as an area containing toxic industrial material that has been released or has the potential for release into the environment with consequent impact on the conduct of military operations.<sup>15</sup>
0128. **Toxic Industrial Radiological.** Possible sources of Toxic Industrial Radiological (TIR) capable of producing radioactive hazards are: civil nuclear production, research, recycling and storage facilities; waste containment sites; industrial and medical sources; materials and sources in transit; stolen or smuggled nuclear weapons grade material. The characteristics of radioactive hazards produced will depend on type of radiation and the nuclide involved. The geographical area of spread of the hazards can vary dramatically according to the source and manner of release:
- a. The break down of core containment at a nuclear power plant can spread radioactive hazards widely on a scale similar to the geographic spread of fallout from a nuclear weapon release.
  - b. General damage to a nuclear facility, where containment is not breached, may release radioactive solids and fluids to contaminate the facility and aerosols to form a significant downwind hazard.
  - c. The spreading of nuclear waste or radioactive sources directly, through fire or explosively, can create areas of local contamination. Direct or explosive application is likely to cover a hundred or more square metres. Fire will spread radioactive smoke downwind over several square kilometres depending on the meteorological conditions.

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<sup>15</sup> AAP-21.



0129. **Toxic Industrial Biological.** The release of Toxic Industrial Biological (TIB) hazards can occur following an incident, an attack or collateral damage at a facility producing or storing infectious material. Possible facilities include hospitals and other medical installations and research, production, storage or recycling facilities for the pharmaceutical or agricultural industries.
0130. **Toxic Industrial Chemical.** Industrial chemicals can pose significant toxic hazards and can damage the human body and equipment. Many industrial chemicals are corrosive, flammable, explosive, or react violently with air or water; these hazards may pose greater short-term challenges than the immediate toxic effects. Most but not all TICs will be released as vapour or highly volatile liquid and can have both short-term and long-term health effects. Any exposure to these chemicals needs to be avoided if possible. The release of large volumes of hazardous industrial chemicals can produce environmental damage. An example list of TICs is given in STANAG 2909.

## Section VI - The Employment and Consequences on Operations of NBC Weapons

0131. **Introduction.** An adversary may seek to degrade the operational capability of a NATO force by the use of NBC attacks to produce immediate or enduring hazards. Many NBC weapon and ROTA hazards can degrade capability by their potential effect on personnel when NBC protection and countermeasures have to be adopted to avoid casualties. The strategic, operational or tactical consequences of such NBC events will depend on the type of conflict, timing and scale of effects.
0132. **Employment.** Delivery of NBC weapons may be achieved by a wide variety of means; examples include missile, aircraft and Unmanned Aerial Vehicle (UAV), artillery, portable aerosol generators or covert/unconventional means. Intentions may include use in offensive or defensive operations to obtain operational advantages. An adversary, without the same constraints as NATO, has many options:
- a. To apply information warfare and thus political pressure by the threat or claimed prior use of NBC weapons, or the claim of first use by NATO or a third party.
  - b. The terrorist, third party, covert or overt use of NBC weapons to raise the level of tension and put pressure on NATO to react. Such use may attempt to degrade the will and cohesion of alliance members and destabilise neighbouring states in the operational area. Such use may also seek to create regional instability, prompt major population movements so as to hamper the mobilisation, concentration, deployment, logistic support and manoeuvre of forces.
  - c. The use of NBC weapons in a final attempt to avoid defeat or even as a final act of revenge.
0133. **The Availability and Ease of Productions of NBC Weapons.** The production of nuclear weapons requires a large industrial infrastructure, an advanced technological base and links

to a civil nuclear programme. Few potential adversaries may have nuclear weapons and then only in very limited numbers. Conversely, Biological and Chemical weapons and agents are relatively straightforward to produce and can be made in existing civil facilities, assuming possession of a pesticide, pharmaceutical or biochemical industry. Therefore, potential adversaries could possess the ability to begin manufacturing Biological and Chemical weapons and agents relatively quickly; this would not be possible with nuclear weapons.

0134. **Types of Conflict.** The operational consequences of NBC hazards will vary with the type of conflict in which the deployed Joint Force is involved:

- a. Doctrine for Allied Joint Operations (AJP-01) is aimed primarily at the planning, conduct and support of combat operations. Such combat operations are normally mounted to counter the threat posed by an identified adversary and to defeat him by military means.
- b. The circumstances in which an allied Joint Force may be required to conduct CRO<sup>16</sup> are less clearly defined; threats and opposing elements may not be easily identified and the operation may involve many civilian, political, and humanitarian bodies and agencies.

0135. **Planning.** There is a critical need for up to date and relevant intelligence estimates, which include potential NBC weapon and TIM hazards, both before and during Joint Force operations. Commanders at all levels need to be capable of balancing the operational imperative with the need to avoid NBC hazards if encountered. Guidance on the maintenance of such a balance needs to be provided by the Strategic Command to the Joint Force Commander (JFC) during planning and updated during operations once NBC and TIM hazards are encountered. Guidance for subordinate commanders to cover possible different operational situations needs to be included in the JFC's concept of operations and in the operation order to reflect the particular nature of the likely operation. The application of international recommendations and different national legislation covering exposure of Joint Force personnel to NBC hazards also needs to be co-ordinated during planning and before deployment.

0136. **Other Agencies and the Host Nation.** In any conflict where NBC weapons may be used the Strategic Command and the JFC will also need to recognise possible impacts on any non-government organisations (NGOs) in-theatre and the Host Nation (HN). In CRO there may be a wide spread of other agencies through the JOA. If NBC events occur, assistance to NGOs and the Host Nation may divert resources from the Joint Force. Similarly operational capability may also be degraded if HN facilities and personnel used in support of the Joint Force are affected. If NBC events occur, the JFC may be called upon to provide support to NGOs and the HN. This may divert resources from the Joint Force.

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<sup>16</sup> CRO may include peace support operations, conflict prevention, peacekeeping, peace enforcement, peacemaking, peace building and humanitarian operations.

0137. **The Management of Exposure to NBC Hazards.** Exposure of forces to NBC hazards can have an immediate effect on personnel or affect their health or ability to survive subsequent exposures in the longer term. The JFC and all subordinate commanders are to avoid unnecessary exposure of personnel to NBC weapon or ROTA hazards. Where the avoidance of exposure is impractical because of other operational priorities, exposure is to be 'As Low As Reasonably Achievable'(ALARA). Exposures or suspected exposures to NBC hazards needs to be recorded to assist the short and possible long-term employment of personnel.

## **Section VII - NBC and Toxic Industrial Materials Impacts at Different Operational Levels**

0138. **The First Occurrence of an NBC Event.** The first use of NBC weapons by an adversary, or the first TIM release, may be anticipated if the proper planning and preparation of a Joint Force and Intelligence Preparation of the Battlespace (IPB) has been carried out. However, with the confirmed first occurrence of an NBC event within the JOA, an operational threshold is crossed and the nature of the conflict may significantly change. A reassessment of the operation will need to be conducted by the Strategic Command and direction given to the JFC:
- a. To continue the mission as before.
  - b. To continue the mission but in a modified form to minimise the impact of the NBC event or events.
  - c. Or the NBC hazards are so severe that the operation cannot continue.
0139. The use of NBC weapons by an adversary and a significant TIM release in the JOA is likely to produce intense media interest, have a significant impact on public opinion and generate considerable political consequences. The discussion which follows concentrates on the purely military impacts.

## **Nuclear Weapon Consequences**

0140. Strategic Implications:
- a. The detonation of a nuclear weapon by any adversary will have an immediate and major impact at the highest political and strategic levels. Those nations with nuclear weapons and a credible first strike delivery means maintain the capability to deter direct nuclear attack and possibly conventional attack. However, a nuclear strike capability is unlikely to provide a credible deterrent against asymmetric terrorist, third party or covert attack.
  - b. A nuclear detonation outside the atmosphere can have a significant strategic impact in that electromagnetic effects have the potential to destroy or degrade all unhardened

military, industrial and commercial electronic information technology (IT) equipment across a strategic theatre.

- c. The fallout from even a single weapon detonation, possibly in an adjacent and unconnected theatre, can spread on the wind across the JOA. The resulting radiation hazard will be significant because of the need to avoid exposure to ionising radiation. Such hazards may put the operation at risk.

0141. **Operational Implications.** A significant proportion of the Joint Force assets are likely to be deployed to assist in post-strike recovery. The fallout from the nuclear detonation will cover a portion of the JOA and measures to manage the hazard and the exposure of all personnel in the area will be needed. The continued operational capability of the Joint Force will inevitably be degraded. There is likely to be a considerable strain on medical and logistic resources.

0142. **Tactical Implications.** In the area of a nuclear detonation the operational capability of the Joint Force will be seriously degraded. Degradation will not only be caused by the loss of personnel, equipment and resources but also the need to rescue and treat injured force personnel and to fight possible fires. The blocking of routes by debris and trees may also degrade recovery and there will also be a need to deploy assets to assist other agencies and the Host Nation. The immediate area of the nuclear detonation is likely to be highly contaminated and movement, except to save life, severely limited.

### **Biological Warfare Consequences**

0143. **Strategic Implications:**

- a. BW can be well suited to asymmetric terrorist, third party or covert attack. An adversary can select the time of dissemination to allow for incubation, possibly prior to the overt commencement of conflict. Early use of BW weapons in a conflict may put at risk the process of mobilisation of resources, transit and deployment to the JOA. The spread of disease or illness to civilian populations at the home base and then in the Host Nation may degrade logistic support and the efficient arrival of the Joint Force in-theatre. The plans and timetable of the Strategic Command and the JFC may be put at risk.
- b. In addition to first use, BW hazards will have strategic implications because suitable agents can be spread on the prevailing wind across large geographic areas. Once infected, personnel can spread transmissible agents further. A disease has time therefore to spread and take hold before incubation is complete and the symptoms of acute illness, and signs of a possible BW attack, are recognised.

0144. **Operational Implications.** The potential impact of BW attacks at the operational level can be both wide-ranging and significant. Particularly if detection and identification of an attack proves difficult and countermeasures difficult to find. Large numbers of casualties can reduce the operational capability of the Joint Force, reduce morale and will divert medical

and logistic resources from current operations. Both may reduce operational tempo. Precautionary Restriction of Movement (ROM) measures may also reduce tempo.

0145. **Tactical Implications.** There will be some loss of operational capability by those forces remaining in or near BW hazard areas. This will be caused by the need to:

- a. Remain in NBC protection for long periods of time.
- b. Maintain frequent and regular health monitoring of personnel, increased standards of hygiene and the protection of rations and water.
- c. Avoid the use of areas and assets which may be contaminated.

### **Toxins**

0146. Toxins are likely to be disseminated in the same way as CW weapons and can be considered to pose similar hazards. They are therefore included with CW hazards.

### **Chemical Warfare Consequences**

0147. Strategic Implications:

- a. CW hazards are unlikely to have strategic implications because of the very large amount of agent and delivery capacity needed to contaminate large geographical areas.
- b. The selective use of persistent CW agents to contaminate the Points of Embarkation (POE), Point of Disembarkation (POD), Forward Mounting Base (FMB) and choke points in the Lines of Communication (LoC) can have a strategic impact because the deployment of the Joint Force may be disrupted and the Strategic Plan delayed. Potential adversaries may use asymmetric terrorist, third party or covert attack before any conflict has begun.
- c. The use of CW agents on forces poorly equipped and/or trained for NBC Defence can inflict high casualties and degrade operational capability. The need to recover and replace these forces will put operational plans and aims at risk. Such casualties are likely to have significant consequences at the Strategic Level.

0148. **Operational Implications.** CW can be used to contaminate ground and resources with persistent chemical hazards. Non-persistent vapour hazards, and the vapour from persistent contamination can spread downwind and can pose a hazard over a significant area of the JOA, given the right meteorological conditions. Commanders will need to consider the avoidance and evacuation of the hazard areas. CW protection will be needed for forces that remain in the area. Operational capability and tempo is likely to be degraded because of the need for the Joint Force to adopt NBC Defence detection, warning, protection and control measures.

0149. **Tactical Implications.** Forces remaining in or near CW hazard areas will probably need to remain in NBC protection for long periods of time. This can cause significant loss of operational effectiveness, as follows:

- a. Cause personnel to work in Individual Protective Equipment (IPE) and degrade performance, increase fatigue and possibly lower force cohesion and morale.
- b. Reduce the overall speed, cohesion and freedom of movement of forces in the local area because of contaminated areas and assets.
- c. Restrict the local use of ground and operational assets, cause resource-intensive decontamination of key assets and distort the logistics chain.

### **Radiological Weapon Consequences**

0150. **Strategic Implications:**

- a. Except for first use, RW hazards are unlikely to have strategic implications because a large amount of material and delivery capacity is needed to contaminate large geographical areas. However, the selection and covert dissemination of an alpha emitting hazard may be difficult for NATO forces to quickly detect and the hazard can rapidly spread by pick up and transfer and contaminate ports, routes and facilities. Once detected all personnel will need respiratory protection and specialist equipment and personnel may be needed to control the hazard.
- b. The selective use of RW and the consequent radioactive hazards to contaminate the POE, POD, FMB and choke points in the LoC can have a strategic impact because the deployment of the Joint Force may be disrupted and the Strategic Plan delayed. Potential adversaries may use asymmetric terrorist, third party or covert attack before any conflict has begun.

0151. **Operational Implications.** RW can be used to contaminate ground and resources with radioactive hazards. Commanders will need to consider the avoidance and evacuation of the hazard areas, particularly during CRO. Radiological protection will be needed for forces that remain in the area. Operational capability and tempo is likely to be degraded because of the need for the Joint Force to adopt NBC Defence detection, warning, protection and control measures.

0152. **Tactical Implications.** There will be some loss of operational capability by those forces remaining in or near radiological hazard areas. This will be caused by the need to:

- a. Remain in NBC protection for long periods of time.
- b. Manage exposure to radioactive hazard and rotate personnel.
- c. Avoid the use of contaminated routes, areas and assets and decontaminate key assets.

**Toxic Industrial Material Consequences**

0153. **Strategic Implications.** TIM are unlikely to have strategic implications because of the very large amount of material needed to effect large geographical areas. However, the break down of core containment in a major nuclear facility has the potential to spread a large number of highly radioactive fission products across the whole strategic area and put the operational mission at risk.
0154. **Operational Implications.** The sites of significant TIM facilities in the JOA need to be plotted and, whenever and wherever possible, avoided during operations. Contingency plans need to be made with the Host Nation to control and contain the hazards if TIM facilities are damaged. Whatever the circumstances of a TIM release, the impact on military capability will need to be assessed. A large-scale release from TIM facilities, particularly if there are also large fires, has the potential to spread toxic aerosols and smoke across a significant percentage of the operational area. Such hazards will need to be avoided by the Joint Force or protection will be needed, particularly during CRO. This is likely to restrict the freedom of action of the Joint Force and may degrade operational tempo. Damage to nuclear facilities, without a breach to core containment may also spread radioactive aerosols and smoke.
0155. **Tactical Implications:**
- a. Forces that remain in the area will probably need to adopt protection. It is possible that because of the nature of the TIH, countermeasures may not be within the NBC defence capability of the Joint Force. In this case a specialist hazardous material capability will be needed either from the Host Nation or from outside the theatre.
  - b. If conflict takes place in the area of TIM storage facilities, the risk of collateral damage and the release of TIH needs to be assessed. Disused industrial sites with hard standing and warehouses often provide ideal logistic facilities but need to be checked for all forms of TIM before use. Particular note of TIH needs to be taken when accommodation for personnel is selected.

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## CHAPTER 2 - THE PRINCIPLES AND COMPONENTS OF NUCLEAR, BIOLOGICAL, AND CHEMICAL DEFENCE

### Section I - Introduction

0201. This Chapter sets out the principles for the conduct of NBC Defence at the operational level. The NBC Defence capability needed by a Joint Force is grouped, by function, into 5 components. The Chapter also addresses the related capabilities of NBC defence equipment and training and evaluation and the general capabilities of Communication and Information Systems (CIS) and Logistics.

### Section II - NBC Defence Principles and Components

0202. Principles for the application of NBC Defence measures in support of Joint Force operations are as follows:

- a. **Intelligence Assessment.** A current, comprehensive and accurate intelligence assessment of the NBC threat and Toxic Industrial Hazards (TIH) in a Joint Operations Area (JOA) provides the essential underpinning or foundation for all other measures. This assessment must be regularly updated.
- b. **Force Preparation.** The components of the Joint Force need to be well prepared for NBC Defence in terms of the appropriate doctrine, equipment, procedures, organisation and training (STANAGs 2150 and 2352). These NBC Defence measures need to be prepared before deployment so that the necessary operational capability is present in-theatre. Such preparations are also to deter potential adversaries from considering the use of NBC weapons or Toxic Industrial Materials (TIM).
- c. **Risk Management.** A complete response to the wide range of potential NBC and Release Other Than Attack (ROTA) risks is unrealistic. Risks need to be anticipated, planned for, recognised and managed so that freedom of action can be maintained across the JOA.
- d. **Flexibility, Integration and Co-ordination.** The NBC threat can be diverse and wide ranging so the Joint Force's response needs to be flexible in application. In addition, the NBC Defence posture necessary to meet the threat needs to be coherent across all components of the Joint Force through close co-operation and co-ordination. Where possible, integration needs to be extended to embrace the Host Nation and other agencies in-theatre.
- e. **Sustainability.** NBC events may place additional burdens on the sustainability of the Joint Force. NBC Defence will require additional logistic resources and attacks may degrade the functioning of the supply chain. The Joint Force logistic plan will need

to address the inherent vulnerability of fixed assets and facilities to NBC events at entry points into theatre and on lines of communication (LoC) by the use of protection and redundancy.

0203. **The Components of NBC Defence.** NBC Defence is divided into 5 enabling components. The foundations for these components are established prior to operations by the development of appropriate NBC policy, doctrine, equipment, procedures and training. The 5 components are:

- a. **Detection, Identification and Monitoring.** These are needed to detect and characterise NBC events, identify the agents and hazards, delineate areas of contamination, and monitor the changes.
- b. **Warning and Reporting.** These are needed to aid the rapid collection, evaluation and dissemination of data concerning NBC attacks and hazards, including the prediction of hazard areas. The dissemination of data and the prediction of hazards is carried out using CIS.
- c. **Physical Protection.** Individual and Collective Protection (COLPRO) are required so that personnel can survive NBC attacks or ROTA and continue to operate in an NBC hazard environment. Measures to protect equipment are also included.
- d. **Hazard Management.** This is needed to limit the operational impact of NBC hazards. Hazard management is based on the principles of pre-hazard precautions and hazard control through avoidance, control of spread, exposure control and decontamination.
- e. **Medical Countermeasures and Support.** These are needed both to diminish the susceptibility of personnel to NBC hazards and to treat and evacuate casualties. The treatment and evacuation of conventional casualties in an NBC environment is included.

### Section III - Detection, Identification and Monitoring

#### Detection

0204. Detection (NBC) is defined as the discovery by any means of the presence of a chemical or biological agent or radioactive material, of potential military significance.<sup>1</sup> The equipment and procedures needed to detect events and protect against them must be made ready and rehearsed at appropriate threat levels so that hazards can be detected at the earliest possible opportunity and timely alerts and/or alarms given. The detection component also includes reconnaissance, survey, and surveillance.

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<sup>1</sup> AAP-21.

0205. **Detectors.** An NBC detector is defined as a device or system, including the observation of living organisms, employed to recognize the emergence, presence or absence of NBC warfare events or hazards.<sup>2</sup> Detectors are divided into:<sup>2</sup>
- a. **Point Detector.** A detector that reacts to hazards at the point of interception.
  - b. **Stand-Off Detector.** A detector that reacts to distant events or hazards.
  - c. **Remote Detector.** A Point or Stand-Off detector employed at a distance from the protected force element.
0206. **Detection Capability.** Point Detectors may range from vehicle-mounted, crew-served and fully capable systems to man portable devices intended only for immediate indication of attack. Whatever the precise format, they are only able to test the atmosphere at the point of sampling. Advance warning is thus achieved by placing the equipment upwind of the bulk of personnel at risk but downwind of the anticipated point of release. Inevitably, this imposes costs in terms of physical vulnerability, routine maintenance, periodic relocation and the numbers required. Where Remote Point Detectors are available these difficulties will be eased. For the future, Stand-off Detectors will dramatically improved the timeliness of hazard recognition. In the interim, commanders and staffs will need to make careful choices in the employment of detection equipment, balancing the full utilisation of their inherent capabilities against limited numbers and restrictions on geographical dispersion.
0207. **Biological Warfare Agent Detection by Disease Surveillance.** In addition to the detection capability given above, Biological Warfare (BW) agents can be detected through the systematic, large scale and regular health monitoring of Joint Force personnel and, where possible and applicable, the Host Nation population. Changes in health patterns can be targeted and analysed for the early signs and symptoms of disease or illness induced by BW agents.
0208. **NBC Surveillance.** NBC surveillance is defined as the systematic observation of aerospace, surface areas, places, persons, or things by visual, electronic, mechanical, or other means for determining the presence or absence of NBC hazards.<sup>2</sup> The integration of detection reports via the Warning and Reporting process, described in Section IV below, facilitates early warning.
0209. **Reconnaissance and Survey.** Reconnaissance and Survey techniques are used to validate and supplement initial detection reports, specifically:
- a. **NBC Reconnaissance.** NBC Reconnaissance is defined as a mission undertaken to obtain information by visual observation or other methods, to confirm or deny the presence of NBC hazards or attacks. It may include gathering information on enemy

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<sup>2</sup> AAP-21.

use of NBC weapons, associated hazards, or meteorological data for NBC hazard prediction.<sup>3</sup>

- b. **NBC Survey.** NBC Survey is defined as the directed effort to determine the nature and degree of NBC hazards in an area of confirmed or suspected contamination, and to delineate the boundaries of the hazard area. This may include monitoring the degree of radiation or the presence of a biological or chemical hazard, and the sampling of items suspected of NBC contamination.<sup>3</sup>

### **Sampling and Identification of Biological, Chemical and Radiological Agents Operations**

0210. Sampling and Identification of Biological, Chemical and Radiological Agents (SIBCRA) is defined as the collection, transportation and identification of suspected chemical, biological and radioactive materials within a chain of custody. Where employed in single hazard environments, the derivative terms SIBA, SICA and SIRA may be used.<sup>3</sup> There is an operational need for SIBCRA to identify NBC hazards and to confirm, by forensic techniques, the unequivocal use of NBC weapons and agents by an adversary. This degree of certainty cannot be achieved by information obtained solely from operational NBC sensors or unusual numbers of casualties. Although such evidence is often required quickly, the proof of use of these agents must be such that it cannot be refuted. Only when the information is combined with samples from the field, their history and analytical evidence from the identifying laboratory can irrefutable evidence be provided:

- a. To the Strategic Command to support timely Alliance decisions in response to such NBC attacks and to identify possible international treaty violations.
- b. To allow the JFC to make timely and informed decisions on the positioning, operating posture, hazard management, tempo and maneuver ability of the Joint Force.
- c. So that the Medical Services can provide the most appropriate health care for casualties and determine the most appropriate protective actions to implement health protection for the Joint Force.
- d. In the longer-term, such information is needed for site decontamination and eventual recovery.

0211. **Sampling.** Sampling is defined as the retrieval for analysis of material known or suspected to have been employed in an NBC attack or to have arisen from ROTA.<sup>3</sup> Sampling needs to be conducted by trained personnel so that there is uniformity, viability, safety, and accountability in the sampling procedures. Sampling is only to take place when an attack or release is indicated and, other than medical pathological sampling, initiated as directed by the NBC staff.

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<sup>3</sup> AAP-21.

