

Lessons from the Gulf

— NBC Warning and Reporting

by Col Raymond A. Barbeau and CPT Pratya Sriwat

As the tension of conflict in the Persian Gulf increased in late summer 1990, all eyes focused on chemical warfare. U.S. soldiers' ability to fight and survive such warfare became a contentious issue. NBC training, both individual and collective, became a high priority.

American involvement in the Gulf region prompted intensified training and the fielding of newly developed equipment and automated information system peripherals. This article reflects XVIII Airborne Corps nuclear, biological, and chemical center's (NBCC) experience and lessons learned on the NBC warning and reporting system (NBCWRS) during Operations Desert Shield and Desert Storm.

Threat Warning System

During the early phase of force build up, XVIII Airborne Corps realized the need for a standardized NBC threat warning system (NBCTWS) and STANAG 2984. The NBCC developed and implemented the NBCTWS based on input from the 1st Cavalry Division. The NBCTWS is a color-coded system ranging from white (no threat) through green, amber, and red (attack imminent). The system is driven by all-source intelligence indicators concerning enemy capabilities and intentions to employ chemical or biological weapons.

Figure 1 represents an abbreviated version of the NBCTWS. This figure does not depict enemy actions that drive the probability of attack nor

does it include every recommended action.

To further interoperability, XVIII Airborne Corps recommended the U.S. Army Chemical School adopt and implement NBCTWS Armywide. Shortly after implementing the Corps-wide NBCTWS, the system was tested through a series of chemical staff exercises (CHEMEX) involving all facets of warning and reporting.

CHEMEX-I

CHEMEX-I involved units in the corps rear area (CRA). It exercised rear area base clusters through the NBC element (NBCE) of the rear area operations center (RAOC). The exercise involved the Corps NBCC, RAOC NBCE, Base, and Base Cluster Command Posts. The CRA consisted of 13 base clusters and 112

bases spread over 1,000 square kilometers in the Dhahran and Dammam areas of Saudi Arabia.

To minimize the number of controllers and evaluators, a time-released information package was provided to each base. These packages were also designed to keep the staff exercise rolling should a particular base become inactive during the exercise. Packages included various NBC 1, NBC 2, SPOT, SALUTE, and intelligence reports—some were useful, others were insignificant fillers. NBC 1 and 2 reports were generated using the automated nuclear, biological, and chemical information system (ANBACIS-I).

The overall scenario included multiple chemical strikes at different targets occurring in close succession,

NBC Threat Warning System		
Threat Condition	Attack Probability	Minimum Recommended Actions
White	Not possible	Continue CTT/survival skills
		Ensure CDE on hand
Green	Possible	Issue CDE, NAAK, NAPP
		Continue collective training
		ID decon requirement/resources
Amber	Probable	Increase MOPP as required
		Emplace detection devices
		Pre-position decon assets
		Cover supplies and equipment
Red	Imminent	Initiate use of NAPP
		Increase MOPP IAW METT-T
		Seek overhead cover

Figure 1. NBC threat warning system.

CHEMEX-I Lessons Learned

- Communication was the biggest shortfall due to the unfamiliarity of personnel with base cluster command and control. Rear area organization also contributed to the confusion since major subordinate units were dispersed in numerous bases, with normal operational command and control in effect. For instance, the Military Police Brigade Commander was responsible for force protection of his base which housed portions of a support battalion, a transportation unit, as well as units of one of his subordinate battalions. Figure 3, below, shows an example of the CRA communications network.
- Bases and base clusters developed a force protection chain of command which the NBCWRS followed. All information flowed between RAOC, base clusters, base commands as well as geographically adjacent clusters

and bases. With over 100 bases under 13 base clusters, the communication network was complex. Rear area NBCE personnel had to constantly familiarize themselves with the ever-changing organization of bases and base clusters. Other communication problems included the transmission of insignificant, erroneous and duplicate reports.

- False reports must be precluded at the lowest level. Unit level NBC personnel must understand there is always a chance that NBC 1 reports may contain erroneous or incomplete data. NBC personnel must become information sorters or filters. Weeding out duplicate or meaningless information means freeing up communication means. This reduced workload allows receiving NBCE to properly plot and disseminate confirmed data.

munication difficulties continued to plague exercise participants. However, NBCE personnel were extremely vigilant at filtering "bogus" information and did not allow it to reach the rear command post (RCP) NBCE.

Corps-Wide CHEMEX

While the Corps NBCC was conducting CHEMEX-I and II for the CRA, divisional NBCC were conducting similar exercises in preparation for a Corps-wide exercise. CHEMEX-III incorporated units in the covering force area (CFA), main battle area (MBA), as well as the CRA. ANBACIS-I was used to produce NBC reports for information packages. The eight-hour exercise went smoothly throughout its duration. The NBCWRS flow was well executed. Units not normally assigned or attached to the Corps became familiar with the field SOP (FSOP) and the strike serial number system. Participants also became acquainted with the basic capabilities of ANBACIS-I

ANBACIS-I

Although designed to operate on

Figure 2. CHEMEX-I lessons learned.

both geographically and over time. NBCE at base cluster and base levels were overwhelmed for two reasons. First, NBCE personnel were forced to face the difficulty of transmitting information to higher, lower, and adjacent units. Second, they were re-

quired to filter useless information. Key CHEMEX-I lessons learned are highlighted, above (figure 2).