0212. **Identification.** Identification (NBC) is defined as the determination of the identity of an agent or material employed in a NBC attack or resulting from ROTA.<sup>4</sup> The exact criteria for each form of identification for each type of agent are detailed in AEP 10 and AEP 49. There are 3 types of identification with varying degrees of reliability:

- a. Provisional identification (presumptive) providing for immediate needs only.<sup>5</sup>
- b. Confirmed identification which is permanent and unlikely to change.
- c. Unambiguous (forensic) where classification is beyond doubt.<sup>6</sup>

0213. **Identification Purposes.** Identification is conducted for 2 purposes:

- a. Identification/classification by NBC forces to support the commander's decision making process in accordance with STANAG 2112 by:
  - (1) Confirming that an attack has taken place.
  - (2) Determining the medical treatment for personnel exposed to the agent.
  - (3) An estimate of the number and type of casualties.
  - (4) The evaluation of an adversary's NBC capability.
  - (5) The evaluation of the impact on operational tempo.
- b. Identification carried out by an accredited laboratory. This is to confirm the presence and character of the NBC hazard from the samples collected by specialist teams in accordance with AEPs 10 and 49. Such identification can only take place either at an accredited laboratory in-theatre or in national laboratories. If samples are to be used as forensic evidence the appropriate chain of custody needs to be employed.

## Monitoring

0214. Monitoring is the continuous or periodic process of determining whether an NBC hazard is present. NBC hazards can be significantly affected by a number of factors including weather, terrain, time of day and agent decay. Surface monitoring is conducted on personnel, equipment, or terrain to establish the presence of surface contaminants and to validate decontamination. Monitoring assists the commander to determine the protective posture of the force.

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<sup>4</sup> AAP-21.

<sup>5</sup> From the Concise Oxford Dictionary.

<sup>6</sup> From the Concise Oxford Dictionary where 'un' is the contrary case and 'ambiguous' is of doubtful classification or of uncertain issue.

## Section IV - NBC Warning and Reporting

### Alarm

0215. Alarm is defined as an indication from any source that a NBC attack or ROTA may have occurred.<sup>7</sup> Once an NBC attack and/or TIM is detected, the alarm needs to be raised at all levels of the Joint Force as soon as possible so that timely and appropriate protective measures can be taken. Emergency signs and alarms are given in STANAG 2047. Alarms need to be passed rapidly over CIS using the procedures agreed in STANAG 2103 (ATP 45). Alarm functions need to be capable of being set and reset to take account of subsequent changes in the level of risk. Warning is defined as a command approved statement that a NBC attack or ROTA has occurred or is presumed to have occurred.<sup>7</sup>

### Warning and Reporting

0216. Warning and Reporting is defined as the process by which reports of NBC attacks or ROTA are forwarded through the chain of command and units are warned of the resulting hazards. The process is coordinated by a hierarchical structure of NBC centers.<sup>7</sup> Commanders and staffs at all levels need to assess the impact of NBC events on their plans and decisions on the basis of timely, accurate and evaluated NBC information. Collection, evaluation and exchange of information on NBC incidents are significant contributors to effective NBC defence. An NBC Warning and Reporting capability is required, in accordance with STANAG 2103/ATP 45, to ensure timely provision of the most accurate data on NBC events and the resulting hazard areas.
0217. The purpose of the NBC Warning and Reporting procedures, as laid down in ATP 45 are the:
- a. Reporting of all NBC events, ROTA and the resulting hazards.
  - b. Predicting and warning of hazard areas from NBC events.
  - c. Evaluation of NBC information so that an assessment can be made of the influence of NBC events on operations.
  - d. Interchange of reports between the components of the Joint Force and national military and civil authorities and agencies.
0218. NBC reports and messages need to be sent by the quickest means available to all components of the Joint Force that are, or may be, affected by NBC hazards. Where possible the speed and accuracy of the Warning and Reporting system needs to be enhanced by the use of Automated Data processing (ADP) and CIS. This Warning and Reporting information needs to become an integral part of planning for future operations by commanders and staffs.

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<sup>7</sup> AAP-21.

0219. **NBC Warning and Reporting Areas.** A Joint Force needs the following Warning and Reporting Areas and Zones (ATP 45):

- a. **NBC Area of Observation.** An NBC Area of Observation is defined as a geographical area, normally based on the boundaries of a nation state or theatre of operations, within which NBC Warning and Reporting is conducted under the supervision of an NBC Area Control Centre. A single area of observation may be divided into a number of subordinate Zones of Observation.<sup>8</sup> The Area is normally equal to a country or Host Nation (HN).
- b. **NBC Zone of Observation.** An NBC Zone of Observation is defined as a geographical sub-division of a NBC Area of Observation.<sup>8</sup> This is the area which defines the responsibility for collecting and reporting information on adversary or unidentified NBC events and the resulting hazards. Zones must cover the geographical area defined by the Area of Observation.

0220. **NBC Warning and Reporting Centres.** An NBC Centre is defined as an organizational entity holding responsibility for NBC Warning and Reporting within a hierarchical structure comprising, in descending order, Area Control Centres (NBC ACC), Zone Control Centres (NBC ZCC), Collection Centres (NBC CC) and Sub-Collection Centres (NBC SCC). Ordinarily, Area and Zone Control Centres are geographically dependent, whereas Collection and Sub-Collection Centres are integral to military formations.<sup>8</sup>

0221. NBC ACCs and ZCCs are territorially dependent and will normally be established at national commands (Host Nation MOD level). The national NBC ACC needs to be in close contact with the senior Joint Force NBC Cell. If there is no national Warning and Reporting structure, an NBC ACC and NBC ZCCs will need to be set up by the Joint Force.

0222. **NBC Source Level.** The NBC Source Level is defined as observation posts, survey and reconnaissance teams, sites, formations, units, or any other agency which recognizes and reports NBC attacks or ROTA.<sup>8</sup>

## Section V - Physical Protection

0223. Individual protection and COLPRO enhance survivability but can restrict freedom of operations. Therefore, commanders need to reconcile the vulnerability of the Joint Force to NBC hazards with the restrictions of protective measures and the pursuit of the mission. This vulnerability analysis determines the levels of physical protection to be adopted. STANAG 2133 establishes common methods for conducting vulnerability analysis of BW and CW threats. Graduated levels of NBC threat and associated protection are given in STANAG 2984.

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<sup>8</sup> AAP-21.

0224. **Risk Assessment.** The purpose of risk assessment in a NBC environment is to reduce degradation and improve operational efficiency. The risks involved will change with time and will need to be reviewed regularly. The factors that need to be considered are:
- a. **NBC Threat.** Responsibility for establishing NBC threat levels rests with the JFC. Local commanders have the authority to determine the appropriate level of NBC physical protection, based on their assessment of local conditions, the associated protective measures and the operational imperative of the situation at the time.
  - b. **Operational Task.** The greater the priority and urgency afforded to the task in hand, the higher the risk which may need to be run to ensure that over-protection does not hinder effective and timely completion of the mission.
  - c. **Location of Personnel.** While the disposition of personnel will affect their chances of being targeted with NBC weapons, the physical protection afforded by their location will influence their vulnerability. Personnel under cover and unlikely to be exposed to surface contamination may not need to wear NBC overboots or gloves, while those in COLPRO will not necessarily need to wear Individual Protection Equipment (IPE).
  - d. **Weather Conditions.** Temperature and weather are crucial factors that influence the degree of heat stress imposed by wearing IPE.
  - e. **Nature of Work Undertaken.** The physical effort of a task has a direct effect on the level of degradation imposed by IPE. If a high workload is combined with high temperatures there will be a risk of heat stress casualties, particularly if there is insufficient water intake.

### Individual Protection

0225. Individuals need to be provided with an individual respiratory protection system, prophylaxis/pre-treatment medications, antidotes, a decontamination kit, a first aid kit, and protective clothing to protect against NBC hazards. Commanders need to be aware that there may be significant limitations of IPE and respirator limitations against certain threats including TIH. The exposure of personnel to NBC or TIM hazards needs to be continuously monitored and recorded so that the appropriate medical management, support and after-care can be arranged.

### Collective Protection

0226. NBC COLPRO is defined as the protection provided to a group of individuals in a NBC environment which permits relaxation of individual NBC protection.<sup>9</sup> The purpose of COLPRO is to allow the continued performance of operational functions in the presence of

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<sup>9</sup> AAP-21.



NBC hazards; it may also be used to provide rest and recuperation. COLPRO facilities offer a means of countering the psychological and physiological effects that result from the extended use of IPE.

0227. **Collective Protection Categories:**

- a. **Fixed.** Fixed COLPRO is defined as COLPRO systems integral to static facilities; these may be hardened, semi-hardened or unhardened.<sup>10</sup>
- b. **Mobile.** Mobile COLPRO is defined as COLPRO systems integral to land, sea or air platforms. They may or may not be capable of operation on the move or of allowing entry and exit in the face of chemical, biological or radioactive hazards.<sup>10</sup> The Citadel on board ship is defined as group of interconnecting compartments which can be included together within a vapour tight boundary within which air can be re-circulated to provide COLPRO.<sup>10</sup>
- c. **Transportable.** Transportable COLPRO is defined as stand-alone COLPRO systems capable of being deployed into an area of operations. They will usually be unhardened (UCP) but may be capable of erection within buildings or other enclosures.<sup>10</sup> UCP can also be used within ships which do not have built-in COLPRO.

0228. **Protection.** COLPRO provides adequate protection against airborne NBC hazards and may also, depending on design and placing, resist some forms of surface contamination. However, commanders need to be aware that:

- a. Limited biological detection capability may prevent the accurate assessment of BW agent contamination of individuals and thus impose limitations on entry into COLPRO after the arrival of a hazard. This risk will be particularly pronounced in cases where transmissible agents are employed with COLPRO thus acting as a focus for secondary infection.
- b. In the presence of immediate or deposited radiation hazards, the protection afforded by the COLPRO will be conditioned by the density of the surrounding platform or structure. It is unlikely that Transportable COLPRO will offer any significant resistance to the passage of ionising radiation.
- c. COLPRO filters may not be effective against high concentrations of TIH which displace oxygen and may provide only limited protection against some TIM compounds.

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<sup>10</sup> AAP-21.

## Equipment and Materiel Protection

0229. **Nuclear Survivability of Equipment.** Mission essential equipment needs to be made nuclear survivable. Criteria need to be applied to enhance survival against blast, thermal, initial nuclear radiation, Electromagnetic Pulse (EMP), Transient Radiation Effects on Electronics (TREE), ground shock and water shock as applicable. Protective features that meet these survivability criteria need to be incorporated at the design stage of all-future land, sea and air platforms and equipment. Existing land, sea and air platforms and equipment need to be modified, as necessary, at an appropriate time in their operating cycle. In some circumstances, in particular with information technology (IT) equipment, redundancy may be an alternative to nuclear hardening. Experience has shown that most items are part of a man-machine combination where the human operator is necessary for the equipment to perform its intended function. The basic principle, set out in STANAG 4145 and AEP 4, is that the equipment needs to be designed to survive at levels where the associated personnel will remain combat effective long enough to perform the mission.
0230. **NBC and Toxic Industrial Materials Contamination Hardening of Equipment.** All mission essential land, sea and air platforms and equipment which may risk becoming contaminated need to be hardened as set out in AEP 7. Hardening comprises the smoothing of surfaces, the use of resistant materials and the covering of joints and enclosures. Hardening is needed so that equipment surfaces resist penetration by NBC contamination, particularly liquid CW agent, and resist the potentially damaging effects of decontaminants and decontamination methods.
0231. **Crew Duties.** Platforms and equipment needs to be designed so that once contaminated they can be operated by crews dressed in full NBC IPE and only the minimum surface needs to be decontaminated (operational) to continue the mission.
0232. **Mitigation Techniques.** The survivability of equipment against NBC weapon effects needs to be maintained by the correct operational use of equipment. The following mitigation techniques or 'good practice' needs to be followed:
- a. **NBC Contamination.** The contamination and penetration of equipment surfaces can be avoided if the cover provided by buildings, chemically resistant materials or camouflage is used and all doors and hatches are kept closed.
  - b. **Nuclear Electromagnetic Pulse and Transient Radiation Effects on Electronics.** Penetration by EMP and TREE into equipment can be minimised if all enclosures are kept shut, cables runs are as short as possible and not elevated, unused equipment is switch off and disconnected and any unauthorised electrical modifications removed.

## Section VI - Hazard Management

0233. **Introduction.** Residual NBC hazards are covered in this section. The more immediate and damaging weapon effects are covered in Section IV to Chapter 1. Hazard Management is

based on the principles of Pre-hazard Precautions and Hazard Control. Once personnel or their equipment, vehicles or stores come into contact with hazards, IPE may need to be worn for a prolonged period. Wearing IPE degrades operational performance so its wear should be kept to a minimum, both in terms of the amount of equipment worn and duration. The principle means of countering these difficulties is to avoid hazards and the risk of becoming contaminated. If decontamination does become necessary, it needs to be undertaken as quickly as other operational priorities allow. Hazard management needs to be an integral part of all operational planning and, as far as possible, be prepared well in advance. The measures that need to be considered are:

| <b>Pre-Hazard Precautions:</b>  | <b>Hazard Control:</b>  |  |
|---|---|--|
| Use of Cover<br>Camouflage<br>Concealment<br>Dispersion<br>Deception<br>Pre-wetting<br>Redundancy | <b>Hazard Avoidance</b><br>Marking<br>Movement Control<br>Route Planning<br>Relocation                                | <b>Exposure Management</b><br>Exposure Control<br>Data Recording<br>Rotation of Assets |
|   | <b>Control of Spread</b><br>Limitation of Spread<br>Hazard Containment<br>Restriction of Movement<br>Waste Management | <b>Decontamination</b><br>Passive<br>Active<br>Types<br>Principles                     |

0234. **Types of Hazard.** The types of hazard which follow derive from NBC weapons, ROTA and TIM:

- a. **Radioactivity.** Radioactive hazards cannot be destroyed but the radioactivity will decay naturally at a fixed rate which cannot be hastened (rates are given in AEP 49).
- b. **Biological.** The properties and persistency of different biological hazards vary greatly. Sunlight or extremes of temperature may rapidly destroy some biological hazards; others may persist for long periods.
- c. **Chemical.** Chemical vapour poses a transient hazard as it moves downwind. Solids pose a contact hazard as they decompose. Liquid chemicals constitute a contact hazard but they may also evaporate and produce a vapour hazard ('off-gassing'). Many materials also absorb liquid chemicals and once absorbed they will continue to generate a residual vapour hazard. Chemicals will evaporate eventually and leaving them to do so is weathering or passive decontamination (see below). The speed with which a chemical weathers will vary according to the type, concentration, the surface on which it lies, the ambient temperature, the humidity, the time of day and the wind speed.

0235. **Types of Contamination.** Contamination is defined as the deposit, absorption or adsorption of radioactive material, or of biological or chemical agents on or by structures, areas, personnel or objects.<sup>11</sup> Furthermore, any activity within a contaminated area which causes particles or liquid to be disturbed will cause a secondary hazard as they are carried away by the wind or in running water. Most decontamination waste products will form a secondary toxic hazard. Consequently, the following types of contamination resulting from an NBC weapon or ROTA incident may be encountered:

- a. **Surface.** Surfaces contaminated by liquid or solid hazards.
- b. **Air.** Air contaminated by vapour, or liquid or solid aerosols.
- c. **Water.** Water contaminated by liquid or solid hazard.
- d. **Secondary Contamination.**

#### **Pre-Hazard Precautions**

0236. **Introduction.** Pre-hazard precautions are needed so that forces minimise the possibility of being targeted by NBC weapons, and should an NBC event occur, NBC weapon effects are minimised by the precautionary measures taken.

0237. **Use of Cover.** Hardened shelters, buildings and ships' citadels provide the best cover against all forms of hazard but any type of overhead cover provided by an impermeable material is worthwhile. Failing this, tarpaulins, ground sheets and even camouflage nets will provide limited protection from contamination. However, the coverings need to be removed as soon as possible after the hazard has stopped falling before it can penetrate. Contaminated covers need to be removed carefully to avoid creating a secondary hazard.

0238. **Camouflage, Concealment, Dispersion, Deception.** The strict application of camouflage, concealment and dispersion of the Joint Force and deception techniques will do much to avoid discovery and potential targeting for NBC attack or ROTA. However, these measures will be more difficult to implement at fixed installations (see paragraph 248 below).

0239. **Pre-Wetting for Ships.** Pre-wet is defined as the fitted water spray system which enables a ship to wet and wash down all upper deck surfaces as a means of protection from NBC contaminants.<sup>12</sup> This reduces significantly potential residual contamination.

0240. **Redundancy.** The impact of NBC hazards on a force can be minimised if a degree of redundancy can be planned. This principle can operate at all levels. Reserve force assets (combat and service support) need to be earmarked and protected to be ready to replace and relieve contaminated forces. Reserve or spare equipment items need to be held to replace

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<sup>11</sup> AAP-6.

<sup>12</sup> AAP-21.

contaminated or damaged equipment. Spare line replacement units need to be held on platforms to replace those sub components that may be degraded or damaged by NBC contamination or nuclear electromagnetic effects.

## **Hazard Control**

0241. **Introduction.** The most effective hazard control measure is to avoid hazards and the risk of becoming contaminated; this will obviate or forestall the need for any other measures. However, this may not be easy to achieve because operational demands may result in the unavoidable exposure of forces.

0242. **Hazard Avoidance.** Hazard avoidance measures comprise:

- a. **Marking.** Stores, equipment and areas of ground that are known to be contaminated, need to be marked (STANAG 2002) so they can be avoided.
- b. **Movement Control.** Movement control measures are needed to prevent forces from moving into hazard areas. This is achieved by the use of a hazard control line, or "clean-dirty line", and associated hazard control points to control or prevent movement into a hazard area.
- c. **Route Planning.** Informed route planning can reduce the danger of picking up of hazards in transit. The following principles need to be considered:
  - (1) Some hazards decay and reduce by weathering so route restrictions may be temporary.
  - (2) When it is not possible to avoid a hazard area, movement needs to follow roads, tracks, hard ground or the shortest vegetation thus reducing pick-up.
  - (3) If uncontaminated assets move into or through a hazard area they can pick up hazard contamination. Liquid CW agents in particular are readily absorbed into many surfaces and track into cracks and crevices by channelling or capillary action.
- d. **Relocation.** Forces in an NBC or TIM hazard area need, where possible, to move away from the hazard. The decision to relocate such forces depends on a number of factors:
  - (1) The current operational situation, the nature of the force's mission and their ability to complete it in place and in their NBC protective posture.
  - (2) The nature of the hazard and whether the movement of the force will spread contamination from the hazard to a clean area. The risk to other forces in the clean area also needs to be considered.

0243. **Control of Spread.** The spread of hazards is controlled by:

- a. **Limitation of Spread.** Limitation of spread involves the close control of movement around, into, within and from a hazard area after an NBC event. Movement plans need to balance operational priorities and NBC penalties with advice from operational and NBC staffs. All movement will need to be controlled by the use of monitoring and control points, and strict track and route discipline because:
  - (1) If contaminated resources are moved into a clean area they may spread hazards by contact. There may also be secondary hazards from dislodged particles and from airborne hazards that will affect personnel passed on route and those at the destination.
  - (2) Those who handle supplies or service or maintain equipment or platforms that have become contaminated will need to wear IPE with a consequent degradation of efficiency.
  - (3) Precautions need to be taken if there is a need to destroy or disable NBC munitions so that the risk of any release NBC or toxic hazards is minimised. Explosive Ordnance Disposal (EOD) specialists will require advice on NBC defence factors.
- b. **Hazard Containment.** Every effort is needed to physically contain NBC and TIM hazards so that they do not spread to uncontaminated areas and pose a risk to unprepared forces. Physical containment may also be necessary to control the spread of NBC and TIM hazards from leaking munitions, improvised devices or industrial facilities. Possible measures include barriers, holding tanks, shielding, encapsulation and burial. Measures may be permanent, temporary or expedient. Radiation sources may have to be buried or physically shielded to reduce the hazard. Aircraft landing sites once contaminated, particularly those for helicopters, need to be covered with earth or decontaminated to prevent re-suspension of the hazard.
- c. **Restriction of Movement for Disease Control.** When biological hazards are encountered, early and continued restriction of movement measures needs to be considered to prevent cross-infection.
- d. **Waste Management.** Contaminated or infectious materials, including runoff from decontamination, will need to be contained and marked in accordance with STANAG 2002 to await subsequent disposal.

0244. **Exposure Management.** The management of exposure to hazards needs to be exercised by:

- a. **Exposure Control.** The exposure of personnel to NBC weapon and ROTA hazards needs to be avoided. Where avoidance is impossible because of other operational priorities, exposure is to be As Low As Reasonably Achievable (ALARA) as given in Section VI to Chapter 1.

- b. **Management of NBC Exposure Data.** An accurate record of NBC information needs to be maintained for NBC attacks, ROTA events, friendly force nuclear strikes, counter-force operations and any exposure of personnel to NBC and/or TIM hazards. This is to assist operational planning, to avoid friendly forces inadvertently encountering a hazard area and for post-conflict remediation.
- c. **Rotation of Assets.** The rotation of force assets through an NBC or TIM hazard area needs to be considered and planned. This is so that the degradation caused by high levels of NBC protection is minimised and exposure to NBC hazards will be, as far as possible, even and thus ALARA throughout the force. There is a particular need to rotate personnel through radioactive hazard areas because exposure (which can be monitored) will accumulate with time.

0245. **Decontamination.** If hazard precaution and control measures are not effective, decontamination may be necessary. Decontamination is defined as the process of making any person, object, or area safe by absorbing, destroying, neutralizing, making harmless, or removing chemical or biological agents, or by removing radioactive material clinging to or around it.<sup>13</sup> Decontamination may be passive or active, reflecting the urgency of the operational situation:

- a. **Passive Decontamination.** Passive decontamination is defined as decontamination effected by natural processes of decay, without benefit of human or mechanical intervention. Sometimes also called 'Natural Decontamination' or 'Weathering'.<sup>14</sup> Radioactive materials decay at a fixed rate dependent upon the material. For biological or chemical contamination, the rate of hazard reduction is greater when the contaminant is exposed to sunlight, higher temperatures, rain and winds. Although weathering is a time consuming process, it carries no manpower or logistic costs. Assets left for passive decontamination need to be isolated and marked as a hazard.
- b. **Active Decontamination.** Active decontamination is defined as the employment of chemical and/or mechanical processes to effect the removal and/or neutralization of chemical, biological or radioactive materials.<sup>14</sup> Active decontamination is conducted when contamination will adversely affect the operational capabilities of the Joint Force. Decontamination is a progressive operation which, to be effective, needs to start as soon as possible.

0246. **Types of Decontamination:**

- a. **Immediate Decontamination.** Decontamination carried out by individuals upon becoming contaminated, to save life and minimize casualties. This may include decontamination of some personal clothing and/or equipment.<sup>14</sup>

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<sup>13</sup> AAP-6.

<sup>14</sup> AAP-21.

- b. **Operational Decontamination.** Decontamination carried out by an individual and/or a unit, restricted to specific parts of operationally essential equipment, materiel and/or working areas, in order to minimize contact and transfer hazards and to sustain operations. This may include decontamination of the individual beyond the scope of immediate decontamination, as well as decontamination of mission-essential spares and limited terrain decontamination.<sup>15</sup>
- c. **Thorough Decontamination.** Decontamination carried out by a unit, with or without external support, to reduce contamination on personnel, equipment, materiel and/or working areas, to permit the partial or total removal of individual protective equipment and to maintain operations with minimum degradation. This may include terrain decontamination beyond the scope of operational decontamination.<sup>15</sup>
- d. **Clearance Decontamination.** Decontamination of equipment and/or personnel on temporary or permanent removal from an operation to a standard sufficient to allow unrestricted transportation, maintenance, employment and disposal.<sup>15</sup>

0247. **Principles of Decontamination.** The following principles of decontamination need to be recognised:

- a. **As Soon as Possible.** The sooner decontamination takes place the less contamination is absorbed into material surfaces and the more effective the process will be, so reducing the time and effort needed. This will increase opportunities for reducing personal protection levels and restoring full combat capability.
- b. **Only What is Necessary.** Decontamination procedures place heavy demands on scarce resources and time. Thus, only those items critical to the pursuit of the mission should be decontaminated.
- c. **As Close to the Contamination as Possible.** Decontamination needs to be conducted as close to the contaminated area as tactically feasible, both to minimise the spread of contamination and to avoid the relocation of mission critical assets.
- d. **Priority.** Priority for decontamination of military resources needs to be considered and laid down by the commander so that the achievement of operational objectives is optimised.

### Fixed Installations

0248. The type of operations carried out at fixed installations such as air bases and port facilities may limit some wider avoidance measures such as dispersion and concealment. If reconnaissance indicates that clean areas exist within the installation and internal relocation is possible, the commander will need to assess the benefits and penalties. The factors that need

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<sup>15</sup> AAP-21.



to be considered are the risks to personnel, degradation in speed of working in complete IPE and the requirement for lengthy decontamination procedures prior to relocating to the clean area. When possible, clean vehicles, vessels and aircraft, not on the ground, need to be relocated and operate from clean areas to prevent the spread of contamination. If an airbase is grossly contaminated, the commander may need to consider diverting aircraft elsewhere or activating dispersed clean operating sites.

## Section VII - NBC Medical Countermeasures and Support

0249. **Introduction.** There are 4 main components for medical countermeasures and support in an NBC environment.
0250. **Medical Pre-Treatments.** Commanders and staffs need to make decisions, on advice from the medical staff about the timely and appropriate administration of prophylactic or preventive compounds (immunisation, medication) as well as other pre-treatment measures (skin barrier sprays or repellents). These need to be issued to personnel under national guidelines.
0251. **Medical Countermeasures.** The use of countermeasures to mitigate the effects of NBC hazards which include:
- a. The scrupulous application of field hygiene measures during operations.
  - b. Specific prophylaxis against assessed threat agents in advance of possible attack.
  - c. Post-exposure vaccination, with or without the simultaneous use of antibiotics.
  - d. Restriction of movement and surveillance of possible direct and indirect victims of transmissible agents, to include disinfecting of exposed body surfaces.
0252. **Casualty Treatment under NBC Conditions.** The treatment of casualties (including conventional casualties) needs to continue under NBC conditions. This can be achieved through the siting of medical facilities inside cover to provide a degree of ballistic protection and to avoid direct contamination by NBC weapons. COLPRO can be added to avoid chemical vapour hazards and reduce the risk of secondary contamination during entry and exit. The use of cover is also necessary for uncontaminated medical supplies, food and fluids. In hazard areas NBC casualty bags with air blowers can be used to place casualties inside an uncontaminated environment.
0253. **Evacuation.** NBC casualties require specialist medical support during evacuation. Additionally conventional casualties require appropriate protection when being evacuated through an NBC environment. Thorough decontamination is required for all contaminated casualties. Guidance on casualty treatment is given in STANAGs 2500 (AmedP-6), 2873 (AmedP-7) and 2879.

## **Section VIII - NBC Equipment Capability**

0254. Specific NBC Defence equipment is needed for detection, identification and monitoring, warning and reporting, physical protection, hazard management and medical countermeasures and support. The degradation caused by NBC and TIM hazards on all other in-service equipment needs to be minimised. The limitations imposed on personnel dressed in full IPE need to be fully considered in the design and development of the man-machine interface for all equipment used in the battle space. STANAG 2352 provides the NATO agreed recommended list of minimum equipment. A guide to the minimum equipment capability is given below.
0255. IPE Comprising:
- a. Detection and dosimetry equipment.
  - b. Respirator and clothing.
  - c. First-aid self-treatment.
  - d. Personal decontamination equipment.
0256. **Unit NBC Defence Equipment.** To:
- a. Detect, alert, warn and report the presence of NBC hazards and TIH.
  - b. Provide COLPRO.
  - c. Treat casualties in an NBC environment in accordance with STANAG 2126 and STANAG 2871.
  - d. Perform immediate and operational decontamination, as appropriate, to continue and complete the mission.
0257. **Specialist NBC Defence Equipment Capability.** To:
- a. Detect, alert, warn and report the presence of NBC hazards and TIH.
  - b. Identify and confirm NBC hazards.
  - c. Sample and transport NBC agents and TIH.
  - d. Carry out thorough and clearance decontamination.
0258. **Simulation and Training Equipment.** Preparation for NBC Defence includes the use of NBC simulation and training equipment to permit regular training in order to evaluate and sustain a satisfactory state of preparedness against NBC attacks and TIH. Training equipment should represent the operational equipment as far as is practicable.

## Section IX - NBC Defence Training and Evaluation

### NBC Defence Training

0259. NBC Defence training should not be conducted in isolation and needs to be integrated into all operational training at all levels. Commanders, staffs and force components need to practise NBC Defence measures, procedures and SOPs whilst on exercise. Furthermore, commanders and staffs need to take into account the effects of the NBC hazards and TIH when training for operations.
0260. STANAG 2150 sets out the minimum NBC Defence training standards of proficiency which nations need to achieve to prepare their forces for NATO operations.
0261. **Multinational NBC Defence Training.** NBC incidents and events need to be included at all levels of command in order to integrate NBC Defence into multinational training. Multinational formations and the NATO integrated military command structure need to be included. The appropriate training and exercises will be essential to integrate non-NATO forces into the NBC defence capability of the Joint Force.

### Evaluation of NBC Defence Capability

0262. The NBC Defence planning and organisation of the elements of a Joint Force are a national responsibility but the resulting capability needs to achieve the aim of the NBC Defence of the Joint Force. Details of organisation, allocation of responsibilities and NBC procedures are clearly defined in the Allied Command Europe (ACE) Forces Standards, Supreme Allied Command Europe (SACEUR) General Defence Plan, STANAG or/and joint publications and ACE directives.
0263. The evaluation of a Joint Force's NBC Defence capability must be assessed in the light of the objective (paragraph 006); to help to deter the use of NBC weapons and to protect forces from NBC events so that they are able to accomplish the mission and maintain freedom of action. The aim of this evaluation is to control and assess the level of achievement of force components to perform at the standard of proficiency laid down by STANAG 2150. Details of such an evaluation for each type of force components or unit are listed in STANAG 2353.

## Section X - Communication and Information Systems Principles for Operations in an NBC Environment

0264. CIS, which bear, handle and distribute information, provide the commander with the ability to manage the available information.<sup>16</sup> The occurrence of an NBC event has the potential for generating a large amount of information. Data can be generated from NBC sensors and observers, and from the general intelligence, surveillance target acquisition and

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<sup>16</sup> AJP-3.

reconnaissance (ISTAR) capability of the Joint Force. Additional data will be generated when this NBC data is collected, integrated and analysed by the Joint Force NBC Warning and Reporting (W&R) capability. Where technically feasible, NBC CIS needs to be integrated within the overall NATO operational automated information systems. This will ensure the rapid passage of information and reduce the need for duplicate CIS capability.

0265. **Simulation.** The Joint Force CIS capability can be used to insert NBC event data at operational NBC Defence sensors and the W&R chain to simulate NBC scenarios. This can provide a simple but realistic opportunity to train and exercise the Joint Force at all levels.

## **Section XI - Logistic Principles for Operations in an NBC Environment.**

0266. **Foresight.** High consumption rates of decontaminants, consumables, water, protective equipment, vaccines and/or other medical countermeasures are a feature of NBC defence operations. There is a need to achieve the appropriate balance between providing adequate stocks of NBC defence equipment without compromising the logistic requirements of the overall mission of the Joint Force.
0267. **Economy.** The future demand for NBC defence equipment and logistic support may be difficult to assess, particularly if there is a need to provide this to non-NATO allies and other organisations. As a result, resources must be used effectively, efficiently and economically, making best use of any additional or local Host Nation support that is available.
0268. **Co-operation.** The NBC defence requirements of the Joint Force need to be reconciled with its overall logistic needs and close co-operation is necessary at all levels. Although force components need to anticipate their own integral logistic support, some mutual support may be necessary particularly where there may be disparities in NBC defence capability. The demand for NBC protective equipment and materiel may extend beyond the Joint Forces to other allies, non-military organisations and non-combatants.
0269. **Flexibility.** In an NBC environment the logistic system needs to be versatile and able to react rapidly to unforeseen circumstances. The hazards and potential damage caused by NBC or TIM hazards may necessitate the relocation of support bases, redirection of supply flow, re-allocation of transport and/or short-notice transfer of assets. Work schedules may need to be altered if NBC conditions degrade logistic operations. Plans are needed for the prompt supply NBC related equipment to regions where the use of NBC weapons or deliberate TIM releases is anticipated.

## CHAPTER 3 - PREPARATIONS FOR NUCLEAR, BIOLOGICAL AND CHEMICAL DEFENCE

*‘There will be a number of complex, and potentially sensitive, NBC policy issues which will involve the JFC and require consultation at the highest levels..... There may be a requirement to extend NBC protection beyond the Joint Force, to include civilians in support of the operation, or neutrals in the JOA. Media attention will also be intense, and the identified or perceived threat of NBC will generate considerable disquiet both in-theatre and at home. Clearly, these factors will have a significant impact upon the JFC’s campaign planning and the manner in which he employs his forces.’<sup>1</sup>*

### Section I - Introduction

0301. This Chapter describes the NBC defence planning and preparation process for an Allied Joint Force. The NBC defence policy issues introduced in AJP-3 (as above), and discussed more fully in Section II below, will influence the NBC factors which the Joint Force Commander (JFC) needs to consider during campaign planning. These factors need to be considered at all planning stages to decide the appropriate NBC defence capability for the Joint Force. NBC defence is a general rather than specialist responsibility so planning the appropriate capability is a command and J3 Operations function. J3 NBC Defence Operational Support is needed within the Joint Staff to provide advice for the JFC and all the staff functions. The following staff processes need to reflect the possibility of NBC use and Toxic Industrial Hazard (TIH) during campaign planning and deployment:

- a. Key NBC defence planning issues.
- b. Intelligence.
- c. The NBC factor in campaign planning.
- d. Operational Environments.
- e. Staff functions and NBC defence.
- f. NBC defence capability.
- g. Deployment.

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<sup>1</sup> AJP-3, Chapter 5 Preserving and Protecting the Force.

## Section II - Key NBC Defence Issues

0302. **Introduction.** There may be a number of complex and sensitive NBC defence issues that arise in planning for the Joint Force. These issues can only be resolved if due note of them is taken at all stages of planning and the appropriate contingency plans made and measures taken.
0303. **Balance of Operational and NBC Priorities.** The JFC will need to provide guidance to subordinate commanders on the balance between operational priorities and avoidance of NBC hazards, within (if necessary and appropriate) his 'Statement of Intent' and as guidance in the campaign plan. There will also be a need to co-ordinate the application of policy for minimising the exposure of personnel to NBC and Toxic Industrial Materials (TIM) hazards between different national components, the Host Nation and other in-theatre agencies. For example, nations interpret differently the application of International Commission on Radiological Protection, (ICRP) recommendations for the management of the exposure of personnel to radioactive hazards.
0304. **Force Component NBC Defence Capability.** The level, availability and quality of NBC defence capability within the Joint Force may vary, particularly if non-NATO nations are contributing to the operation. Such variations will influence the employment of different components if NBC and TIM hazards are encountered.
0305. **Extension of NBC Protection.** There may be a need to extend NBC protection beyond the Joint Force to include civilians in support of the operation, other agencies in-theatre and the Host Nation (HN). (Such extension is also likely to apply to Air Defence and Medical Support.) A Multinational Joint Logistic Centre (MJLC)<sup>2</sup> in support of J4 Logistics needs to be considered to co-ordinate support between components, National Support Elements (NSEs), the HN and non-governmental organisations (NGOs). Resource implications for the Joint Force will need to be resolved at the Strategic Level.
0306. **NBC Specialists.** The consequences of the use of NBC weapons by an adversary and Release Other Than Attack (ROTA) are diverse and potentially wide-ranging. A balance needs to be struck between the combat capability of the Joint Force and its NBC defence capability. In a significant NBC or TIM hazard situation, the specialist capability needed to deal with the specific hazard is likely to be in short supply. The assignment of such scarce specialist resources will require close co-ordination and planning. The J3 NBC Staff will need to maintain contingency lists of specialist-area capability amongst national components (military or civilian) for advice and possible direct support.
0307. **Biological Warfare Hazard Monitoring.** If there is a significant Biological Warfare (BW) threat, there will be a need to monitor biological events across the Joint Operations Area (JOA). There will be a need for close co-ordination between all elements of the Joint Force

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<sup>2</sup> Further details are provided in AJP-4.

and the Host Nation with scientific advice from in-theatre and nations through the J3 NBC Staff. The outputs of this monitoring process will be:

- a. Assessment of the probability that a BW attack might occur/has occurred (in particular, first use), through continuous threat/event assessment.
- b. Assessment of the impact of the BW threat or event on future operations and ensure this is reflected in plans.

0308. **Biological Warfare Detector Priorities.** The BW hazard released from the use of biological weapons or the release of TIB can spread widely, particularly as aerosols downwind. There is a need therefore to prioritise the employment of BW detectors. The distribution of detectors needs to be planned at a Joint Force level to cover likely BW hazard dissemination paths into and across the Joint Operations Area (JOA). Co-ordination will also be needed with the Strategic Command to cover adjacent areas and the Lines of Communication (LoC).
0309. **Burial of Contaminated Human Remains.** The possibility of mass fatalities and contaminated human remains will complicate burial procedures in an NBC environment. Decisions about in-theatre burial sites and/or repatriation of the dead will be emotive and will probably need to be made at the Strategic Level.
0310. **Medical Pre-Treatment.** Decisions need to be made, on advice from the medical staff, about the timely and appropriate administration of prophylactic or preventive medical pre-treatment measures to counter some of the effects of NBC hazards. However, these need to be issued to personnel under national guidelines because these will vary between the different Joint Force components.
0311. **Common Threats and Challenges.** There needs to be a common understanding of the NBC threat and the characterisation of specific NBC and TIM challenges throughout the Joint Force. Nations have their own perception of the NBC threat and their own interpretation to their NBC defence capability. Therefore, the maximum use needs to be made of NATO standardisation agreements (STANAGs) and publications<sup>3</sup> (AJP, ATP, AEPs, AMedPs, AAPs) as a common baseline throughout the various components of the Joint Force. AJP-3.8 provides a key focus to a common approach.

### Section III - Intelligence

0312. **Intelligence Preparation of the Battlespace.** A current, comprehensive and accurate intelligence assessment of the NBC threat (including TIH risks) in the JOA is needed. This is achieved through the Intelligence Preparation of the Battlespace (IPB) process. The NBC IPB process is the staff tool that helps identify and answer the commander's Priority

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<sup>3</sup> Relevant STANAGs, Allied Joint Publications, Tactical Publications Engineering Publications and Medical Publications are listed (with their covering STANAGs) in the References Section to this publication.

Intelligence Requirements (PIRs) and is the first step in the JFC's Operational Planning Process (OPP). IPB is a cyclical process that occurs before and concurrently with mission analysis and the other steps of the JFC OPP. Within this, an NBC event template is produced that becomes the basis of further intelligence and operations planning. It includes the evaluation of the threat and the area of operations, the readiness of friendly forces, terrain analysis and meteorological evaluation. **Annex A** provides a guide to the conduct of the NBC IPB.

0313. **Threat Assessment.** The JFC needs to initiate an NBC threat and ROTA assessment which must be kept under constant review. This is so that the capabilities needed to counter possible NBC risks; threats and TIM hazards are prepared before the generation of a Joint Force. The Force will then be well placed to meet and deal such possible hazards whilst avoiding unnecessary degradation of operational performance. Operations in areas with toxic industrial risks obviously need, where at all possible, to be avoided, except in the face of overriding operational imperatives; this will be of especial importance in Crisis Response Operations (CRO). The means of describing the prevailing NBC threat levels and associated precautionary postures and dissemination throughout the Joint Force are set out in STANAG 2984.

## Section IV - The NBC Factor in Campaign Planning<sup>4</sup>

### Preparation of the Estimate

0314. **End-state.** If there is any risk that the Joint Force may encounter NBC or TIM hazards in-theatre, the NBC factor must be included in campaign planning. The campaign needs to be terminated or the conflict needs to be resolved on favourable terms. NBC events and the release of NBC and/or TIM hazards are likely to significantly reduce the chance of a favourable outcome. The end state, and thus the focus for campaign planning, needs to include consideration of NBC defence issues so that the widest possible conventional and NBC defence measures are considered at the strategic, operational and tactical level to deter, neutralise or mitigate any possible adversary NBC threat.
0315. **Centre of Gravity and Decisive Points.** The identification of Centres of Gravity (CoGs) and decisive points, both friendly and adversary, are essential to the estimate process. The NBC factor needs to be considered by the JFC in his assessment of an adversary's CoG and his own in terms of:
- a. The consequences of possible damage to an adversary's NBC weapon infrastructure or TIM facilities during an attack on his CoG and Decisive Points.
  - b. The possibility of a successful attack on the adversary's CoG by the Joint Force triggering an NBC weapon response.

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<sup>4</sup> The process of campaign planning is fully described in Chapter 3 to AJP 3.



- c. The vulnerability of the Joint Force's own CoGs and decisive points to NBC weapon attack and/or TIM release by an adversary and the NBC defence posture that is needed for the appropriate protection.
0316. **Lines of Operation.** The potential impact of NBC events need to be included so that operational tempo is not lost and lines of operation, which link decisive points in time and space, are not dislocated by NBC or TIM hazards.
0317. **Main Effort.** The concept of main effort provides a focus for the activity that the JFC considers crucial to success. The possible impact of NBC events needs to be considered and the appropriate NBC defence posture for the main effort (or subordinate main efforts) prepared. This is so that NBC events, particularly the first occurrence, do not generate uncertainty as the operational situation changes and subordinate commanders can take quick and independent action.
0318. **Sequencing, Phasing and Pauses.** The NBC aspect may be significant in sequencing and phasing if the NBC defence capability of the Joint Force is inadequate to cover all lines of operation or becomes depleted. During an operational pause the NBC defence capability and thus protection of the Joint Force components needs to be considered in case an adversary has an opportunity to take the initiative, albeit limited, and use NBC weapons or TIH
0319. **The Estimate Process.** The estimate process is central to campaign planning. All relevant NBC defence issues need to be included in the JFC's NBC Defence Estimate which supports the main planning estimate. A guide to an NBC Defence Estimate is at **Annex B**. The estimate allow the JFC to select his course of action and issue planning guidance. This enables his subordinate commanders and their staffs to complete their own estimates and plans. These also need to include an NBC Defence Annex.

### **Production of the Campaign Plan**

0320. The campaign plan will include the main effort and lines of operation already identified in the estimate. The concept of operations and the commander's intent need to be added.
0321. **Concept of Operations.** The concept of operations explains how the JFC intends to attain his objectives in a possible NBC or TIM risk environment, while informing both his superiors and subordinates of his intentions. The commander's intent and his main effort are means by which this can be communicated.
0322. **Commander's Intent.** The JFC's statement of intent defines the end-state in relation to the factors of mission, adversary, operating environment (which must include possible NBC and ROTA risks), terrain, forces, time and preparation for future operations. For every mission, the JFC determines what needs to be achieved and begins to develop plans for the Joint Force to accomplish the mission in a possible NBC environment. If the NBC and ROTA risk is significant, guidance on the balance between operational priorities and the risk of exposure of personnel to NBC and TIM hazards will be needed.

0323. **Operation Order.** Completion of the campaign plan allows the operation order to be drafted which lays down the details of the forthcoming operation. The 5 main headings for the Operation Order are: SITUATION; MISSION; EXECUTION; SERVICE SUPPORT; COMMAND AND SIGNAL. An example of the NBC Defence Annex for a possible operations order is at **Annex C**.

### Standard Operating Procedures

0324. Standard Operating Procedures (SOPs) provide a valuable guide to the acceptable and agreed approach in particular circumstances, if no other instructions are given. They are not, however, a mandatory statement on how to act. Commanders always have the flexibility, indeed the responsibility, to take the necessary action to meet each different circumstance. Ideally, general SOPs should need no modification for operations in an NBC environment. However, this will seldom be the case and each general SOP may need a section stating how the procedure should be modified in an NBC environment. NBC SOPs need to contain additional specialised NBC information to address specific NBC issues. However, the exact balance and distribution of NBC information between general and NBC SOPs need to be decided within the components of the Joint Force depending on their differing circumstances and needs.
0325. A guide to the subjects that may need to be included in the different pre-event, during-event and post-event NBC SOPs is provided at **Annex D**. SOPs need to be considered, prepared and rationalised at, and between, each operational and tactical level of the Joint Force before deployment. General and NBC operating procedures need to be validated, practised and possibly amended in a simulated NBC environment during training, exercises and evaluations.

## Section V - Operational Environments

0326. **Introduction.** The JFC and the Joint Force staff need to make an assessment of how NBC hazards and TIH may influence operations in the land, maritime, air and rear area operational environments, as part of the NBC IPB. Rear areas and LoC are also included. The factors which need to be considered for each environment are set out below.
0327. **Operations in the Land Environment.** Land operations include manoeuvre, fire support, communications, aviation, mobility, and logistics. The special nature of land operations with its emphasis on manoeuvre to enhance tempo, causes the various characteristics and effects of NBC weapons to have different operational impacts to those arising in the other two operating environments. Land component elements face especially severe challenges in terms of their potential accessibility to the full range of NBC delivery means across the totality of the JOA and their need to maintain freedom of movement, notwithstanding the presence of persistent contaminants. Furthermore, the extreme physical demands placed on ground combat forces makes them especially vulnerable to the degrading effects of the sustained use of IPE whilst the employment of some Collective Protection (COLPRO) solutions may not always be realistic. By contrast, the special vulnerabilities of the Land

Component may be mitigated to a considerable degree by the application of principles that build upon wider operational doctrine. These include the employment of firepower in the context of Deep Operations to destroy all but the longest-range NBC delivery means before use or to prevent the forward loading of warheads. There will also be significant opportunities for vulnerability reduction by means of dispersion, concealment, maintenance of tempo and the application of the principle of surprise. Taken together, these will deny or diminish an adversary's ability to find targets, assemble appropriate delivery systems and deliver effective NBC strikes.