CHEMEX-II

This second generation exercise also focused on the CRA. Com-

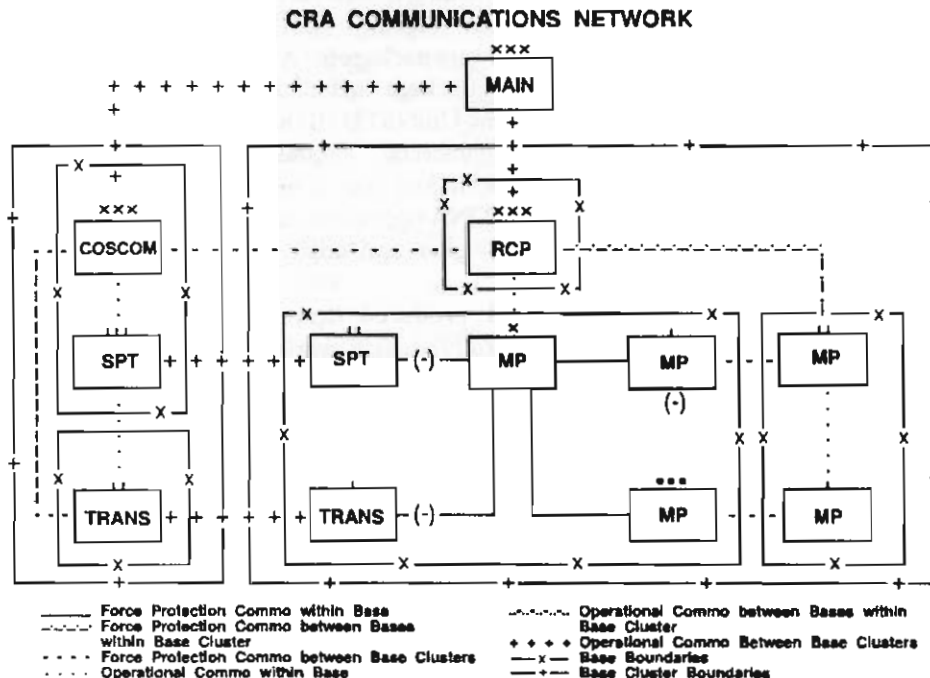


Figure 3. Example of CRA communications network.

the Army's maneuver control system (MCS), the more useful application of the program lies with stand-alone laptop computers at unit level. XVIII Airborne Corps requested the new equipment training (NET) team modify the POI to better suit Corps' requirements prior to the team's deployment to Saudi Arabia.

The NET team arrived during the transition from Desert Shield to Desert Storm deployments. Consequently, some units were unable to participate in the training and were simply provided with a copy of the program. The training focused on the basic functions of ANBACIS-I, creating chemical downwind messages (CDM), NBC 2 reports, and calculating NBC 3 reports. Figure 4 shows lessons learned.

ANBACIS I Lessons Learned

- Best used at battalion to division NBCE.
- MOPP analysis and smoke planning and operations files require immediate updating.
- Program lacks a radiological problem solving capability.
- Working data cannot be stored on a separate data disk.

Figure 4. ANBACIS I lessons learned.

SCUD Intercept Data

During fielding and training on ANBACIS-I, XVIII Airborne Corps received a SCUD intercept data package developed by the 907th Chemical Detachment (NBCE) (JB). This package, based on a Chemical School study, provided a method to predict chemical downwind hazards caused by a SCUD explosion at non-optimum heights of burst.

The procedure was derived from the nuclear fallout concept and the effective downwind message (EDM). Using all information available, XVIII Airborne Corps NBCC devised and implemented a simplified worksheet similar to the existing EDM worksheet.

SCUD Attack

Publication of the SCUD intercept worksheet was timely because the first SCUD attack against coalition forces in Saudi Arabia provided a field test. (See figure 5, below, for some of the lessons learned)

SCUD Intercept Procedures Lessons Learned

- Patriot firing unit must furnish exact intercept data (altitude, range, and direction).
- Shootdown data must be provided to the NBCC in a timely fashion.
- Time-of-fall data was independent of intermediate altitude wind data.
- The SCUD warhead was assumed to disperse chemical agent at non-optimum height of burst.
- Some SCUD warheads impacted on the ground fully intact following interception.
- Procedures did not apply to high altitude intercepts.

Figure 5. SCUD intercept procedures lessons learned.

ANBACIS-II

As the Corps NBCC continued to sharpen its skills in the midst of the Iraqi SCUD campaign in January 1991, more warning and reporting help arrived. A fielding team from the Defense Nuclear Agency (DNA) delivered a hardware package for ANBACIS-II. This package included a Secure Telephone Unit (STU III) and a secure commercial facsimile machine which linked the Corps NBCC with the DNA operations center as well as higher and adjacent headquarters.