0328. **Operations in the Maritime Environment.** Maritime operations include surface, subsurface, air, strategic air operations, amphibious, sealift and mine warfare. Sea platforms may be able to transit NBC hazards by the use of the COLPRO provided by the citadel and the use of the pre-wet system. Upper deck crews can enter and exit the COLPRO through airlocks and cleansing stations. However, sea platforms may be more vulnerable to NBC attack or TIH when in harbour or operating in the littoral. The power and resolution of on board sensors and ships' Command and Control (C2) facilities will contribute significantly to an accurate assessment of the NBC situation in the battlespace.
0329. **Operations in the Air Environment.** Air Operations include counter air operations, anti surface force air operations, strategic air operations, and supporting air operations. Air operations may need to be conducted within the hazard area because it may not be practical to transfer operations to another base outside the affected area in response to a short-term hazard. On-base NBC hazards will directly affect and may significantly reduce readiness and aircraft turn-round times. When operating under NBC conditions, the launch rate for air missions will be significantly reduced. Aircrew are particularly vulnerable to performance degradation when operating in NBC conditions and special measures need to be taken for their protection. Aircrew NBC equipment and procedures require a high standards of user training and crews are subject to physiological degradation in these conditions.
0330. **Operations in the Rear Area and Lines of Communication.**<sup>5</sup> The Points of Disembarkation (PODs) [(seaport (SPOD), airport (APOD), or railhead (RPOD))] through which forces and supplies deploy into the JOA are normally selected by the nations contributing components to the Joint Force. The Forward Mounting Base (FMB) from which an operation may be launched into the JOA is selected by the Strategic Commander, with advice from the JFC, as part of his concept of operations for the deployment, sustainment and recovery of the Joint Force. The Forward Operating Base (FOB), a locality within the JOA from which subsequent operations are projected, is selected by the JFC and his component commanders. Such nodes and their links with the Joint Force through LoC need to be secure and not directly exposed to hostile action. However, such key points may provide an attractive target for an adversary with an NBC capability. This is because they are likely to be fixed, cover a wide area and be well defined. In addition, they are likely to contain a significant proportion of Joint Force resources in transit and storage which, if unprotected

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<sup>5</sup> In accordance with AJP-3, Section III to Chapter 4

and uncontrolled, may quickly become contaminated and spread and transmit NBC hazards. The protection of the POD and FMB from NBC events is ultimately the responsibility of the Strategic Commander. Close co-ordination will be needed with the contributing nations and the JFC. The protection of the FOB and the LoC is the responsibility of the JFC and needs to be a critical factor in operational planning and the NBC defence plan.

## **Section VI – Joint Staff Planning Functions and NBC Defence**

### **Introduction**

0331. The circumstances surrounding the establishment of a Joint Force, its mission and the environment in which the mission is to be conducted will dictate the staff requirements and functions. Once again, if there is any risk that the Joint Force may encounter NBC or TIM hazards on deployment, or in-theatre, an operational support NBC defence function must be included. The JFC will organise his staff to optimise its ability to plan, conduct and support possible operation under NBC conditions successfully. There is a need for support from different components of the Joint Force to help sustain NBC defence in the face of NBC threats and hazards. This will be co-ordinated and arranged through the Joint Staff. The particular aspect of NBC defence that the different Joint Staff areas need to consider or that they need to provide during planning and later during operations are included for each of the staff functions set out below. Much of the detail is given in **Annex E**. Those staff functions which have a particular relevance in an NBC environment are included within the Chapter.

### **J1 Personnel and Administration**

0332. J1 Personnel and Administration provide advice on the personnel policies and manpower management procedures established by national authorities for their force components. The J1 Staff are responsible for a wide range of activities. These activities and their NBC defence implications are listed below, further detail is given in **Annex E**:

- a. Maintenance of morale and discipline.
- b. Postal services, screening for NBC hazards.
- c. Safety, minimising the exposure of personnel to an NBC environment.
- d. Provost support for hazard management measures and Sampling and Identification of Biological, Chemical and Radiological Agents (SIBCRA).
- e. Prisoners of War (PW) administration and NBC protection.
- f. Casualty reporting and the maintenance of records of exposure to NBC and TIM hazards.

**J2 Intelligence**

0333. J2 Intelligence is responsible for the provision of accurate timely and relevant intelligence on the possible NBC threat and events, if they occur, to meet the JFC's operational and security needs. The primary means for achieving this is the IPB covered in Section II above. Examples of the sort of information that the Intelligence Staff needs to consider about the NBC potential of possible adversaries is also included in **Annex A**.

**J3 Operations**

0334. J3 Operations act as the focal point through which the JFC directs the conduct of a joint operation, ensuring unity of effort and the most effective use of resources supporting immediate and planned operations. NBC defence operational support must be included if there is a risk of NBC or TIM hazards during deployment or in-theatre. J3 Operations is responsible for a wide range of activities. These activities and their NBC defence implications are listed below, further detail is given in **Annex E**:

- a. Orders, production and issue.
- b. Joint Force HQ, deployment, location and protection.
- c. Force organisation and tasks, in particular NBC defence capability.
- d. Rules of engagement (ROE) to counter a possible adversary NBC threat.
- e. Plans and Operations, in particular the NBC implications of special operations, aviation and meteorology.
- f. Information operations to deter adversary NBC attacks.
- g. Targeting of possible adversary NBC capability.
- h. Force protection and NBC capability.
- i. Security, against possible asymmetric NBC attack.
- j. Refugees, possible support and control.

**J3 NBC Defence**

0335. Assess the NBC defence status and capabilities of assigned forces, as a pre-condition for the JFC's decisions on a course of action and his concept of operations. Co-ordinate the conduct of NBC defence within the JOA and advise the JFC on the impact of NBC and ROTA events. Produce the NBC Annex for Estimates and Orders for J3 Operations. Provide NBC defence advice to other staff functions.

0336. Set up and maintain, with J6 CIS a Warning and Reporting capability for the timely Reporting of NBC and ROTA events and warning of their consequences within the Joint Force, to other forces and the Regional and Strategic Commands. Make arrangements with J6 CIS and J9 Civil-military Co-operation (CIMIC) for the integration, if feasible, of the Joint Force CIS and Warning and Reporting (W&R) capability with the HN emergency services.
0337. Develop plans for:
- a. Movement control in an NBC or TIM hazard environment to avoid and thus limit the spread of contamination and minimise the exposure of personnel.
  - b. Force restriction of movement measures, in consultation with the J4 Medical Branch, to control the spread of both transmissible BW agents and naturally occurring disease.
0338. Set up an NBC defence cell to provide a focus for specialist and technical advice on NBC weapon effects, TIM and NBC defence measures:
- a. Use the links provided by CIS for the timely provision, if required, of detailed specialist NBC analysis and advice from home based or host nation technical experts and related environmental, environmental health, hygiene and medical experts.
  - b. Use IT equipment for the modelling of potential hazard areas and environmental information to assist the NBC staff to assess NBC risks.

#### **J4 Logistics**

0339. J4 Logistics (including the medical branch) is responsible for assessing the logistic and medical/health service support required to achieve the JFC's campaign objectives, if necessary in an NBC or TIH environment, throughout the campaign. A MJLC (paragraph 305) may need to be activated to co-ordinate support and resolve logistic NBC defence issues between force components, National Support Elements (NSEs), the HN and non-governmental organisations (NGOs), particularly during CRO.
0340. NBC defence operations can place great demands on NATO logistic effort. This is complicated further by the need to sustain NBC defence while also supporting the wider operation. Furthermore, although national force components are expected to deploy with their own integral logistic support, some mutual support may be necessary, particularly where there are disparities in NBC defence capability. The demand for NBC protective equipment and materiel may extend beyond NATO Forces to Multinational Forces, non-military organisations and non-combatants. Further detail is set out at **Annex E** on logistic planning factors the Explosive Ordnance Disposal (EOD) of NBC munitions. Key logistic issues are:
- a. The protection of supplies and logistic assets from the hazards and contamination which may result from NBC events.

- b. The movement of supplies along Main Supply Routes (MSRs) to supply points and fixed logistic sites whilst also avoiding NBC hazards. This may require the selection of alternative routes and sites.
  - c. The control and movement of personnel, equipment and supplies through NBC hazard areas.
  - d. The re-supply of replacement NBC protective equipment, decontaminants, and medical supplies.
  - e. The requirements, priorities and procedures for the decontamination of contaminated assets, in consultation with J3 Operations for priorities.
  - f. The need for support from local in-theatre resources, in consultation with J4 Logistics and the MJLC, J5 Policy, J8 Finance and J9 CIMIC.
0341. **Contaminated Human Remains.** The handling of contaminated human remains is a logistic function and there will be a requirement for in-theatre emergency burial procedures in accordance with STANAG 2070. Where the capabilities exist, human remains will need to be decontaminated and handled in a conventional manner. However, if they cannot be decontaminated, they will need to be buried at the site of recovery and the site clearly marked.

#### J4 Medical

0342. An integrated force medical response is needed for effective defence against the use of NBC weapons and agents. Additional detail is given in **Annex G**. Medical countermeasures, both pre and post exposure, in the form of vaccination, prophylaxis and treatment of weapon and agent effects are crucial in mitigating possible operational impacts. Treatment and management procedures need to be implemented for patients with highly infectious or contagious diseases. Traditional medical responses to infectious disease need to include post-exposure, pre-symptomatic diagnosis, mass treatment protocols, mass casualty and psychiatric care, medical evacuation, restriction of movement, disposal of contagious and infectious remains and the integration of HN medical capabilities. Accurate and complete individual medical records need to be generated and maintained to assist in the long-term medical screening of all personnel.
0343. Medical environmental health specialists need to provide, in cooperation with HAZMAT specialists, guidance to J3 NBC on the effects of exposure to TIM and the treatments necessary should personnel become casualties as a result.

## J5 Plans and Policy

0344. J5 Plans and Policy develop Joint Force policies and plans for use in an NBC environment. These are given in **Annex E**, in outline they are:

- a. The achievement of the Joint Force mission with the appropriate NBC defence capability.
- b. Information operations policy to deter possible adversary use of NBC weapons.
- c. The assessment of the impact of NBC weapons and TIM, including emergency planning for local populations.

## J6 Communications and Information Systems

0345. CIS link the Joint Force together and provide the necessary information for commanders' estimates at all operational and tactical levels. However, most CIS equipment is likely to be unhardened and needs to be protected against the electromagnetic pulse from nuclear weapons effects and from surface NBC contamination.

0346. J3 NBC will need to advise the JFC, and J6 CIS, at the outset on who needs which level and what quantity of NBC information so that it is published within the JFC's CIS plan. The crucial issue to be addressed by the NBC information plan and understood throughout the Joint Force is: 'who needs what NBC information, when and how', rather than 'what information can be acquired'. The NBC information management plan will need to be closely co-ordinated with other plans. The following needs to be addressed:

- a. The use of common data protocols so that the NBC defence capability of the Joint Force is linked and integrated within all Force components at all operational and tactical levels. NBC information needs to be shared between the different Force component NBC defence CIS and within the wider general and specialist function Joint Force CIS.
- b. The protocols for the rapid passing of accurate information from the Joint Force to the superior Strategic HQ on the first use of NBC weapons (or events) by an adversary.
- c. The mechanics of the transfer of NBC information from general Joint Force CIS to any specialist NBC defence and Warning and Reporting CIS capability and the reverse transfer of general Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR) and other specialist function information.

## J7 Training

0347. J7 Training advise on and manage in-theatre NBC defence training during the Joint Force work-up period prior to the possible outbreak of conflict. There is a particular need for



appropriate training and exercises to integrate non-NATO forces into the NBC defence capability of the Joint Force. J7 Training also conduct NBC defence training for augmentation forces added to an ongoing campaign. This is to pass on the NBC defence lessons learnt in-theatre to relief forces to ensure a smooth transition.

### **J8 Resources and Finance**

0348. J8 Resources and Finance need to prepare contingency plans for the prompt release of finance to cover the increase in resources the Joint Force will need to help counter significant NBC and TIM hazards, particularly support to and from the HN and other agencies during CRO.

### **J9 Civil-Military Co-operation**

0349. J9 CIMIC are responsible for advising the JFC on the implications of all NBC defence activities which directly concern relations between the Joint Force and local government, civil population, International Organisations (IOs), NGOs and other agencies in-theatre. Local civilian authorities have prime responsibility for dealing with NBC events within their areas of responsibility. However, if their resources are inadequate they may request assistance. This assistance may be from the Joint Force to HN or vice versa. Request for assistance need to be assessed by J9 CIMIC support and commanders advised accordingly on:
- a. Transport capability to assist in the evacuation of mass casualties.
  - b. Heavy equipment to help provide engineering support and the construction and operation of decontamination sites.
  - c. Medical treatments and facilities to help handle mass casualties.
  - d. Shelter that incorporates COLPRO or infrastructure facilities into which transportable COLPRO can be deployed.
  - e. Supplies of uncontaminated food and clean potable water.
  - f. The disposal of contaminated waste and the expertise to handle hazardous materials.
  - g. Information on in-country TIM sites (such as chemical plants and storage sites, nuclear facilities and bio-research laboratories).

### **Public Information**

0350. The Public Information (PI) staff need to provide advice to the JFC on the PI implications of the occurrence of NBC and TIM hazards in the JOA. This needs to be co-ordinated with the relevant Strategic and Regional Command staffs and representatives from the Joint Force components. Forces responding to an NBC event need to be prepared to handle requests for information from the international media, HN, the public and Joint Force personnel.

Therefore, for PI and media operations, staff need to be provided with accurate and timely information about the NBC event from commanders and staffs at all levels. This need will be particularly important when an NBC event first occurs in-theatre and media interest is likely to be intense. Close liaison with J9 CIMIC is required.

## Section VII - Specialist NBC Defence Capability

0351. While the majority of NBC defence capability as described in Chapter 2 is integral to units, some functions will necessarily have to be performed by specialist troops using dedicated equipment. Examples, amongst others, include biological detection, some reconnaissance and survey assets, SIBCRA, COLPRO and decontamination at the thorough and clearance levels. Levels of proficiency for NBC defence specialists are given in STANAG 2150. Operation guidelines for specialist NBC equipment are given in STANAG 2352.
0352. The specialist NBC defence capability of a Joint Force is provided by individual contributing nations. The nature of these capabilities will depend on prior assessment of the NBC and TIM risk which may be encountered in the JOA. Arrangements for the employment of sometimes-scarce national assets to support the whole Joint Force will need early attention in the planning phase of an operation. The force needs to have the specialist NBC components given below.
0353. **Biological Detection.** Current biological detection solutions need specialist manning and procedures. In the longer term all-arms solutions may emerge.
0354. **Reconnaissance.** NBC reconnaissance needs to be supported by combat and service support surveillance and reconnaissance assets, for example sensors on unmanned aerial vehicles (UAVs) and airborne locating and detection sensors. Battlespace reconnaissance includes:
- a. The observation and reporting of local weather and terrain conditions.
  - b. Monitoring of potential TIH.
  - c. Detection and monitoring of NBC hazards and contaminanats.
0355. **Survey.** On ground critical to the achievement of the commander's intent detailed survey will be needed to confirm the location, characteristics and possible duration of NBC hazards.
0356. **Sampling and Identification of Biological, Chemical and Radiological Agents.** The performance of SIBCRA in accordance with the SIBCA/SIRA Handbooks is described in AEP-10 and 49. The Joint Force needs the capability to collect samples and transport them safely to an accredited laboratory in accordance with internationally accepted evidence-handling standards. Samples need to be taken from the scene of a suspected NBC attack (as indicated by NBC or TIM reconnaissance), from overrun storage sites, from the medical casualty evacuation chain or from unexploded or partially exploded ordnance involved in NBC attack.

0357. **Deployable Field Laboratories.** Deployable Field NBC laboratory facilities can provide a capability for the in-situ and timely analysis and identification of NBC samples, including agent mixtures and various types of ionising radiation.
0358. **Collective Protection.** The provision of COLPRO depends on whether forces need to occupy static high-risk areas and are likely to be subject to an NBC hazard for long periods. Consideration always needs to be given to whether an adversary has the delivery means to hit the target and friendly forces can achieve protection through manoeuvre.
0359. **Thorough NBC Decontamination.** The Joint Force needs the capability to perform thorough decontamination of fixed installations, non-mobile equipment, mobile equipment, supplies and personnel. In some special cases, this may be extended to include limited terrain decontamination, particularly at fixed installations and critical transport nodes.
0360. **Clearance Decontamination.** Clearance decontamination is likely to be beyond the resources and capability of the Joint Force and the support of specialised external organisations and scientific centres may be needed. Clearance decontamination is likely to be expensive in time and resources because there is a need to comply with national and international standards for cross-border movement.

## Section VIII - Other Capabilities

0361. **Support to Other Capabilities.** If national training and the equipment of NBC defence specialists allow, they can provide support for:
- a. **Water Purification, Transportation and Extraction.** Purification of polluted, contaminated or salty raw water into potable water.
  - b. **Hygiene.** Identification and assessment of hazards and disinfecting.
  - c. **Recovery.** Recovery fire fighting, search, rescue of survivors and first aid.
0362. **Support from other Capabilities.** NBC defence assets do not include pools of manpower or plant, support may be needed in the following areas:
- a. The provision of potable water in an NBC environment and the provision of water for decontamination.
  - b. The construction and possible protection of COLPRO shelters and the construction of thorough and clearance decontamination facilities.
  - c. The limited decontamination of terrain by removal of contaminated soil and material to support the operational mission.
  - d. The burial and marking of contaminated material for later recovery.

- e. Certain NBC defence activities particularly decontamination and medical support may require the temporary allocation of manpower for the prompt execution of labour intensive tasks.

## Section IX - Deployment

0363. Deployment of the Joint Force marks the end of the campaign planning and preparation phase for NBC defence. The JFC assumes the operational command and control of the components of the Joint Force which is relinquished by the contributing nations. This change will normally take place once the components arrive in-theatre. However, the hand over may be complicated by high NBC threat levels or other threats to forces during transit and interim arrangements may be needed between contributing nations to maintain protection and security.
0364. Forces can be particularly vulnerable during deployment from direct, covert or terrorist attacks and they need to be capable of reacting to NBC events if and when they occur. The NBC defence Annex to the Joint Force Campaign Plan and Operations Order needs to include the necessary detail to cover possible NBC events during deployment. NBC defence measures including threat levels and dress states need to be promulgated before deployment commences. The following arrangements will need to be put in place within the JOA at the commencement of operations thereby ensuring a robust NBC defence posture in the critical deployment phase. The following capabilities require additional emphasis during deployment:
- a. **Intelligence.** Intelligence gathering, supported by NBC reconnaissance, will need to be deployed in advance of main elements to facilitate the NBC threat assessment.
  - b. **Warning and Reporting.** A robust Warning and Reporting organisation needs to be established to cover the deploying force from national bases to the JOA.
  - c. **Detection.** Early deployment and positioning of detectors is needed to counter the possible covert, terrorist or early use of NBC agents, particularly BW.
  - d. **Protection.** All Joint Force personnel need access to NBC IPE in accordance with the acknowledged threat and dress states.
  - e. **Logistics.** Logistics support needs to be sufficiently flexible to react to significant demands that may result from an NBC event during the deployment phase.

## CHAPTER 4 - THE CONDUCT OF NUCLEAR, BIOLOGICAL, AND CHEMICAL DEFENCE ON OPERATIONS

### Section I - Introduction

0401. The purpose of this Chapter is to guide commanders and staffs in the conduct of NBC defence within an operation. NBC defence cannot be considered in isolation and must be included as an element in the overall mission planning for the Joint Force.
0402. The deployment phase of an operation will bring together the components of the Joint Force within the Joint Operations Area (JOA). Operational command and control will now pass from nations to the Joint Force Commander (JFC). The conduct of NBC defence in subsequent operations is treated as falling into 3 phases:
- a. **Pre-Event.** The completion of in-theatre NBC defence preparations.
  - b. **During-Event.** The implementation of contingent NBC defence measures in response to NBC attacks or Release Other Than Attack (ROTA).
  - c. **Post-Event.** Post-strike or release measures to safeguard personnel, restore operational capabilities and regain tempo.
0403. **Minor NBC Event.** Even if a minor NBC event occurs, for example a limited Toxic Industrial Materials (TIM) release, the steps given in this Chapter need to be followed. This is so that preparatory measures are in place and sustained. In particular, even localised and small-scale events must be reported allowing commanders to make the correct assessment of the risks and their wider implications. NBC events, particularly biological or Toxic Industrial Radiological (TIH), may have unforeseen consequences which may only become apparent after analysis. Here there is a critical need for intelligence, information and assessment.

### Section II - NBC Threat Assessment and Validation

0404. **Assessment.** The NBC threat assessment determines the NBC Threat Level. This level determines the NBC protective posture that the Joint Force needs to adopt. The protective posture needs to be sufficiently flexible in application to allow commanders at all levels to balance the risk of overprotecting forces whilst maintaining operational effectiveness. Commanders need to keep the NBC threat level under constant review from updated threat assessments so that NBC protective measures can be adjusted as necessary throughout each operational phase. The assessment of the risk posed by ROTA needs to be included in all categories of NATO operations.
0405. **Validation.** Intelligence data and other information about the JOA need to be validated in-theatre by the NBC surveillance of areas and sites of interest. This may, ideally, be included

in the JFC's general Joint Force reconnaissance and survey plan and effort on arrival in theatre. Close co-operation between NBC defence and environmental health staffs will be essential. The following needs to be established:

- a. The background radiation baseline of the JOA in general and at specific Joint Force accommodation sites.
- b. The location, extent, security and condition of TIM sites and facilities.
- c. The location and security of any possible Host Nation (HN) armed force's NBC munitions and training aids.
- d. The baseline of indigenous diseases.

### Section III - Pre-Event Preparations

0406. **Introduction.** Specific pre-event preparations are covered below in this Section. However, 'during-event' and 'post-event' phases which follow in subsequent Sections, need to be prepared and practised in advance during this 'pre-event' phase. Opportunities for final rehearsal post-deployment but prior to the commencement of active operations need to be fully exploited. It is important that such rehearsals are used by the J3 Operations and J7 Training Staffs to refine multinational procedures, particularly in Warning and Reporting (W&R). These measures need to be integrated with all other general operational preparations. J3 Operations and NBC, J5 Plans, J9 Civil-Military Co-operation (CIMIC) and Public Information (PI) need to mount and integrated information operations plan to deter any possible use of NBC weapons by an adversary and to reassure local populations.

#### Standard Operating Procedures

0407. The Joint Force NBC defence Standard Operating Procedures (SOPs) need to have been prepared pre-deployment as indicated in Section IV to Chapter 3 and **Annex D**. Once deployed the Joint Force needs to practice, validate and if necessary adjust these SOPs during routine operations, re-supply and during training and exercises to meet the conditions encountered in-theatre. A check must also be made to ensure that general operating procedures are workable in an NBC environment.

#### Training and Exercises

0408. NBC training needs to continue once the components of the Joint Force come together in-theatre. The higher the NBC threat the greater the requirement. The following needs to be covered:

- a. Validation by in-theatre exercises of the Joint Force NBC organisation.
- b. Integration and co-ordination of the various national components of the Joint Force NBC defence capability and, where relevant, the HN.

- c. The establishment, continuity training and exercise of NBC W&R cells, collection and control centres.
  - d. The establishment, continuity training and exercise of ‘during’ and ‘post-event’ NBC defence measure such as movement control, decontamination, reconnaissance, survey, monitoring and sampling teams.
  - e. The practice of commanders and staff in the command, control and co-ordination of operations in an NBC environment.
  - f. Continuity training for Joint Force personnel to match NBC measures and procedures to in-theatre conditions.
  - g. The insertion of realistic NBC conditions into general exercises so that the components of the Joint Force are practised in their ability to operate in an NBC environment and appreciate the effect NBC events may have on operations.
  - h. Equipment.
0409. NBC equipment needs to be deployed on arrival in-theatre in accordance with the JFC’s NBC defence plan. Items need to be checked for correct functioning under local conditions and, where relevant, integrated with the equipment of other Joint Force contingents. An integrated re-supply chain for NBC consumables needs, where possible, to be established between the various Joint Force components.
0410. **Equipment Protection.** The JFC and the Joint Force staff need to make an assessment of the protection and hardening of the Joint Force’s equipment. Commanders need to be aware of any NBC survivability weaknesses in their equipment and adopt appropriate protection or handling precautions (Section V to Chapter 2). There is a particular need to protect all IT equipment and sensitive surveillance equipment from all NBC hazards. For example:
- a. In a high nuclear threat environment, all electronic and electrical equipment will be at risk from the degradation and damage caused by Electromagnetic Pulse (EMP) and Transient Radiation Effects on Electronics (TREE). All equipment needs to be operated correctly with cable runs as short as possible and with correct earthing. Power levels need to be minimised and all non-essential equipment switched off. Where possible doors and hatches need to be kept shut.
  - b. Where the risk of NBC contamination is high, every hazard management precaution needs to be taken so that vulnerable assets do not come into contact with NBC agents, particularly liquid chemical. Precautions include the use of cover, the avoidance of contaminated areas and movement control.

## Pre-Hazard Precautions

0411. Pre-hazard precautions include the use of cover, camouflage, concealment and dispersion of the Joint Force to avoid NBC weapon effects and hazards. These measures need to be integrated into the Joint Force deception and emission control plan. Precautions need to be planned and prepared pre-event because, particularly if the nuclear threat is significant, considerable time and resources may be needed. For example, field defences, shelters, structures and buildings will need to be strengthened and reinforced against blast effects. Where possible reserve forces, and reserves of equipment and line replaceable items, need to be created so that in the face of an NBC threat a degree of redundancy is built into the capability of the Joint Force. These reserves can then be used to replace contaminated forces and contaminated or damaged equipment.
0412. **Food and Water.** General precautions need to be taken to protect food and water from NBC hazards. Supplies should not be left unpacked or opened and they need to be stored under cover. Proper storage is a logistic responsibility. The monitoring of food and water is a medical responsibility.

## Medical Precautions

0413. The timeliness and accuracy of intelligence, including any warning, can directly enhance the success of medical countermeasures and response. It is important that commanders gather information from epidemiological and environmental threat assessments associated with specific geographical locations. This needs to begin prior to deployment and continue on arrival in-theatre. Commanders need to establish and maintain a medical surveillance program that provides a database on actual medical hazards in their respective Tactical Area of Responsibility (TAOR); details of personnel exposed to the medical hazards; and the treatments provided.
0414. A biological attack may not be detected directly. The first indication may be an increase in illness among the effected population where medical specialists may find it difficult to differentiate between the occurrence of natural endemic disease and an attack by an adversary. Therefore, commanders need to ensure that their personnel are continuously monitored for potential disease. Further, accurate and complete medical record need to be maintained for personnel to assist with long-term medical screening.
0415. Preparatory countermeasures to the medical effects of NBC agents include immunisations, medical prophylaxis, medical pre-treatments and antidotes. There are no agreed standards for immunisation amongst NATO countries. Commanders need to be aware of the constraints associated with national guidelines relating to the immunisation of forces. Commanders need to ensure that these actions are carried out, on advice from the medical services, before any exposure to high-risk NBC conditions. The rapid spread of transmissible diseases will be less likely if Joint Force personnel are physically fit and they maintain a high standard of personal hygiene. High standards of general hygiene are also needed for food, drink, catering facilities and accommodation to prevent the spread disease.



## Section IV - During-Event Action

0416. **Introduction.** The equipment and procedure necessary for the protection of the Joint Force during an NBC event need to be made ready and exercised in the pre-event phase. This Section is concerned with the immediate response to an NBC attack or ROTA, including initial detection, warning and the implementing of individual and collective physical protection.

### Detection

0417. NBC events need to be detected at the earliest possible opportunity so that a timely warning can be given. The Joint Force needs to deploy point, remote and stand-off NBC detectors, as appropriate, to indicate the arrival or presence of NBC hazards. Detection may be possible in 3 main ways:

- a. By the use of Joint Force Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR) assets to identify incoming delivery means. However, it will often not be possible to distinguish between conventional and NBC munitions until they arrive. Once an NBC event has taken place, every attack in the JOA needs to be assumed to have an NBC content unless indicated otherwise.
- b. By the characteristic signs shown during the delivery of NBC weapon and agents and during NBC events. For example, air platforms flying straight and level, unusual weapon detonation, expended spray tanks or devices, and unusual clouds and smokes.
- c. By the reaction from NBC detection equipment to the arrival and presence of NBC hazards. Also, by the signs and symptoms of poisoning or disease in vegetation, birds, animals and humans.

0418. **Biological Warfare Events.** There are particular problems in recognising that a Biological Warfare (BW) event has begun. While detection can result in some countermeasures being activated, formal identification through the use of Sampling and Identification of Biological, Chemical and Radiological Agents (SIBCRA) procedures will be needed to provide a more complete level of treatment.

0419. Detection Capability:

- a. **Nuclear Detonation.** The Joint Force may only have a limited capability to automatically characterise nuclear detonations. However, the collation of reports from observers (NBC 1 reports) through the Warning and Reporting system followed by analysis will aid characterisation.
- b. **Radioactive Hazards.** Dose rate meters that indicate the rise and fall in gamma and beta emitting radiation levels can detect the presence or arrival of nuclear radiation. The detection of alpha emitting radiation requires specialist equipment, personnel and survey procedures and this may delay confirmation.

- c. **Biological.** The Joint Force may only have a limited equipment capability to detect biological and toxin hazards. However, the use of medical surveillance across the whole force can provide an alternative source of data.
- d. **Chemical.** Equipment is available for the detection of liquid and vapour nerve and blister agents. The Joint Force may only have a limited capability to detect blood, choking and incapacitating agents.
- e. **Toxic Industrial Hazard.** The Joint Force may only have a limited capability to detect TIH. However, it may be possible to supplement the capability from civilian resources if required and the potential hazard(s) can be identified in advance.

### Alarm

- 0420. Once an NBC event is detected, the alarm needs to be raised locally and a report made for subsequent assessment within the W&R chain. This will enable timely and appropriate protective measures to be taken by those at risk. Emergency signs and alarms are given in STANAG 2047. These cover imminent air attack, biological/chemical/radiological hazards and the 'all clear'. Warning of this alarm also need to be passed to all elements of the Joint Force using command and information systems (CIS), using the procedures agreed to in ATP 45. The Joint Force may only have a limited capability for the provision of automatic alarm for an NBC event or events. Graduated levels of NBC threat and associated protective measures are given in STANAG 2984.
- 0421. The raising and lowering of threat levels is ultimately the responsibility of the JFC and the staff. SOPs at all levels need to clearly establish responsibilities for dress state changes, the delegation of authority to subordinate commanders and methods of promulgation.

### Individual Protection

- 0422. NBC immediate action drills need to be carried out promptly and autonomously in response to attacks or warning of attack, thereby minimising casualties.
- 0423. **Risk Assessment.** Commanders need to assess the benefits and risks associated with wearing Individual Protection Equipment (IPE) and be aware of the physiological and psychological effects. Individuals may take significantly longer to complete tasks when NBC protective suits are worn, and up to twice as long when also wearing respirators. The field command function is likely to be significantly degraded.

### Collective Protection

- 0424. The plan for the distribution and employment of Collective Protection (COLPRO) needs to be prepared in the pre-event phase and implemented when the threat-state is high. The JFC and the staff may need to co-ordinate the COLPRO resources provided by the different force components so that the appropriate key Joint Force Command and Control (C2), working environments, rest and relief facilities and medical assets are protected. COLPRO facilities

and the occupants need to be protected within building and field defences from blast and fragment damage. The correct use and operation of facilities needs to be exercised during pre-event training. This is so that when an NBC event or events take place, COLPRO facilities can be activated with the minimum degradation to the continued operational tempo of the Joint Force.

## **Section V - Post-Event Actions**

0425. **Introduction.** This Section is concerned with the post-event measures necessary to limit the impact of NBC events on operations. The procedures, equipment and training necessary for effective W&R, recovery and control measures, hazard management and medical counter measures and support need to be prepared and practised in the pre-event phase.

### **NBC Warning and Reporting**

0426. Although W&R activity takes place post-event, an in-theatre system of W&R for NBC events and the resulting NBC hazards prediction needs to be in place so that the risk to the Joint Force is minimised. This system also needs to provide information to commanders and staffs at all levels with timely and accurate information about the NBC situation so that the appropriate mitigating counter measures can be taken. Guidance on precautions to prepare for any friendly nuclear strikes is given in STANAG 2104.

0427. After an NBC event, reports from the areas and forces involved need to be received and collated by HQs. This information is needed to allow the W&R system to establish:

- a. The time and place of the NBC event and the local weather and terrain.
- b. The type of NBC weapon system used, or the type of TIM released, and the likely hazard which will result.

0428. The W&R system, with an integrated hazard prediction capability, can then predict the probable hazard areas, the likely NBC hazard and the extent of any downwind spread. The results then need to be passed to forces in possible downwind hazard areas, other NBC control and collection centres and the Joint Force staff so that an estimation of the effect NBC hazards may have on operations can be made.

### **Reconnaissance and Survey**

0429. There will be a need to establish the nature and location of NBC hazards so that effective post-event operational planning and hazard management can take place. Likely hazard areas can be predicted by the hazard prediction system but NBC reconnaissance will be needed to confirm the location, characteristics and possible duration of NBC hazards. In areas critical to the achievement of the commander's intent more detailed survey will be needed. Joint Force staffs need to identify the operational need for additional NBC information based on advice from the W&R organisation. They also need to devise the plan, task forces and co-

ordinate the effort so that resources are used effectively. The JFC and subordinate commanders are responsible for the decision to deploy NBC reconnaissance.

### Identification

0430. Early identification of the NBC or TIM hazards is needed to determine the defensive measures and medical countermeasures needed to mitigate the consequences.

### Monitoring

0431. NBC and TIM hazards can be significantly affected by a number of factors including weather, terrain, time of day and their own decay. Monitoring is required to determine if a hazard is still present on terrain, equipment or personnel. Surface monitoring of personnel and equipment is also needed to ensure that dress states and the safe use of COLPRO are correctly maintained.

### Recovery

0432. Post-attack recovery measures are needed to control the destruction which nuclear weapon effects may cause. The immediate nuclear detonation effects of thermal pulse and blast can cause widespread destruction and fires. If the nuclear threat to the Joint Force is significant, the JFC and the Joint Force staff may need to allocate considerable resources to recovery efforts. Plans will need to be prepared and exercised in the pre-event phase. Forces around the edge of the strike zone need to fight fires, rescue casualties, provide first aid and provide casualty evacuation.

### Hazard Management

0433. Hazard management comprises pre-hazard precautions taken pre-event and covered above in paragraph 411. Post-event hazards need to be controlled using the measures given below.
0434. **Hazard Control.** A Joint Force hazard management plan needs to be prepared pre-event so that hazards can be controlled by the use of avoidance, control of spread, exposure management and decontamination. The plan need to be implemented post-event depending on the nature and extent of the hazard established after NBC reconnaissance and W&R and a re-assessment of operational priorities.
0435. **Hazard Avoidance.** NBC hazards needs to be avoided if at all possible. After an NBC event or events commanders and staffs will need access to accurate and timely NBC hazard information so that the risk and penalties of hazard contamination can be balanced against other operational priorities. The following activities will need to take place:
- a. **Marking.** Areas of NBC hazard need to be marked so that forces do not enter and risk becoming contaminated. Initial hazard marking is carried out by forces at the hazard area in accordance with STANAG 2002. However, at formation level

marking needs to be planned and co-ordinated by the J3 NBC staff based on the information provided by NBC reconnaissance and the W&R chain.

- b. **Route Planning.** Commanders and staff need implement a Joint Force plan for the use of routes to avoid areas of NBC hazard. Where it is impossible to avoid known hazard areas, roads and tracks need to be used, and vegetation avoided, to minimise any pick up of hazard material.
  - c. **Movement Control.** All movement within a hazard area needs to be minimised and the strict control of all movement from and into the area needs to be strictly controlled. This needs to be achieved by implementation of the Joint Force route plan and the setting up of a clean/dirty hazard control line and points on routes leading into or through the hazard area.
  - d. **Relocation.** Commanders and staffs need to assess the consequences of hazard areas on Joint Force operations. Forces within the hazard area or close to the hazard area need, if possible, to be moved to clean areas. The consequence of such a move to the achievement of the mission and the penalties of the possible spread of hazards needs to be assessed. The rotation of forces through the hazard area, covered below, is an alternative.
0436. **Control of Spread.** Once hazard areas have been identified commanders and staffs need to implement measures to limit their spread. Any spread of NBC hazards is likely to risk the contamination of personnel and operational assets. Once this takes place personnel will need to wear respirators for much longer if IPE becomes contaminated, if contaminated assets move through clean areas, and when contaminated platforms are maintained or repaired:
- a. **Limitations of Spread.** Forces moving out of a hazard area need to be checked for hazard, and decontaminated if feasible operationally. The movement of contaminated forces outside of the hazard area needs to be controlled and warning provided to other forces in clean areas. There will also be a need to control the movement of contaminated civilians and their effects. Only mission critical assets can be allowed to move into or through a contaminated area, if justified by the operational need. Areas contaminated by TIM need to be isolated because IPE may not offer full protection against many TIH. EOD teams will need advice from J3 NBC when planning for the destruction or disablement of NBC munitions to minimise the risk of any release of toxic material or NBC agents, additional guidance is give in **Annex E**.
  - b. **Restriction of Movement.** Restriction of movement measures need to be planned between J4 Medical and J3 Operations, with support from J1 Provost, to control any spread of disease caused by transmissible biological hazards.
  - c. **Hazard Containment.** Physical containment by the use of barriers, holding tanks, shielding, encapsulation and burial may be needed to control the spread of NBC and TIM hazards and waste products. This needs to be planned by J3 NBC with J4 Logistics with the work being carried out by engineer and logistics assets.

- d. **Waste Management.** The waste products from the removal of hazards from contaminated forces, or the removal of contaminated covers, need to be contained and marked in accordance with STANAG 2002. Waste sites will need to be planned by J4 Logistics with advice from J3 NBC and possibly J9 CIMIC. They will need to be restored once operations are complete.
0437. **Exposure Management.** The exposure of all personnel to hazards needs to be ALARA as explained in Section VI to Chapter 1. It is possible that conflict may take place in or near NBC or TIM hazard areas. The local commander needs to balance the successful outcome of the mission with the maintenance of the ALARA principle. Guidance needs to be included on this balance in the JFC's and subordinate commander's concept of operations which may need to be updated from time to time as additional information becomes available from the NBC IPB:
- a. **Exposure Control.** International recommendations, and the national regulations of the various force components, cover the management of exposure to ionising radiation. There are also various regulations covering the exposure of personnel to other TIH. However, these are yet to become as pervasive as the ionising radiation regulations covered below. The Joint Force radiation exposure plan and the JFC's Operational Exposure Guide (OEG) need to be prepared in the pre-event phase. This will be based on the NBC IPB and the results of in-theatre reconnaissance and survey of local nuclear and radiological TIM facilities. Commanders and staffs, advised by J3 NBC, need to ensure that:
- (1) Exposure to radiation hazards is recorded by the issue and use of individual and group reading dosimeters, as appropriate to national force components.
  - (2) Exposure of groups to radiation is controlled by the calculation of nuclear radiation exposure states (RES) and control doses so that the radiation doses received by groups are evenly distributed in accordance with STANAG 2083.
  - (3) Additional guidance to commanders on the exposure of personnel to radiation is given in STANAG 2473. Long-term medical records need to be maintained for all Joint Force personnel after any exposure to any ionising radiation above normal local background radiation in accordance with STANAG 2474.
- b. **Data Recording.** The exposure of all Joint Force personnel to hazards need to be recorded. This is so that, where practical, expose levels can be made similar across the Joint Force and the long-term health of individuals can be managed.
- c. **Rotation of Assets.** If it necessary for operational reasons to maintain forces in hazard areas, then commanders and staff need to plan to rotate other forces through the area. This is so that exposure to hazards is kept as even as possible throughout the force in accordance with the ALARA principle. Such rotation will require considerable planning effort by the Joint Staff if forces in the hazard area have been

or become contaminated by hazards. Movement control to limit spread and decontamination may also be needed.

0438. **Decontamination:**

- a. **Passive Decontamination.** Commanders and staffs need to decide whether contaminated resources or ground should be decontaminated or left unused for passive decontamination by weathering and decay to take its course. The operational need for the assets is to be balanced against the time needed and penalties involved in removing contamination. If weathering and decay are used, special downwind areas need to be designated for assets or ground and monitored periodically.
- b. **Active Decontamination.** When an NBC event occurs, personnel and units need to carry out immediate and operational decontamination. Commanders need to implement decontamination priorities depending on the operational need for the contaminated assets as given in Section VI to Chapter 2. There are likely to be limited decontamination resources available to the Joint Force for anything above operational decontamination. Therefore, commanders need to plan for the readiness, location, and priority of use for decontamination assets and instigate hazard control measures for decontamination and the subsequent handling and disposal of contaminated waste. Depending on the degree of operational priority, the impact of decontamination operations on both the environment and local civilian infrastructure needs to be considered.

**Medical Countermeasures and Support**

0439. Medical management of NBC casualties may involve large numbers of personnel with infectious diseases, exposure to chemical agents and/or toxins, and injuries resulting from nuclear weapons. The medical services are likely to need considerable planned logistic and manpower support for the successful management of such casualties.
0440. **Casualty Evacuation.** Commanders need to consider the provision and control of evacuation assets within and outside hazard areas. While the need for rapid evacuation to initial medical care remains vitally important for NBC and conventional casualties, evacuation within contaminated areas will be hindered by the need to continue NBC defensive measures. Pre-planning for evacuation assets and the positioning of medical support facilities will be needed to reduce evacuation times. Ideally casualties should be uncontaminated prior to evacuation. However, it may not be possible to decontaminate all casualties at the point of wounding prior to evacuation to initial medical care. The use of casualty bags may be considered for the safe evacuation of casualties from an NBC environment.
0441. **Medical Re-supply.** Casualty treatment and evacuation will generate considerable demands for the re-supply of medical supplies and other NBC consumables. This will be caused by the use of casualty protective equipment, decontamination, contaminated waste and the need for fresh IPE and respirator canisters for clean casualties. There will also be a need for the

re-supply of COLPRO filters (if used), oxygen, drugs for both prevention and treatment and medical equipment.

0442. **Medical Support.** Additional medical support information is given in **Annex F**.

## **Section VI - Post Event Re-assessment**

0443. **Mission Review.** Once an NBC event has taken place within the JOA, and all the pre-event, during event and post event actions have been taken or are in hand, the JFC and the Joint Force staff need to review the operational situation in the light of the NBC event or events and an updated NBC threat assessment. The options open to the JFC are likely to be:

- a. Continue the mission as before.
- b. Continue the mission but in a modified form to minimise the impact of the NBC event or events.
- c. It is not possible to continue the mission because NBC hazards are so severe and direction is needed from the Strategic Command.

0444. **Lessons Learned.** Operations provide the best evaluation of capability and NBC defence is no exception. Lessons learned need to be identified and acted upon so that the changes needed to the NBC defence capability of the Joint Force are implemented in policy, organisation, equipment, procedures and training. Changes will also need to be implemented within NATO by the preparation of new NBC defence policy and STANAGs so that NBC defence capability meets the needs of all users.



## ANNEX A - A GUIDE TO NBC INTELLIGENCE PREPARATION OF THE BATTLESPACE AND SUPPORT

### Section I - Intelligence Preparation of the Battlespace

- A1. This Section provides a guide to the actions the NBC staff needs to take, in conjunction with the intelligence staff, to carry out the NBC IPB. The NBC Intelligence Preparation of the Battlespace (IPB) process is the staff tool that helps identify and answer the commander's Priority Intelligence Requirements (PIRs) and is the first step in the Joint Force Commander's (JFC's) operational planning process (OPP). The IPB is a cyclical process that occurs before and concurrently with mission analysis and the other steps of the JFC OPP. It includes:
- a. Threat evaluation.
  - b. Area of operations evaluation.
  - c. Terrain analysis.
  - d. Meteorological evaluation.
- A2. **Threat Evaluation.** The NBC staff need to assess the vulnerability of the Joint Force to NBC weapons and Toxic Industrial Material (TIM):
- a. **Evaluate the Threat.** Evaluate the composition, disposition, capability and intent of an adversary.
  - b. **Assess Vulnerability.** Vulnerability needs to be assessed against nuclear, biological, chemical and radiological weapons, however the assessments follow the same steps:
    - (1) Determine if the adversary has a capability by examining industrial and military infrastructure, access to precursor agents, potential storage and dual use facilities.
    - (2) Determine the types and effects of biological and chemical agents and radiological weapons that the most likely to be used and the 'worst case'.
    - (3) Determine/estimate adversary's probable nuclear yields.
    - (4) Determine the adversary's tactics for employment.
    - (5) Identify the adversary's national policy on use.
    - (6) Identify the capability for delivery.

c. **Determine Toxic Industrial Material:**

- (1) Identify and record facilities that have radioactive sources in the area of operations (for example hospitals, nuclear, metallurgy and pipeline construction facilities).
- (2) Identify and record any industrial facilities (agriculture, pesticide and research) that could produce and process biological agents.
- (3) Identify and record known chemical industrial plants and storage facilities.

A3. **Area of Operation Evaluation.** Identify the areas of operations and interest and conduct an in-depth evaluation to describe the battle space:

a. **Topography.** Where is the adversary likely to use NBC weapons?

b. **Population Demographics:**

- (1) Where are the densely populated areas?
- (2) What is the relative distribution of different ethnic/national groups?
- (3) What diseases are indigenous to the area of operations? In the case of multinational operations, also determine diseases that are indigenous to the homeland of the participants.

c. **Political/Socio-Economic.** Does the adversary have allies that might add to their capability or trading partners to sell them weapons?

d. **Infrastructure:**

- (1) Is the transport and communications network efficient or cumbersome?
- (2) Are there industrial chemical plants or nuclear power facilities that the adversary might target?
- (3) What is the civil response capability (hospitals, clinics and medical treatment facilities) that could handle patients from an NBC or TIM incident?
- (4) What industrial plant or facilities contain TIM which can create a hazard if targeted and damaged?

e. **Rules of Engagement and Legal/Religious Restrictions.**

- (1) Is the adversary a treaty signatory and have they abided by treaties in the past?

- (2) Are there significant moral, legal or religious sanctions for or against the adversary's use of NBC?

A4. **Terrain Analysis.** The terrain is analysed to determine its military significance and how it will affect operations in an NBC environment. For example, large forests magnify the obstacle producing effects of nuclear and chemical weapons and defiles are possible targets for chemical weapons.

- a. What effect will terrain have on NBC weapons?
- b. Where does NBC weapon use cause the most problems to our operations?
- c. How will the effects of NBC agents differ in open terrain and heavily vegetated areas?
- d. How will urban terrain affect NBC agents?
- e. Can/will adversary use NBC weapons to panic populations, to impede movement of attacking forces, and to impose protective requirements on forces and civilian populations?
- f. Will reduced sanitary conditions increase the available growth medium for biological organisms with the result that naturally occurring biological agents and vectors will increase the health risks to military and civilians?
- g. How many civilian laboratories and major industrial facilities are located in populated areas?
- h. What are the locations of critical terrain features (defiles, choke points, rivers, high ground, avenues of approach and mobility corridors)?
- i. What protection will terrain provide (cover and concealment)?
- j. Where are the sources of water and areas suitable for decontamination operations?

A5. **Meteorological Analysis.** Detailed weather information such as temperature, humidity, wind-speed, wind direction, precipitation and stability needs to be obtained to determine the effects on the employment of NBC weapons.

- a. What effect will weather have on the employment of NBC weapons and how will it affect the spread of NBC hazards?
- b. Over the next 72 hours, when is the weather favourable or unfavourable for the use of NBC weapons?

## Section II - Intelligence Support

- A6. **Introduction.** The intelligence staff needs to consider the NBC potential of possible adversaries to support NBC defence operations. Examples of the sort of information that needs to be considered are listed below.
- A7. **Intentions.** Have they embraced the use of NBC weapons either tactically or strategically in the past? What are their current aims? Do they view the use of NBC weapons as an acceptable form of warfare? Are they worried of retaliation in kind? Have they ratified and do they comply to any treaties, conventions or protocols associated with NBC weapons and NBC testing?
- A8. **Doctrine.** How do they employ NBC weapons (massive strikes/selective targets/only after escalating from conventional fighting/from the outset of a conflict)? What would they normally target (fighting echelons, headquarters, logistics concentrations, communications nodes, airfields and port facilities)? Do they have a NBC defence capability and do they deploy with it: detection, reconnaissance, survey, monitoring, force protection (individual and/or collective) and decontamination?
- A9. **Forces:**
- a. **Political Will.** Assess the political will of the aggressor to use NBC weapons and the perceived support of both the nation state and bordering states. Assess what critical events may 'trigger' an aggressor's decision to use NBC weapons.
  - b. **State and Non-State Sponsored Terrorism.** The worldwide spread of terrorism makes it a threat that must be planned for even in military operations. The information required for planning and conducting operations include but are not limited to the following. What terrorist groups, irregular forces or factions have been associated with or are sympathetic to the advisory or any of the belligerents in the area of operations? Have they been identified as operating in any way in NATO nations? Have they a history of threatening countries for participating in coalition, UN or NATO operations involving their homeland? Have they a history of attacking countries for participating in coalition, UN or NATO operations?
  - c. **Military.** Do their military practise operations in a NBC environment? Have their military leaders been known to disregard political direction (either using weapons they are told not to or refusing to use weapons when ordered to)? Is the use of NBC weapons and agents part of their Concept of Operations (CONOPS)? Will they use NBC weapons and agents to overcome a lack of conventional forces (asymmetric warfare)? Are there any indications for an NBC event?

**A10. Weapons and Delivery Means:**

- a. **Weapons.** What NBC weapons or agents does the adversary or any of the belligerents or neighbouring states or states sympathetic to one or more of the belligerents possess. What types of weapons are available? Do they have multiple warhead/yields? What quantities are available, do they have stockpiles of the weapons or agents and do they have a production capability?
- b. **Delivery Means.** What delivery means are available? Can they be delivered using bombs, missiles, artillery shells, spray, rockets and/or special forces? What quantities of the delivery means are available and what ranges can they achieve?

**A11. Toxic Industrial Material.** The release of a TIM either deliberately or accidentally will affect the tempo of operations. Commanders and staffs need to be aware of all potential toxic industrial hazards (TIH) and sites which may provide a potential hazard. The following provides guidance on the information that is required to plan and conduct operations:

- a. **Toxic Industrial Radiological.** Have states or non-state belligerents involved in the area of operations been known to use or threaten to use improvised radiation devices? Have states or non-state actors involved in the area of operations been known to damage or threaten to damage nuclear reactors or radioactive source containers or facilities? What potential sources of radioactivity exist in the area of operation or areas adjoining the area of operations? What is the maintenance status of any nuclear reactors and radioactive source containers in the area of operations or adjoining the area of operations? What security exists around any potential radioactive sources?
- b. **Toxic Industrial Biological.** Have states or non-state actors involved in the area of operations been known to use or threaten to use industrial biological materials? Have states or non-state actors involved in the area of operations been known to damage or threaten to damage Toxic Industrial Biological (TIB) facilities? What potential sources of TIB exist in the area of operation or areas adjoining the area of operations? What is the maintenance status of any biological laboratories or biological containers in the area of operations or adjoining the area of operations? What security exists around any potential TIB facilities?
- c. **Toxic Industrial Chemicals.** Have states or non-state actors involved in the area of operations been known to use or threaten to use Toxic Industrial Chemicals (TIC)? Have states or non-state actors involved in the area of operations been known to damage or threaten to damage TIC facilities or storage/transportation containers/means? What potential sources of TIC exist in the area of operation or areas adjoining the area of operations? What is the maintenance status of any TIC facilities and storage/transportation containers/means in the area of operations or adjoining the area of operations? What security exists around any potential TIC facilities? Do they have a TIC defence capability and do they deploy with it

(detection, reconnaissance, survey, monitoring, force protection (individual and/or collective) and decontamination)?

## **ANNEX B - GUIDE TO AN NBC DEFENCE PLANNING ESTIMATE**

### **Planning Considerations**

B1. The commander needs to consider:

- a. Adversary or belligerents' NBC warfare employment and production capability, doctrine and possible Courses of Action (CoAs) and Concepts of Operations (CONOPs), equipment and acquisition programmes, medical capability and vaccination programmes, training and exercises.
- b. NBC related asymmetric terrorist, third party or covert activity.
- c. Weather and topography.
- d. Capabilities of friendly forces in NBC defence.
- e. Navigational constraints on ships in littoral waters.
- f. Airspace constraints over the Joint Operations Area (JOA).

### **Step 1 – Mission Analysis**

B2. The campaign plan:

- a. The Joint Force Commander (JFC) or commander's intent.
- b. The point of main effort.
- c. The end-state.

B3. Limitations:

- a. Constraints.
- b. Freedoms.

B4. Is the Mission achievable if under:

- a. Direct NBC attack?
- b. Hazards created by NBC attacks or Release other than NBC Attack (ROTA)?

### **Step 2 – Evaluation of Factors**

B5. Adversary/Belligerents' Intentions:

- a. Gain position of advantage.
- b. Deny friendly freedom of action.
- c. Reduce friendly operational capability.

B6. Friendly Forces' Capabilities:

- a. Detection, Identification and Monitoring.
- b. Warning and Reporting.
- c. Physical Protection.
- d. Hazard Management.
- e. Medical Countermeasures and Support.
- f. NBC defence specialist units and individuals.
- g. Support from other capabilities.

B7. Time and Space:

- a. Performance degradation.
- b. Orders process (increase time to account for degradation;  $\frac{1}{3}$  of time to self,  $\frac{2}{3}$  of time to subordinates).

B8. Movement, operational movement restrictions.

B9. Summary of Possible Tasks:

B10. Detection, Identification and Monitoring.

- a. Detection (including specialist Biological Warfare detection).
- b. Identification (including SIBCRA/laboratories).
- c. Monitoring.
- d. Reconnaissance.
- e. Survey.

B11. Warning and Reporting.

B12. Physical Protection (IPE, COLPRO, equipment).



B13. Hazard Management:

- a. Pre-Hazard Precautions.
- b. Hazard Control:
  - (1) Hazard avoidance.
  - (2) Control of spread.
  - (3) Exposure control.
  - (4) Decontamination.

B14. Medical Countermeasures and Support.

**Step 3 – Consideration of Courses of Action**

B15. Assessment of impact on:

- a. Command and control.
- b. Information.
- c. Combat power.
- d. Manoeuvre.
- e. Force protection.
- f. Combat service support.
- g. Host nation, non-governmental organisations (NGOs) and other agencies.
- h. Media.

**Step 4 – Commander's Decision**

B16. Inform NBC staff of commander's decision plus guidance/risk management.

**Step 5 – Development of the NBC Defence Plan**

B17. NBC defence plan integrated with overall plan.

B18. Impact of NBC defence measures on:

- a. Combat power.

- b. Subordinate formations/units battle procedure/ability to maintain tempo.
- c. Morale.

B19. Most appropriate NBC defence posture:

- a. NBC Threat level.
- b. Detection.
- c. Warning and Reporting.
- d. Physical Protection.
- e. Hazard Management.
- f. Medical Countermeasures and Support.
- g. NBC specialist units and individuals.
- h. Support from other capabilities.

B20. Rehearse plan and adjust accordingly.

# **ANNEX C – GUIDE TO THE NBC DEFENCE ANNEX TO THE JOINT TASK FORCE COMMANDER’S DIRECTIVE OR OPERATION ORDER**

## **SECURITY CLASSIFICATION**

(Change from oral/previous orders, if any)

Copy No [ ] of [ ] copies  
Issuing Headquarters [ ]  
Place of Issue (may be encoded) [ ]  
Date-Time Group of Signature [ ]  
Message Reference No [ ]

## **ANNEX [ ] (NBC) TO OPERATION ORDER NO [ ]**

References: (for example:)

- A. MAP SHEET .....
- B. ATP-45(B).

Time Zone Used Throughout the Order: [ ]

1. **SITUATION.** Include information affecting NBC defence that the directive or Operation Order does not cover or that needs to be expanded (do not repeat information).

a. **Enemy.** (For CRO include all belligerents). Refer to Appendix 1 The Intelligence Estimate, Appendix 2 The NBC Overlay and Appendix 3 Infrastructure.

(1) **Intentions.** Pol and mil, as relevant to NBC defence.

(2) **En Nuclear Offensive Capability and/or Activity** (if appropriate).

(a) Facilities, delivery systems, weapons/agent types, critical support/transport. Activities of NBC units and units with NBC delivery systems (inc ranges and locations). Inc unconfirmed.

(b) En capabilities/assets (e.g. recce, survey or decontamination).

(c) En employment doctrine (briefly) and expected employment (at operational and tactical levels), based on likely En course of action.

(3) **En BW Offensive Capability and/or Activity** (if appropriate). As above.

(4) **En CW Offensive Capability and/or Activity** (if appropriate). As above.

C-1

- (5) **En RW Offensive Capability and/or Activity** (if appropriate). As above.
  - b. **Friendly Situation.** Fr forces NBC defence capabilities.
    - (1) NBC defence specialist asset locations (parent and adjacent formations). Formations/units nominated to provide support to NBC defence/units (e.g. engns, water supply units).
    - (2) All arms units capable of assisting in NBC defence tasks locations (e.g. medium recce and units capable of chemical recce).
    - (3) Medical capabilities/assets (refer to Appendix 4).
    - (4) Briefing and training status in-theatre.
    - (5) Coalition partners and Host Nation NBC defence capabilities, to include Coalition partners' Maximum Permissible Radiation Dose / Control Dose.
  - c. **Attachments and Detachments.**
    - (1) NBC capabilities attached or detached to/from force (as required to clarify Task Organisation).
    - (2) Changes to Task Organisation occurring during the operation, including effective times or events.
  - d. **Climate.** Consider impact of climate on agent persistency and performance degradation of personnel.
2. **MISSION.** To deter the use of NBC weapons and to protect [formation] from NBC events so that they are able to accomplish the mission and maintain freedom of action.
3. **EXECUTION**
- a. **Concept of NBC Defence Operations.** How NBC defence will be integrated into the operation.
    - (1) NBC Defence Concept of Operations (i.e. overview how NBC defence will be integrated into the operation).
    - (2) Main Effort (ME) by mission and specialist NBC units for each phase of the operation.
  - b. **NBC Defence Tasks.** Detail NBC defence tasks.
    - (1) Tasks for NBC defence specialist units (specify for each).

- (2) Tasks not addressed by NBC defence specialist units, which specified units are to accomplish (e.g. recce, engr, EOD, aviation), including how to task them (specify for each).
  - (3) Tasks supporting units are to accomplish (e.g. logistic, medical, provost), including how to task them (specify for each).
  - (4) Common NBC defence tasks for all units (specify for each).
- c. **Meteorological Assets.** Meteorological data which will be provided, sources and update arrangements.
- d. **Co-ordinating Instructions.**
- (1) **Timings.** Timings directly related to NBC defence capability.
  - (2) **Detection, Identification and Monitoring.**
    - (a) NBC event info requirements, especially detection of first En use.
    - (b) Designated observer units
    - (c) **SIBCRA.** Who will order, who will conduct, sample collection and packaging, transportation (inc security) and destinations for immediate and detailed analysis.
  - (3) **Warning and Reporting.**
    - (a) Force W&R organization for NBC and ROTA (highlighting differences for each), inc disease casualty reporting procedures, especially reporting of first En use.
    - (b) Actions on high incidence of detector false alarms.
    - (c) Marking Contaminated Areas.
  - (4) **Protection.**
    - (a) NBC Protection Level (Dress State) guidance and delegated authority.
    - (b) Unmasking. Delegation arrangements for NBC unmasking, who can order and under what conditions.
    - (c) Platform fitted COLPRO readiness and priorities for use. To be rehearsed at [ ] (e.g. NBC Threat Level MEDIUM) and continuously running at [ ] (e.g. NBC Threat Level HIGH).

(d) Unhardened COLPRO readiness and priorities for use. To be rehearsed and in use (not overpressure) at [ ] (e.g. NBC Threat Level MEDIUM); full overpressure at [ ] (e.g. NBC Threat Level HIGH).

(e) Additional factors for aircrew.

(5) **Hazard Management.**

(a) Pre hazard precautions: cover, concealment, dispersal, and deception.

(b) Site security, control and containment at NBC/TIM hazard site.

(c) Liaison with local emergency services.

(d) Movement Control. Inc movement control measures (nominated contaminated MSRs).

(e) Restriction of Movement (e.g. units suspected of infection).

(f) Maximum Permissible Radiation Dose/Control Dose, and TIH Exposure Control. Inc how it is to be applied (i.e. across formation/unit or by occupation within formation/unit). Procedures for requesting change.

(g) Radiation Exposure Safety.

(h) Decontamination.

(1) Thorough Decontamination. When, how and where conducted, who may authorize it and how to task it.

(2) Clearance Decontamination. When, how and where conducted, who may authorize it and how to task it.

(3) Contaminated runoff control and disposal.

(4) Contaminated waste control and disposal.

(i) Disposal of NBC munitions.

(6) **Medical Countermeasures and Support.**

(a) NBC hazard pre-treatment issue and re-supply details, and who is authorized to initiate taking them.

(b) Nerve agent treatment issue arrangements and storage requirements.

(c) Evacuation of contaminated casualties.

- (7) **Media.** Media handling of NBC issues.

#### 4. **SERVICE SUPPORT**

##### a. **General.**

- (1) Refer to ADMIN/LOGS ORDER.
- (2) Give priority of distribution of supplies and rates of resupply by subordinate unit and control measures (summarise in a table).
- (3) State priority of support, locations of maintenance facilities, and other relevant information.
- (4) State the allocation and priority of provision of transport for NBC defence items (e.g. water, COLPRO).
- (5) **Host Nation Support (HNS).**
  - (a) List the type and location of HN facilities, assets or support.
  - (b) List the procedures for requesting and acquiring HNS.
  - (c) Highlight any limitations or restrictions on HNS.

##### b. **NBC Defence Equipment.**

- (a) Deployment instructions for NBC defence equipment.
- (b) **Individual Protective Equipment (IPE).** Any special instructions on care, maintenance or availability of IPE.
- (c) **Aircrew NBC Defence Equipment.** Any special instructions on care, maintenance or availability of aircrew NBC defence equipment.
- (d) **Additional Equipment.** Details of any additional NBC defence equipment Urgent Equipment Requirements: arrival, training, equipment support details (1st to 3rd Line), and compatibility constraints.
- (e) **Consumables.** Allocation of consumables (stock levels), storage requirements and resupply arrangements.
  - (1) IPE and self-treatment consumables.
  - (2) Aircrew consumables.
  - (3) COLPRO consumables.

- (4) Decontamination consumables.
  - (5) Other consumables.
- c. **Water.**
  - (1) Water consumption instructions.
  - (2) Water resupply arrangements.
- d. **Rations.** Rations handling in contaminated environment.
- e. **Medical and Hygiene.**
  - (1) Refer to Medical Appendix for info on vaccination, NBC casualty handling, NBC casualty evacuation (including air evacuation) and contaminated dead.
  - (2) Environmental hazard responsibilities and Environmental Health support.

## 5. **COMMAND AND SIGNAL**

- a. **Locations.**
  - (1) Location of NBC staffs.
  - (2) Location of all theatre NBC centres/cells.
  - (3) Location of thorough and clearance decontamination sites.
- b. **Chain of Command.** Designate chain of command for NBC defence issues (will generally follow normal chain of command).
- c. **Warning and Reporting.** Outline the force W&R arrangements.
- d. **STRIKWARN Messages.** Outline how Fr STRIKWARN messages will be actioned.
- e. **NBC Co-ord Conferences.** If NBC co-ord conferences are to be held, provide details of location, timings and attendance.
- f. **NBC Codewords/Nicknames.** Detail any NBC codewords or nicknames which will be employed.
- g. **EMP.** Outline the force EMP protection measures.
- h. **Signal.**



- (1) Outline nets which are to be used for NBC W&R.
- (2) Address any unique communications or digitisation connectivity requirements or co-ordination necessary to achieve NBC W&R.
  - i. **Special Signals Instructions.** E.g. First En use of NBC is to be reported using fastest possible means (e.g. for signal messages, use FLASH precedence. Special signal instructions to subordinate and supporting NBC defence units.

ACKNOWLEDGEMENT INSTRUCTIONS:

NAME (Commander)

RANK

APPOINTMENT

OFFICIAL: (Authentication)

APPENDICES: (These are not included in AJP-3.8.)

1. J2 Intelligence estimate.
2. J3 NBC Overlay and analysis of area of operations.
3. J2 Infrastructure (all sites, civilian and military, whose destruction could create a significant NBC or toxic hazard).
4. J4 Medical capabilities and assets.

DISTRIBUTION:

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## ANNEX D - A GUIDE TO NBC STANDARD OPERATING PROCEDURES

### Introduction

- D1. This Annex provides a guide to the subjects that may need to be included in NBC Standard Operating Procedures (SOPs). The subjects listed below cover the major components of NBC defence before an NBC event, during an event and after an event.

### Co-ordination

- D2. **Responsibilities.** The division and allocation of NBC defence responsibilities between the Joint Force staff, the NBC staff and the Warning and Reporting (W&R) organisation.
- D3. **Organisation.** The organisation necessary to achieve an effective NBC defence and the positioning of appropriately trained personnel, special teams and NBC W&R control and collection centres and cells.
- D4. **Equipment.** Responsibility for the provision, maintenance and re-supply of NBC defence equipment.

### Pre-Event Precautions

- D5. **NBC Equipment:**
- a. Scales or levels of issue.
  - b. The allocation of equipment items.
  - c. Procedures for maintenance and re-supply.
  - d. Prioritising items for decontamination.
- D6. **Electronic Protection.** Procedures for the protection of electronic and communications systems against the effects of nuclear weapons caused by Electromagnetic Pulse (EMP), Transient Radiation Effects on Electronics (TREE) and atmospheric ionisation.
- D7. **Pre-Hazard Precautions:**
- a. Planning measures for camouflage, concealment, the use of cover, deception and emission control to avoid targeting by NBC weapons.
  - b. Procedures for the provision of shelters (purpose-built or improvised) against NBC weapon effects. Procedures for the allocation of personnel to shelters and their control.

- c. Planning for the creation of reserves to replace contaminated or damaged assets.
- d. Procedures for pre-wetting of ships and for upper deck minimum effective crews.

**D8. NBC Threat Levels and Normal Protective Measures.**

- a. Responsibilities and procedures for raising or lowering NBC threat levels.
- b. Meaning of various NBC threat levels and alarms.
- c. Guidance on NBC Individual Protection Equipment (IPE) normally worn at each threat level.
- d. Guidance on risk/benefit assessment in order to reduce normal IPE worn.

**D9. Detection.**

- a. Procedures for the deployment and co-ordination of detection devices and alarms, other NBC equipment, sentries and observers so that NBC events are detected at the earliest opportunity.
- b. Threat level when periodic and continuous NBC monitoring and reconnaissance should begin.

**D10. Warning and Reporting.**

- a. **STRIKEWARN.** Procedures for warning friendly forces of friendly actions and latest/earliest time message should be sent. (STANAG 2104).
- b. **Warnings and Alarms.** The chain of warning and alarm (STANAG 2047). The methods of communication to be used, including redundancies.<sup>1</sup>

**D11. Medical Protection.**

- a. Procedures for the administration of appropriate vaccinations to personnel by the Medical Services, in the pre conflict period.
- b. Standards of hygiene, and procedures for the regular monitoring of food and water by the Medical Services as a precaution against the spread of diseases.
- c. Procedures for taking NBC pre-treatment.

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<sup>1</sup> ATP-45.

- D12. **Collective Protection.** Orders for the testing, erection and implementation of Collective Protection (COLPRO).

**During Event Immediate Actions**

- D13. **Emergency Alarms of Hazard or Attack.** (STANAG 2047).
- a. Forms of alarm for various hazards.
  - b. Who is authorised to sound/display and in what circumstances.
  - c. All-clear signals, and who may authorise and when.
- D14. **Individual Protection.** Immediate action drills on hearing alarms.
- D15. **Downwind Hazard Warnings.** Action to be implemented on receipt of a downwind warning.
- D16. **MEDEVAC.** Identify procedures and priorities for Medical Evacuation (MEDEVAC).
- D17. **Immediate Reporting.** Guidance on communications systems to be used and precedence of initial NBC reports.

**Post-Event Actions**

- D18. **NBC Warning & Reporting.**
- a. The chain of NBC W&R within the force and liaison with superior and flanking organisations.
  - b. Summary of the types of NBC reports to be used.
  - c. Guidance on communications and precedence to be used for NBC reports.
  - d. Summary of W&R duties for NBC cells, sub collection, collection and control zone and area centres (as appropriate).
- D19. **Identification:**
- a. Responsibilities and procedures for the initiation of hazard identification for the appropriate force management counter measures.
  - b. Responsibilities and procedures for the initiation of a Sampling and Identification of Biological, Chemical and Radiological Agents (SIBCRA) mission.

**D20. NBC Monitoring, Reconnaissance and Survey.**

- a. Procedures for the tasking, briefing and co-ordination of NBC monitoring, reconnaissance and survey.
- b. Guidance on implementation of monitoring, reconnaissance and survey operations.
- c. Subordination/responsibilities for specialist NBC reconnaissance and survey assets.

**D21. Health Surveillance.**

- a. Responsibilities and procedures for the monitoring of the health of personnel and reporting of any ill health arising from the delayed effects of NBC agents, particularly biological.
- b. Medical service responsibilities and procedures for the collection and analysis of disease reports, the retrospective recognition of NBC events and the identification of the agent responsible.
- c. Annotate personal medical records with NBC exposure information.

**D22. Medical Protection.**

- a. Procedures for taking biological agent treatment sets.
- b. Responsibilities and procedures for the administration of appropriate prophylactics.
- c. Procedures for the maintenance of personal hygiene at all force levels.
- d. Procedures for monitoring food and water and for purification, disinfecting and disposal (as appropriate).

**D23. Post Nuclear Strike Recovery.**

- a. The increase in resources allocated to fire fighting, rescue and first aid teams.
- b. Procedures for the concentration of recovery teams to the area of a nuclear strike to deal promptly with casualties and fires.

**D24. Hazard Management.**

- a. Pre-Hazard Precautions:
  - (1) Measures for camouflage, concealment, the use of cover, deception and emission control to avoid targeting by NBC weapons.
  - (2) Creation of reserves to replace contaminated or damaged assets.

b. Hazard Control Measures:

(1) Hazard Avoidance by:

- (a) Responsibilities and procedures for the marking and signing hazard areas by day and night.
- (b) Plans and procedures for the control of movement within, into and out of hazard areas.
- (c) Route planning to avoid hazard areas and identification of safe transit routes.
- (d) Plans and procedures to relocate forces to clean areas.

(2) Control of Hazard Spread by:

- (a) Plans and procedures to limit the spread of hazards by the control of the movement of contaminated forces and equipment.
- (b) Responsibilities and procedures for the physical containment of hazards.
- (c) Responsibilities and procedures for the identification of transmissible diseases (amongst personnel) by the Medical Services and for the prompt implementation of restriction of movement precautions.
- (d) Procedures for the control of waste contaminated covers and effluent from decontamination.

(3) Exposure Management by:

- (a) Responsibilities and procedures to ensure that exposure to hazards is kept to As Low As Reasonably Achievable (ALARA) and that such exposure is evenly distributed.
- (b) Responsibilities and procedures for the issue and use of doismetry, the calculations of Radiation Exposure States (RES) and Control Doses and the management of exposure to ionising radiation for all personnel.
- (c) Responsibilities and procedures for the recording of data on the exposure of personnel to hazards.
- (d) Planning and procedures for the rotation of forces and equipment into and out of hazard areas.

(4) **Decontamination.**

- (a) Responsibility for decisions on the type of active or passive decontamination to be carried out.
- (b) Responsibilities for the supply and control of decontaminants, manpower equipment and the control of waste.
- (c) The use of local/host nation and improvised resources.
- (d) Responsibilities for specialist NBC decontamination assets.

**D25. Casualty Management.**

- a. Responsibilities and procedures for the treatment of both NBC casualties and conventional injuries in personnel within NBC environments.
- b. Responsibilities and procedures for the decontamination of contaminated casualties.
- c. Procedures for the continued physical protection of all casualties within NBC environments.
- d. Responsibilities and procedures for the continued isolation of casualties suffering from transmissible disease.
- e. Responsibilities and procedures for the evacuation of all casualties within the operational area.



## ANNEX E - JOINT STAFF FUNCTIONS AND NBC DEFENCE

### Introduction

- E1. The particular aspect of NBC defence that the different Joint Staff areas need to consider are set out below. Those staff functions which have a particular relevance in an NBC environment are included within Chapter 3.

### J1 Personnel and Administration

- E2. **Morale.** Develop plans for the maintenance of morale in the face of large numbers of casualties caused by NBC weapon effects, particularly Biological Warfare (BW). Loss of morale can be minimised by the preparation of personnel by training (J7) and the prompt and effective control of NBC hazards.
- E3. **Postal Services.** Organise the screening of mail items for possible NBC contamination, with J3 Security.
- E4. **Safety.** Develop plans for minimising the exposure of personnel to Toxic Industrial Materials (TIM). Co-ordination the application of this policy between different national components, the Host Nation (HN) and other in-theatre agencies.
- E5. **Provost.** The Provost Staff and Military Police Assets can provide the following support:
- a. Disseminate route NBC hazard and contamination information and post visible warnings concerning NBC states along maintained Joint Force routes in accordance with STANAG 2002.
  - b. Implement effective Hazard Management policy by control of the movement of military forces, local populations and displaced persons through or out of contaminated areas.
  - c. Help to impose and maintain restriction of movement measures to control the spread of disease.
  - d. Maintain the chain of custody for samples in SIBCRA tasks as laid down in AEP 10 and 49 with support from NBC defence assets or provide evidence handling advice to Sampling and Identification of Biological, Chemical and Radiological Agents (SIBCRA) teams.
- E6. **Prisoners of War Administration.** Arrangements to protect Prisoners of War (PW) held in theatre against possible NBC hazards and Toxic Industrial Hazard (TIH).
- E7. **Casualty Reporting.** Accurate and complete medical reporting and records need to be maintained for all Joint Force personnel, particularly if they have been exposed to NBC hazards and TIH. This is to allow, if required, long-term medical screening.

### J3 Operations

- E8. **Orders.** Produce and distribute operation orders, including the appropriate NBC defence Annex.
- E9. **Joint Force Headquarters.** Assemble Joint Force Headquarters (JFHQ) and deploy to a site that has an appropriate degree of cover and protection against possible adversary NBC attacks. Any industrial facility or area needs to be carefully surveyed before consideration as a potential site for potential TIM releases from storage or residual ground contamination. Sites with restricted access that may be easy for an adversary to contaminate with NBC and/or TIM hazards should also be avoided.
- E10. **Force Organisation and Tasks.** Recommend force organisations for planned operations where due weight is given to the NBC defence capability of the national components and the need for specialist NBC support. Specify the tasks for force components based on the JFC's concept of operations and their NBC defence capability. In addition to general NBC defence capability, all the combat and logistic assets within the Joint Force may require an NBC reconnaissance, surveillance, monitoring and survey capability. This is so that timely and accurate hazard information can be provided after the release or discovery of an NBC event or events.
- E11. **Rules of Engagement.** Advise the JFC on applicable Rules of Engagement (ROE) and suggest the changes and/or additions needed to counter a possible adversary NBC threat and TIH risks, and after an adversary has used NBC weapons.
- E12. **Plans and Operations.** Monitor force components' plans and operations to support the JFC's campaign plan within the Joint Operations Area (JOA). The NBC defence factor will be important in the following areas:
- a. **Special Operations.** The consideration and assessment of the impact of Special Operations on an adversary's military and industrial infrastructure so that the risk of subsequent release of NBC or TIM hazards is minimised.
  - b. **Aviation.** Wide-area reconnaissance using detection and monitoring sensors to determine if radiological contamination exists and the concentration level/or dose rate. The use of Unmanned Aerial Vehicles (UAVs) to avoid the exposure of aircrew to NBC hazards. Develop plans with J4 Logistics and J4 Medical for the rapid evacuation of casualties by air after an NBC event.
  - c. **Meteorology.** Force meteorology assets need to provide meteorological data appropriate for NBC hazard predictions. This is so that the extent of a hazard can be accurately predicted in-theatre and those forces that may be affected by the hazard identified. Meteorological information is provided using the messages set out in ADatP-3 (STANAG 5500).

- E13. **Information Operations.** Include the NBC factor within the execution of the Joint Force Information Operations strategy to deter and disrupt possible adversary use of NBC weapons by the co-ordinated use of Special Operations, Intelligence, Civil Military Co-operation (CIMIC), Communications and Information Systems (CIS), joint command and Control (C2), targeting, Operations Security (OPSEC), Deception, Psychological Operations (PSYOPS), and Electronic Warfare (EW).
- E14. **Targeting.** Adversary NBC weapon facilities and stockpiles and the presence of industrial plants using TIM may limit JFC's targeting options. Such locations need to be identified and placed on a restricted target list so that there is proper assessment of the risk of possible hazard release after engagement with conventional or other types of weapons.
- E15. **Force Protection.** Force protection in accordance with the principles set out on Section 2 to Chapter 1 and integration with the Joint Force's NBC defence capability.
- E16. **Security.** Co-ordinate force security policy and plans to identify possible adversary use of terrorists, third parties, special forces and/or covert means to carry out NBC attacks.
- E17. **Refugees:**
- a. Co-ordinate and monitor refugee support operations to control possible population movement through the JOA to minimise the risk the spread of diseases and the covert dissemination of NBC and TIM hazards by an adversary.
  - b. The use of information operations, PSYOPS and CIMIC to minimise panic in local civilian populations caused by the possible spread of NBC and TIM hazards. For example, to arrange contingency plans with J5 Plans and J9 CIMIC for a 'stay at home policy' or ordered evacuation with the HN depending on the NBC and/or TIM risk.

#### **J4 Logistics**

- E18. **Logistic Planning Factors.** NBC defence operations place greater demands on the logistic system. Factors to be considered are:
- a. Requirements, priorities and procedures for decontamination and evacuation of materiel, supply, maintenance and administrative sites.
  - b. Re-supply of expended NBC protective clothing, decontaminants, and medical supplies.
  - c. Evacuation priorities, decontamination, treatment and isolation of NBC casualties or conventional patients who have been contaminated with NBC or TIM hazards.
  - d. Decontamination of food and water sources for human consumption.
  - e. The registration of graves, and the procedures for moving, decontaminating, and marking remains contaminated by NBC and/or TIM hazards.

- f. Measures to reduce the impact of the NBC environment on CIMIC.
- g. Procedures for handling mass casualties within a contaminated environment whether conventional, NBC, or both.
- h. The provision of showers or baths and a change of clothes at least once a week for all force personnel to maintain a high standard of force hygiene.

E19. **Explosive Ordnance Disposal of NBC Munitions.** When planning for the destruction or disablement of NBC munitions, all necessary precautions need to be taken to minimise the risk of any release of toxic material or NBC agents. This will include advice from NBC Defence specialist. Options for disposal depend on the type, condition and fuzing of the munition and the risk to personnel, resources and the ground location. The feasible disposal option selected by the Explosive Ordnance Disposal (EOD) team will always be that which presents the lowest risk. Options considered are:

- a. Evacuation of the munition, if it is safe to handle and transport, to a safer location. The evacuation of NBC munitions requires the establishment of transportation procedures. Commanders and staffs need to seek technical assistance from EOD organisations and other agencies.
- b. Rendering safe in accordance with EOD procedures.
- c. Marking and abandoning, having recorded the location.
- d. Destruction in place, the neutralisation of the BW/Chemical Warfare (CW) agents or their emptying from the munition into the appropriate storage and transport containers.

E20. An adversary's NBC munitions in danger of being recaptured, or those that pose a unique challenge to safety, may need to be destroyed in line with EOD procedures. Technical intelligence reports on all captured NBC munitions and fusing systems need to be raised before the evidence is destroyed.

## J5 Plans and Policy

- E21. Determine, on the basis of intelligence assessments, the military conditions and NBC defence capability for successful accomplishment of the JFC's assigned mission objectives. Action to be directed against the adversary's CoG and that required to protect friendly CoG is included. Develop courses of actions to accomplish the JFC's assigned mission.
- E22. Co-ordinate the JFC's overall Information Operations campaign plan by determining those actions necessary to influence the adversary's decision-makers not to use NBC weapons or TIM during possible conflict. Seek advice from J3 NBC on what measures need to be taken to protect friendly Command and Control systems against NBC weapons effect.

- E23. Provide planning guidance for the execution of the phases of the campaign, with particular emphasis on synchronisation of forces, time and area towards achievement of the campaign objectives and the appropriate distribution of NBC defence assets.
- E24. Conduct combat assessments using operational analysis of the impact of adversary NBC weapons and TIM and consequent Joint Force NBC defence postures as directed by the JFC.
- E25. Plan, in consultation with J9 CIMIC, for emergency relief assistance to local populations after possible adversary use of NBC weapons or a release of TIM.

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## ANNEX F - MEDICAL SUPPORT FOR NBC DEFENCE

### NBC Defence and Medical Support

- F1. There are a number of interrelated defensive measures that need to be included in planning medical support in an NBC environment. These include:
- a. **Intelligence.** Intelligence staffs can assist the in-theatre threat assessment by evaluating the state of a potential adversary's Biological Warfare (BW) effort. Local efforts to conduct operational medical investigations of disease resulting from analysis of enemy drugs, serums, and antibiotics can provide limited intelligence on suspected enemy biological agent employment. Intelligence staffs will gather data from the various medical units and non-medical units.
  - b. **The Estimate, Plans and Orders.** The J3 NBC staff and the J4 Medical staff need to work closely together to ensure that pre, during and post-event NBC defence and Medical measures are fully integrated. This integration needs to progress through all stages of planning for operations in the NBC and Medical estimate, plans and orders.
  - c. **Protection.** Physical defensive measures to reduce the risk of personnel inhaling any airborne NBC hazards that may be present; and early detection. Medical defensive measures are needed to protect personnel at risk against exposure, infection, or intoxication. Although the detection of a biological aerosol is not itself a medical countermeasure, medical diagnosis may play a key part in detection and identification of previously unidentified attack.
  - d. **Hazard Management.** NBC hazards will cause medical staff to work in NBC Individual Protection Equipment (IPE) thus reducing their efficiency. The decontamination of casualties before they receive medical treatment will be labour intensive as will the maintenance of medical collective protection facilities. The avoidance of NBC hazards will be a key factor in planning for the location of medical facilities. Contingency plans will be needed for:
    - (1) The movement of medical staffs and facilities out of hazard area and the labour and transport support to do so.
    - (2) The provision of additional medical, NBC defence and logistic support if medical assets need to remain inside hazard areas and continue to operate.
- F2. The J4 Medical Staff need to consider the following specific issues to support the NBC defence capability of the Joint Force.

### Preventive Medicine Principles

- F3. Medical personnel need to assist commanders and staffs to determine the health hazards associated with NBC and Toxic Industrial Materials (TIM) hazards. Preventive measures

associated with NBC defence operations need to be considered such as safe food and water sources, determining when to use prophylactics and immunisation. Medical personnel need to be aware of the NBC threat and TIM hazards in-theatre and be continually updated on diseases, potential disease vectors, and the susceptibility of force components to these diseases. In NBC conditions, diseases known to exist in the area may be manifested but not transmitted to our forces. The appearance of a disease or vector not known to exist naturally in-theatre is an indication that biological warfare agents may have been introduced into the area. Following an effective NBC attack, the application of general preventive medicine principles will be important.

- F4. In an emergency situation personnel are likely to become careless over safe food and water, sanitation, general hygiene and other common disease control measures. This can be a significant cause of the secondary spread of disease. The maintenance of safe water and food will differ for military personnel deployed throughout the operational area and for the civilian population.
- F5. Following an NBC attack all food (except tinned or otherwise well protected food) needs to be thoroughly inspected to ensure that adequate protection is provided. Foods determined to be safe also need to be protected against secondary contamination. Protective measures need to be practised by those who transport, store, prepare, and serve food, as well as by those who consume the food. In addition, control measures need to be applied to prevent the contamination of food by insects, rodents, and other vectors.
- F6. It is difficult to maintain satisfactory personal and area sanitation during intensive operations, particularly in unfamiliar climates. Strict measures are needed for waste treatment and sewage. Water surveillance and area water sanitation control measures need to be instituted. The best assurance of water sanitation is water purification or boiling. However, water purification tablets and military systems for boiling or purifying large amounts of water for consumption and hygiene purposes may not be effective against certain biological agents such as viruses, spores, or toxins.
- F7. Washing with soap and water is the most effective and simple personal hygiene measure for the control of communicable diseases. It is the responsibility of every member of the Joint Force to apply standard individual protective and sanitary measures as appropriate. Commanders and staffs need to ensure that the necessary facilities and opportunities for high standards of personal cleanliness are provided.

### **Medical Management**

- F8. Medical management of NBC casualties, particularly those caused by biological agents, may involve large numbers of individuals with infectious diseases, exposure to chemical agents and/or toxins and injuries resulting from nuclear weapons. Medical assets will need augmentation to decontaminate and evacuate casualties. The fact that the source of the exposure may have been artificially created by deliberate, hostile means will not change the basic principles of treatment. For example, after a biological attack the most important factor



in providing operationally relevant information and adequate medical management will be the rapid establishment of an accurate, specific identification of the agent.

- F9. In contrast to naturally occurring epidemics in which the disease incidence increases over a period of weeks or months, an artificially induced epidemic may peak in a few hours or days. Since a BW attack may be silent or nearly so, the first indication of a problem may be an increase of casualties without any indication of origin; symptoms of natural disease may be indistinguishable from those caused by deliberate attack. Onset of illness following exposure to biological agents may range from minutes to as long as 3 weeks. Some potential biological agents are infectious; thus, appropriate reaction to an attack may have important planning considerations.
- F10. Some aspects of medical management after BW attack are unique and require special alertness and training. Timely identification and communication of the threat is essential for survival. Casualties may not occur at the same time as they would in the case of a surprise attack with nerve agent. The degree of exposure to the agent and host resistance causes the onset of illness to be spread over a number of hours or days. An increasing casualty load is anticipated with relatively few initial casualties, with a greater number over successive hours or days until a peak is reached. An exception is an attack with biological toxin(s) that may immediately cause large numbers of casualties. As soon as the use of transmissible BW agents is suspected, all necessary steps are in order to avoid further spread have to be taken, including restriction of movement. These measures will have to be imposed notwithstanding the administration of post-exposure vaccination or antibiotics.
- F11. Collective protection and hazard management against NBC attacks are particularly important if the situation necessitates a prolonged stay in a presumed contaminated area. Medical management needs to provide adequate shelter, establish uncontaminated food and water intake and ensure specific treatment is available. There may be demands for military medical support to neighbouring civilian populations following an NBC attack or Release Other Than Attack (ROTA). This factor needs to be considered during the planning of NBC defence and medical support before operations begin.

### **Patient Evacuation**

- F12. In an NBC environment commanders need to consider what casualty evacuation assets (e.g. ground vehicles, aircraft, and personnel) are required in the hazard area. Cumbersome protective gear, climate, increased workloads, and fatigue, will greatly reduce the effectiveness of those involved with evacuation. Every effort will be made to limit contamination of evacuation assets. Patients may need to be decontaminated before transport.

### **Patient Decontamination and Triage**

- F13. The management and treatment of contaminated casualties will vary with the operational situation and the nature of the contaminant. Each medical asset needs to have a plan that can be put into effect immediately. Decentralisation is necessary because casualties must not be kept waiting for decontamination. All medical assets need to have appropriately scaled sets of

medical items and decontamination equipment for treatment of contaminated patients within their area. Patient decontamination serves three purposes:

- a. It prevents the patient's system from absorbing additional contaminants.
- b. It protects medical personnel treating the patient and other patients from NBC hazards.
- c. It limits the spread of NBC hazards.

F14. Medical treatment facilities will establish decontamination areas. When casualties arrive, they must be seen at a triage point and directed to the proper area. The triage officer must determine if the patients have a surgical or medical condition that requires priority over decontamination. Most decontamination can be accomplished by removing the outer clothing and footwear, usually before admission, and without interfering with medical treatment.

### **Medical Facilities**

F15. The following factors must be considered because of the medical unit location, threat capabilities, and the unique aspects of NBC operations:

- a. NBC attacks have the potential to cause large numbers of incapacitated casualties who need intensive medical support. In the first few hours after an NBC attack, medical facilities may be overloaded with casualties who require lengthy hospitalisation.
- b. At the same time as the patient load is increasing, other factors combine to complicate medical support operations. Operations in protective gear reduce individual and collective efficiency at a time when manpower requirements increase. Patient decontamination requires manpower and may reduce the number of personnel available to treat casualties. Heat stress in IPE will require more frequent rest breaks, further reducing care capability.
- c. Establishing and maintaining a facility with NBC Collective Protection (COLPRO) and continuously monitoring the air inside the shelter for contaminants calls for additional personnel. These procedures also decrease the capability to treat patients efficiently and effectively.
- d. The medical personnel of units located in NBC hazard areas may also become casualties.
- e. Contingency planning will be needed to provide support for medical assets forced to continue to operate within NBC hazard areas. Additional medical support needs to be considered to organise medical evacuation, isolation, restriction of movement, diagnosis and treatment in or at the borders of the NBC hazard area.

**Impact on Health Services Support**

- F16. NBC hazards will create a difficult environment in which to operate. Stress from protective gear, reduced visual and tactile senses, reduced communication capability, and a sense of isolation are all detrimental to military operations. The medical support system has several unique aspects that must be considered.
- a. Hazard contamination may be transferred to the medical treatment facility if patients are evacuated without being decontaminated. Patients having been exposed to nuclear, chemical, or non-transmissible biological agents must be decontaminated before they are admitted into the collective protective system. This is to prevent the medical staff from becoming casualties; ordinarily, the medical staff work without protective equipment.
  - b. Isolation of casualties following exposure to a suspected or confirmed transmissible BW agent will be essential to prevent secondary epidemics through person to person contact. Medical personnel need to use IPE. Separate medical facilities may have to be established and equipped to handle potentially infectious casualties.
  - c. Many medical support assets are fixed or possess limited mobility. They are often located near HQ activities and main supply routes; hence, they may need to continue to operate within the hazard area. Treatments cannot cease while the unit relocates.

**Production and Re-supply of Essential Medical Materiel**

- F17. Production of liquid and gaseous oxygen will not normally occur in an NBC hazard environment. Product transfer operations (gaseous and liquid) will also be curtailed unless medical and flight line requirements demand it. Supply and medical assets need to develop plans for an adequate re-supply of important materiel such as gases, cryogenic liquids, electrolytes, blood products, vaccines drugs and immunoglobines.

**Special Medical Augmentation for Operations in an NBC Contaminated Environment**

- F18. Decontamination operations are resource intensive. It is unrealistic to expect medical personnel to manage both medical treatment and decontamination of patients. Decontamination operations need, therefore, to be planned. Augmentation to provide decontamination support also needs to be addressed in planning. In the case of a suspected or actual BW event with transmissible agents, special support is required for restriction of movement, for sampling and transporting samples, for ensuring the rapid identification of BW agents and infectious diseases, and for carrying out field autopsies on victims or animals.

**Individual NBC/Toxic Industrial Materials Medical Countermeasures and Support**

- F19. Prior to deployment the vaccination of all personnel needs to be considered. This requirement is under the direction of the Medical Services, taking into account the NBC/TIM threat and risks in the Joint Operations Area (JOA) and the national guidelines of the Joint

Force components. The issue of prophylactic drugs in order to build up the resistance of the human body to chemical hazards and therapeutic drugs also needs to be considered, again in accordance with national guidelines. Provision needs to be made to re-supply individual NBC/TIM medical treatment kits.

**Specialised NBC/ Toxic Industrial Materials Medical Countermeasures and Support**

- F20. Specialised NBC/TIM medical treatment kits are to be available for all personnel, taking into account the NBC/TIM threat and risks in the JOA as well as the efficiency of the individual and collective NBC/TIM protection available.

## GLOSSARY OF TERMS AND DEFINITIONS

The terms and their definitions used within AJP-3.8 are drawn from AAP-6 '*NATO Glossary of Terms and Definitions*' and AAP-21 '*NATO Glossary of NBC Terms and Definitions*'. The terms given in these glossaries are not repeated here. Many of these terms are critical to the understanding of the Chapters and Annexes and are included in the text.

### **American, British, Canadian, Australian (ABCA)**

Standardisation programs under the control of the Navies, Armies and Air Forces of the United States, United Kingdom, Canada and Australia.

### **Alliance**

The result of formal agreement (a treaty) between two or more nations for broad, long-term objectives which further the common interests of its members. When the word 'Alliance' is written with a capital 'A', it refers specifically to NATO. (AJP-3)

### **Chemical Weapons Convention (CWC)**

Worldwide convention designed to eliminate chemical warfare.

### **Environment**

The environment will influence all joint operations. This includes climate, weather, oceanography, topography, accessibility, population and infrastructure. Maximum exploitation of the operational environment is vital to the successful conduct of joint operations. (AJP-3)

### **Force Protection**

Force Protection aims to conserve the fighting potential of the deployed force by countering the wider threat to all its elements from adversary, natural and human hazards, and fratricide. It minimises, and mitigates the effects of the threat from: overhead attack systems, weapons of mass destruction and environmental hazards. It also reduces the interference with military operations by the civil population, and the threat of attacks by extremists. (AJP-3)

### **Health Service Support**

All services performed, provided or arranged to promote, improve, conserve or restore the mental or physical well-being of personnel. (AJP-3)

### **Host Nation Support**

Civil and military assistance rendered in peace, crisis and war by a host nation to allied forces and NATO organisations which are located on or in transit through the host nation's territory. The basis of such assistance is commitments arising from the NATO Alliance or from bilateral or multilateral agreements concluded between the host nation, NATO organisations and (the) nation(s) having forces operating on the host nation's territory. (AJP-3)

**Information Technology (IT)**

The group of technologies that deal specifically with the processing, handling, communication and storage of information; their applications and associated software and equipment together with their interaction with humans and machines. (AJP-3)

**Intelligence Preparation of the Battlespace (IPB)**

The appraisal, expressed in writing or orally, of available intelligence relating to a specific situation or condition with a view to determining the courses of action open to the enemy or potential enemy and the order of probability to their adoption. (AJP-3)

**Multinational**

Adjective used to describe activities, operations, organisations, etc in which forces or agencies of more than one nation participate. *Also called combined.* (AJP-3)

**NATO Assigned Forces**

Forces in being which nations agree to place under the operational command or operational control of a NATO commander at the declaration of a specific stage, state or measure in the NATO Precautionary System or as prescribed in special agreements. (AAP-6).

**Operations Planning Process (OPP)**

The OPP is conducted in five phases Preparation, Warning, Deployment, Employment and Re-deployment. (AJP-3)

**Partners for Peace (PfP)**

Non-NATO nations invited to co-operate in achieving world peace.

**Standardisation**

The development and implementation of concepts, doctrines, procedures and designs to achieve and maintain the required levels of compatibility, interchangeability or commonality in the operational, procedural, materiel, technical and administrative fields to attain interoperability. Note: the three levels of standardization in ascending order are: compatibility, interchangeability and commonality. (AAP-6)

**Sustainability**

The ability of a force to maintain the necessary level of combat power for the duration required to achieve its objectives. (AAP-6)

**Tempo**

Tempo is the rate or rhythm of activity relative to the opposition, within tactical engagements and battles and between major operations. The joint force should conduct operations at a tempo and at points in time that best exploit friendly capabilities and their ability to generate combat power in time and space, while inhibiting its adversary from achieving the same goal. The JFC aims to dominate events, remain unpredictable and operate more quickly than the adversary's ability to respond effectively. If the own tempo exceeds that of the adversary, then the adversary can be forced to his culmination point. Tempo is often dependant on quality of preparations, timing of initiative and morale. Tempo incorporates the capacity of a joint force to make the transition from one operational posture to another. (AJP-3)

## GLOSSARY OF ABBREVIATIONS

This list of abbreviations contains abbreviations and acronyms commonly used in joint and multinational NBC defence operations. It is not exhaustive and a comprehensive list of abbreviations is contained in AAP-15.

|        |  |
|--------|--|
| ACE    | Allied Command Europe                            |
| ACLANT | Allied Command Atlantic                          |
| AFU    | Air Filtration Unit                              |
| AJF    | Allied Joint Force                               |
| AJP    | Allied Joint Publication                         |
| ALARA  | As Low as Reasonably Achievable                  |
| ALP    | Allied Logistic Publication                      |
| AO     | Area of Operations                               |
| AOR    | Area of Responsibility                           |
| APOD   | Air Port of Disembarkation                       |
| ATF    | Amphibious Task Force                            |
| ATP    | Allied Tactical Publication                      |
| ATUFT  | Aircraft Taken-up from Trade                     |
|        |  |
| BM     | Ballistic Missile.                               |
| BTWC   | Biological and Toxin Weapons Convention          |
| BW     | Biological Warfare                               |
|        |  |
| C2     | Command and Control                              |
| C2CS   | Command and Control Communications Systems       |
| C2IS   | Command and Control Information Systems          |
| C2W    | Command and Control Warfare                      |
| C3     | Command, Control and Communications              |
| C3I    | Command, Control, Communications and Information |
| CB     | Chemical and Biological                          |
| CBW    | Chemical/Biological Warfare                      |
| CCA    | Contamination Control Area                       |
| CCIS   | Command, Control Information Systems             |
| CIS    | Communications and Information Systems           |
| CIMIC  | Civil-military co-operation                      |
| CoG    | Centre of Gravity                                |
| COLPRO | NBC Collective Protection                        |
| CONOPS | Concept of Operations                            |
| CRO    | Crisis Response Operations                       |
| CW     | Chemical Warfare                                 |
| CWC    | Chemical Weapons Convention                      |

|          |   |
|----------|---|
| DGP      | Defence Group on Proliferation                                    |
| DU       | Depleted Uranium  |
| EMCON    | Emission Control  |
| EMI      | Electromagnetic Interference                                      |
| EMP      | Electromagnetic Pulse   |
| EOD      | Explosive Ordnance Disposal                                       |
| EU       | European Union  |
| EW       | Electronic Warfare  |
| FMB      | Forward Mounting Base   |
| FOB      | Forward Operating Base  |
| FRSA     | Force Rear Support Area   |
| GPS      | Global Positioning System   |
| GZ       | Ground Zero   |
| HAZMAT   | Military Hazardous Material                                       |
| HN       | Host Nation   |
| HNS      | Host Nation Support   |
| ICRP     | International Commission for Radiological Protection              |
| IED      | Improvised Explosive Device                                       |
| INFO OPS | Information Operations  |
| INR      | Initial Nuclear Radiation   |
| INTREP   | Intelligence Report   |
| INTSUM   | Intelligence Summary  |
| IPE      | Individual Protection Equipment                                   |
| IPB      | Intelligence Preparation of the Battlefield                       |
| IRF      | Immediate Reaction Forces   |
| ISTAR    | Intelligence, Surveillance, Target Acquisition and Reconnaissance |
| IT       | Information Technology  |
| JFC      | Joint Force Commander   |
| JFHQ     | Joint Force Headquarters  |
| JOA      | Joint Operations Area   |
| JRA      | Joint Rear Area   |
| LOC      | Lines of Communications   |
| MOOTW    | Military Operations Other Than War                                |
| MOU      | Memorandum of Understanding                                       |
| NAC      | North Atlantic Council  |
| NA5CRO   | NATO Non-Article 5 Crisis Response Operations                     |

## Abbreviations-2



|         |   |
|---------|---|
| NATO    | North Atlantic Treaty Organisation  |
| NBC     | Nuclear, Biological and Chemical  |
| NBCD    | Nuclear, Biological and Chemical Defence                                    |
| NGO     | Non-Governmental Organisation   |
| NIA     | Neutron Induced Activity  |
| OA      | Operational Analysis.   |
| OOTW    | Operations Other Than War   |
| OPCOM   | Operational Command   |
| OPCON   | Operational Control (also used to denote the NSTN (MHS))                    |
| OPLAN   | Operation Plan  |
| OPORD   | Operation Order   |
| OPP     | Operations Planning Process   |
| OSCE    | Organisation for Security and Co-operation in Europe                        |
| PF      | Protection Factor   |
| PfP     | Partners for Peace  |
| PI      | Public Information  |
| POD     | Point of Debarkation  |
| POE     | Point of Embarkation  |
| PSO     | Peace Support Operations  |
| RADIAC  | Radioactivity, Detection, Identification and Computation                    |
| RC      | Regional Command  |
| recce   | Reconnaissance  |
| R&D     | Research and Development  |
| RES     | Radiation Exposure State  |
| RF      | Reaction Forces   |
| ROE     | Rules of Engagement   |
| ROM     | Restriction of Movement   |
| ROTA    | Release Other Than (NBC) Attack   |
| RPOD    | Rail Point of Disembarkation  |
| RRF     | Rapid Reaction Forces   |
| RW      | Radiological Weapons  |
| SACEUR  | Supreme Allied Commander Europe   |
| SACLANT | Supreme Allied Commander Atlantic   |
| SHAPE   | Supreme Headquarters Allied Powers Europe                                   |
| SIBCRA  | Sampling and Identification of Biological, Chemical and Radiological Agents |
| SOP     | Standing Operating Procedure  |
| SPOD    | Sea Port of Disembarkation  |
| STUFT   | Ships Taken-up from Trade   |
| TACOM   | Tactical Command  |
| TACON   | Tactical Control  |

|      |  |
|------|--|
| TFA  | Toxic Free Area                            |
| TIB  | Toxic Industrial Biological                |
| TIC  | Toxic Industrial Chemical                  |
| TIH  | Toxic Industrial Hazard                    |
| TIM  | Toxic Industrial Materials                 |
| TIR  | Toxic Industrial Radiological              |
| TMD  | Theatre Missile Defence                    |
| TREE | Transient Radiation Effects on Electronics |
| UAV  | Unmanned Aerial Vehicle                    |
| UN   | United Nations                             |
| UNSC | United Nations Security Council            |
| W&R  | Warning and Reporting                      |
| WMD  | Weapons of Mass Destruction                |
| WME  | Weapons of Mass Effect                     |

**REFERENCES PUBLICATIONS****Refs, Pubs,  
STANAGs.****TITLE**

|             |   |
|-------------|---|
| BI-SC 80-3  | BI-STRATEGIC REPORTING DIRECTIVE VOLUME 4, NBC REPORTS (DRAFT)  |
| C-M(2001)41 | SPECIAL CONSIDERATIONS FOR BIOLOGICAL WEAPONS DEFENCE   |
| C/M(97)48   | ALLIANCE POLICY GUIDELINES FOR MILITARY OPERATIONS IN A NUCLEAR, BIOLOGICAL OR CHEMICAL (NBC) WEAPONS ENVIRONMENT             |
| ICRP (1990) | RECOMMENDATIONS OF THE INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION, ICRP PUBLICATION 60, ANNALS OF THE ICRP           |
| ICRP (1992) | PRINCIPLES FOR INTERVENTION FOR PROTECTION OF THE PUBLIC IN A RADIOLOGICAL EMERGENCY, ICRP PUBLICATION 63, ANNALS OF THE ICRP |
| MC 133      | NATO'S OPERATIONAL PLANNING SYSTEM  |
| MC 161      | GENERAL INTELLIGENCE ESTIMATE   |
| MC 317      | THE NATO FORCE STRUCTURE  |
| MC 319      | NATO PRINCIPLES AND POLICY FOR LOGISTICS  |
| MC 324      | THE NATO MILITARY COMMAND STRUCTURE   |
| MC 326      | MEDICAL SUPPORT, PRECEPTS AND GUIDANCE FOR NATO   |
| MC 327      | MILITARY CONCEPT FOR NATO PEACE SUPPORT OPERATIONS  |
| MC 334      | NATO PRINCIPLES AND POLICIES FOR HOST NATION SUPPORT PLANNING   |
| MC 343      | NATO MILITARY ASSISTANCE TO INTERNATIONAL DISASTER RELIEF OPERATIONS  |
| MC 348      | NATO COMMAND AND CONTROL WARFARE POLICY   |

Reference-1

ORIGINAL

| <b>Refs, Pubs,<br/>STANAGs.</b>      | <b>TITLE</b>  |
|--------------------------------------|---|
| MC 389                               | COMBINED JOINT TASK FORCE POLICY  |
| MC 400                               | MC DIRECTIVE FOR MILITARY IMPLEMENTATION OF ALLIANCE STRATEGY   |
| MC 411                               | NATO CIVIL-MILITARY CO-OPERATION POLICY   |
| MC 422                               | NATO INFORMATION OPERATIONS POLICY  |
| MC 458                               | NATO TRAINING AND EXERCISE POLICY   |
| STANAG<br>1040, ATP-2<br>(A), Vol. I | ALLIED NAVAL CONTROL OF SHIPPING MANUAL   |
| 1167, ATP-31                         | NATO ABOVE WATER WARFARE MANUAL   |
| 1173, ATP-1<br>(C) Vol. I            | ALLIED MARITIME TACTICAL INSTRUCTIONS AND PROCEDURES  |
| 1174, ATP-1<br>(C) Vol. II           | ALLIED MARITIME TACTICAL SIGNAL AND MANEUVERING BOOK  |
| 2002                                 | WARNING SIGNS FOR THE MARKING OF CONTAMINATED OR DANGEROUS LAND AREAS, COMPLETE EQUIPMENTS, SUPPLIES AND STORES |
| 2036                                 | LAND MINE LAYING, MARKING, RECORDING AND REPORTING PROCEDURES   |
| 2047                                 | EMERGENCY ALARMS OF HAZARDS OR ATTACK (NBC AND AIR ATTACK ONLY)   |
| 2070                                 | EMERGENCY WAR BURIAL PROCEDURES   |
| 2083                                 | COMMANDER'S GUIDE ON NUCLEAR RADIATION EXPOSURE OF GROUPS   |
| 2019, APP-6<br>(2003)                | MILITARY SYMBOLS FOR LAND BASED SYSTEMS   |

**Refs, Pubs,  
STANAGs.**

**TITLE**

|                     |   |
|---------------------|---|
| 2103, ATP-45<br>(B) | REPORTING NUCLEAR DETONATIONS, BIOLOGICAL AND<br>CHEMICAL ATTACKS, AND PREDICTING AND WARNING OF<br>ASSOCIATED HAZARDS AND HAZARD AREAS |
| 2104                | FRIENDLY NUCLEAR STRIKE WARNING   |
| 2111                | TARGET ANALYSIS - NUCLEAR WEAPONS   |
| 2112                | NUCLEAR, BIOLOGICAL AND CHEMICAL RECONNAISSANCE   |
| 2126                | FIRST AID KIT AND EMERGENCY MEDICAL CARE KITS   |
| 2133                | VULNERABILITY ASSESSMENT OF CHEMICAL AND BIOLOGICAL<br>HAZARDS  |
| 2143                | EXPLOSIVE ORDNANCE RECONNAISSANCE/EXPLOSIVE<br>ORDNANCE DISPOSAL (EOR/EOD)  |
| 2150                | NATO STANDARDS OF PROFICIENCY FOR NBC DEFENCE   |
| 2182, AJP-4         | ALLIED JOINT LOGISTIC DOCTRINE  |
| 2225                | TECHNICAL DATA FOR HANDLING CUSTODIAL NUCLEAR<br>WEAPONS  |
| 2352                | NUCLEAR, BIOLOGICAL AND CHEMICAL (NBC) DEFENCE<br>EQUIPMENT - OPERATIONAL GUIDELINES  |
| 2353                | EVALUATION OF NBC DEFENCE CAPABILITY  |
| 2358                | FIRST-AID AND HYGIENE TRAINING IN NBC OPERATIONS  |
| 2367, AAP-21        | NATO GLOSSARY OF NBC TERMS AND DEFINITIONS  |
| 2406, ALP-9         | LAND FORCES LOGISTIC DOCTRINE (ANNEX ON NBC DEFENCE)  |
| 2412, AXP-8         | THE EFFECTS OF WEARING INDIVIDUAL PROTECTION<br>EQUIPMENT ON INDIVIDUAL AND UNIT PERFORMANCE DURING<br>EXERCISES                        |
| 2426                | NUCLEAR, BIOLOGICAL AND CHEMICAL (NBC)<br>CONTAMINATION CONTROL POLICY FOR NATO FORCES  |

| <b>Refs, Pubs,<br/>STANAGs.</b> | <b>TITLE</b>  |
|---------------------------------|---|
| 2429                            | PERSONNEL IDENTIFICATION WHILE IN NBC INDIVIDUAL PROTECTIVE EQUIPMENT (IPE)     |
| 2434, APP-9                     | COMPENDIUM OF ALLIED LAND FORCES MESSAGES                                       |
| 2437, AJP-01<br>(B)             | ALLIED JOINT DOCTRINE   |
| 2451, AJP-3.8                   | ALLIED JOINT DOCTRINE FOR NBC DEFENCE   |
| 2461, AmedP-6<br>(C) Vol. I     | NATO HANDBOOK ON THE MEDICAL ASPECTS OF NBC DEFENSIVE OPERATIONS (NUCLEAR)      |
| 2462, AmedP-6<br>(C) Vol. II    | NATO HANDBOOK ON THE MEDICAL ASPECTS OF NBC DEFENSIVE OPERATIONS (BIOLOGICAL)   |
| 2463, AmedP-6<br>(C) Vol. III   | NATO HANDBOOK ON THE MEDICAL ASPECTS OF NBC DEFENSIVE OPERATIONS (CHEMICAL)     |
| 2471                            | FIXED WING CARGO AIRCRAFT CONTAMINATION CONTROL PROCEDURES (CACCP)              |
| 2473                            | COMMANDERS GUIDE ON LOW LEVEL RADIATION (LLR) EXPOSURE IN MILITARY OPERATIONS   |
| 2474                            | DETERMINATION AND RECORDING OF IONISING RADIATION EXPOSURE FOR MEDICAL PURPOSES |
| 2475, AmedP-8<br>(A) Vol. I     | MEDICAL PLANNING GUIDE OF NBC BATTLE CASUALTIES (NUCLEAR)                       |
| 2476, AmedP-8<br>(A) Vol. II    | MEDICAL PLANNING GUIDE OF NBC BATTLE CASUALTIES (BIOLOGICAL)                    |
| 2477, AmedP-8<br>(A) Vol. III   | PLANNING GUIDE FOR THE ESTIMATION OF NBC BATTLE CASUALTIES (CHEMICAL)           |
| 2490, AJP-3                     | ALLIED JOINT OPERATIONS   |

| <b>Refs, Pubs,<br/>STANAGs.</b> | <b>TITLE</b>   |
|---------------------------------|--|
| 2497, AEP-45                    | PROGRAMMER's MANUAL FOR REPORTING NUCLEAR<br>DETONATIONS, BIOLOGICAL AND CHEMICAL ATTACKS, AND<br>PREDICTING AND WARNING OF ASSOCIATED HAZARDS AND<br>HAZARD AREAS |
| 2500, AmedP-6<br>(B)            | NATO HANDBOOK ON THE MEDICAL ASPECTS OF NBC<br>DEFENSIVE OPERATIONS  |
| 2868, ATP-35<br>(B)             | LAND FORCES TACTICAL DOCTRINE  |
| 2827                            | MATERIALS HANDLING IN THE FIELD  |
| 2871                            | FIRST-AID MATERIAL FOR CHEMICAL INJURIES   |
| 2873, AmedP-7<br>(A)            | CONCEPT OF OPERATIONS OF MEDICAL SUPPORT IN NUCLEAR,<br>BIOLOGICAL AND CHEMICAL ENVIRONMENTS   |
| 2874, AmedP-8                   | PLANNING GUIDE FOR THE ESTIMATION OF BATTLE<br>CASUALTIES (NUCLEAR)  |
| 2879                            | PRINCIPLES OF MEDICAL POLICY IN THE MANAGEMENT OF A<br>MASS CASUALTY SITUATION   |
| 2909                            | COMMANDERS GUIDANCE ON DEFENCE MEASURES AGAINST<br>TOXIC INDUSTRIAL CHEMICALS (TIC)  |
| 2910, AXP-6<br>(A)              | NUCLEAR CASUALTY AND DAMAGE ASSESSMENT FOR<br>EXERCISES  |
| 2917, AXP-7<br>(A)              | CHEMICAL CASUALTY ASSESSMENT EXERCISE PUBLICATION  |
| 2941                            | GUIDELINES FOR AIR AND GROUND PERSONNEL USING FIXED<br>AND TRANSPORTABLE COLLECTIVE PROTECTION FACILITIES<br>ON LAND   |
| 2954                            | TRAINING OF MEDICAL PERSONNEL FOR NBC OPERATIONS   |
| 2984                            | GRADUATED LEVELS OF NBC THREAT AND ASSOCIATED<br>PROTECTION  |

Reference-5

| <b>Refs, Pubs,<br/>STANAGs.</b> | <b>TITLE</b>   |
|---------------------------------|--|
| 2999, ATP-49<br>(C) Vol. I      | USE OF HELICOPTERS IN LAND OPERATIONS - DOCTRINE   |
| 3680, AAP-6                     | NATO GLOSSARY OF TERMS AND DEFINITIONS (ENGLISH AND FRENCH)  |
| 3700, ATP-33<br>(C)             | JOINT AIR AND SPACE OPERATIONS DOCTRINE  |
| 3943                            | PHYSIOLOGICAL REQUIREMENTS FOR AIRCREW NBC DEFENCE ASSEMBLIES USED IN FLIGHT   |
| 3946                            | MAXIMUM DOSAGE OF NERVE AGENT VAPOUR TO THE EYES ACCEPTABLE FOR AIRCREWS   |
| 4145, AEP-4                     | NUCLEAR SURVIVABILITY CRITERIA FOR ARMED FORCES MATERIAL AND INSTALLATIONS   |
| 4155                            | NBC PROTECTIVE MASK AND FILTER CANISTER SCREW THREADS  |
| 4192                            | DESIGN CRITERIA AND CONSTRUCTION PARAMETERS FOR COLLECTIVE PROTECTION (COLPRO) FACILITIES ON LAND  |
| 4323                            | SPECIFICATION OF CALCIUM HYPOCHLORITE USED FOR BIOLOGICAL AND CHEMICAL DECONTAMINATION   |
| 4328, AEP-14                    | GUIDELINES FOR THE ARMOURED FIGHTING VEHICLES DESIGNER TO IMPROVE NUCLEAR RADIATION PROTECTION   |
| 4359, AEP-10                    | NATO HANDBOOK FOR THE SAMPLING AND IDENTIFICATION OF CHEMICAL WARFARE AGENTS   |
| 4360                            | SPECIFICATION FOR PAINTS AND PAINT SYSTEMS, RESISTANT TO CHEMICAL AGENTS AND DECONTAMINANTS, FOR THE PROTECTION OF LAND MILITARY EQUIPMENT |
| 4447                            | PERFORMANCE SPECIFICATION FOR A SHIP'S NBC AIR FILTER  |
| 4475                            | DESIGN CRITERIA FOR A NBC MASK DRINKING SYSTEM (MDS)   |



| <b>Refs, Pubs,<br/>STANAGs.</b> | <b>TITLE</b>   |
|---------------------------------|--|
| 4477                            | SPECIFICATIONS FOR PAINTS AND PAINT SYSTEMS RESISTANT TO CHEMICAL AGENTS AND DECONTAMINANTS FOR THE PROTECTION OF AEROSPACE EQUIPMENT              |
| 4510                            | APPROVED DRUG FOR USE BY SERVICE PERSONNEL IN THE PREVENTION OF RADIATION – INDUCED NAUSEA AND VOMITING  |
| 4511                            | CRITERIA AND EVALUATION PROCEDURES FOR APPROVAL OF DRUGS FOR USE BY SERVICE PERSONNEL IN THE PREVENTION OF RADIATION – INDUCED NAUSEA AND VOMITING |
| 4521, AEP-7                     | NUCLEAR, BIOLOGICAL, CHEMICAL (NBC) DEFENCE FACTORS IN THE DESIGN, TESTING AND ACCEPTANCE OF MILITARY EQUIPMENT                                    |
| 4524, AEP-25                    | NUCLEAR BLAST AND THERMAL TEST METHODS AND PROCEDURES  |
| 4548, AEP-38                    | OPERATIONAL REQUIREMENTS, TECHNICAL SPECIFICATIONS AND EVALUATION CRITERIA FOR NBC PROTECTIVE CLOTHING   |
| 4567, AEP-41                    | UNIFIED PROCEDURES FOR ELECTROMAGNETIC PROTECTION  |
| 4571                            | SPECIFICATION FOR RAPID HAND-HELD ANTIBODY-BASED ASSAYS  |
| 4590, AEP-49                    | SAMPLING AND IDENTIFICATION OF RADIOLOGICAL AGENTS (SIRA)  |
| 5500, ADatP-3                   | NATO MESSAGE TEXT FORMATTING SYSTEM (FORMETS)  |
| 6013, AWP-2                     | NATO METEOROLOGICAL SUPPORT MANUAL   |
| AAP-3                           | PROCEDURES FOR THE DEVELOPMENT, PREPARATION, PRODUCTION AND THE UPDATING OF NATO STANAGs AND ALLIED PUBLICATIONS (APs)                             |
| AAP-4                           | NATO STANDARDIZATION AGREEMENTS AND ALLIED PUBLICATIONS  |
| AAP-15                          | GLOSSARY OF ABBREVIATIONS USED IN NATO DOCUMENTS   |

Reference-7

ORIGINAL

**Refs, Pubs,  
STANAGs.**

**TITLE**

|        |   |
|--------|---|
| AEP-9  | NATO MANUAL OF SIMULATORS OF NUCLEAR WEAPONS<br>EFFECTS - SIMULATORS OF THERMAL AND OPTICAL EFFECTS |
| AEP-18 | EMP TEST METHODS AND PROCEDURES   |
| AEP-19 | NUCLEAR PROTECTION DESIGN CONSIDERATIONS FOR MOBILE<br>SHELTERS                                     |
| AEP-20 | EMP DESIGN AND TEST GUIDELINES FOR SYSTEMS IN MOBILE<br>SHELTERS                                    |
| AEP-21 | NATO RECOMMENDED CALIBRATION PROCEDURES FOR EMP<br>MEASUREMENT                                      |
| AEP-22 | A GUIDE TO TRANSIENT RADIATION EFFECTS ON ELECTRONICS<br>AT THE TACTICAL LEVEL                      |

Reference-8

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