ANBACIS-II produced detailed downwind hazard prediction overlays for expected chemical and biological contamination. These overlays or footprints depicted three levels of contamination: Median Lethal Contamination (LCt50), Median Incapacitating Contamination (ICt50), and Minimal Incapacitating Contamination (ICt5). Figure 8, opposite page, shows an example of a footprint.

ATP 45 Compatibility

ANBACIS-II was designed to com-

plement Allied Training Program (ATP) 45 while providing commanders greater decisionmaking flexibility. XVIII Airborne Corps quickly integrated ANBACIS-II into the Corps-wide NBCWRS. Numerous hypothetical chemical and biological attack situations were sent to DNA. These situations included different types of suspected enemy CW/BW agents, delivery means, temperatures, and wind speeds. ANBACIS-II provided the Corps with over 100 overlays during the early stages of the Desert Storm air campaign. These overlays were disseminated to Corps MSC with application instructions. The Corps continues to explore ANBACIS-II applications. Figure 6 shows key lessons learned.

ANBACIS II Lessons Learned

- ANBACIS II footprints are generally smaller than ATP 45 predictions.
- Attack patterns during high wind (unstable conditions) are smaller than those at low windspeeds (stable conditions).
- STU III telephone requires an analog/priority line.
- DNA could respond with a footprint within 15 minutes.

Figure 6. ANBACIS II lessons learned.

System Integration

Throughout the Desert Storm air and ground campaigns, XVIII Airborne Corps NBCC remained in constant touch with DNA as with all units in the Corps, VII (US) Corps, and ARCENT.

Figure 7 (next page) illustrates the integration that existed between NBCWRS, ANBACIS, and the employment of theater-level CW/BW sampling teams. The chart reflects tasks requiring coordination at the Corps NBCC following receipt of an NBC 1 or 3 report.

Conclusion

While Iraq did not use chemical or biological agents against coalition forces, XVIII Airborne Corps soldiers and units were prepared to survive,

NBWRS FLOWCHART

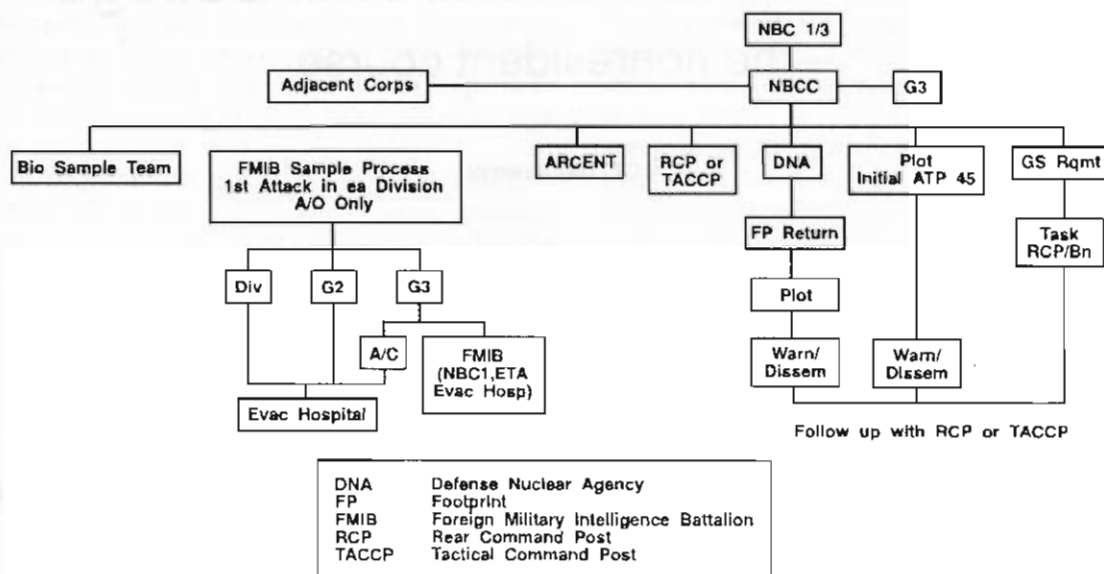


Figure 7. System integration flowchart.

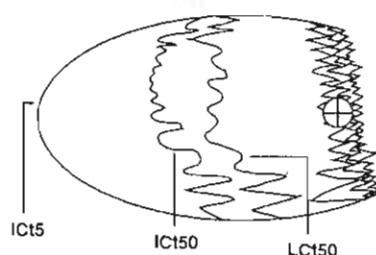
fight, and win under NBC conditions. The NBCTWS, NBCWRS, ANBACIS, and SCUD intercept prediction systems were integral parts of Corps operations and our NBC defense strategy. Use of these systems provided commanders with needed decisionmaking information in a time-

ly fashion.

While much remains to be done toward developing a truly integrated system, the first steps have been taken. As the Chemical Corps participates in the build-down of the Army, greater reliance must be placed on technology. Exploiting and integrating all

available technology must become a mission area imperative. Similarly, we must place greater emphasis on solutions that save personnel spaces as the

NBC2 (Chem)
 A. Z031C007C
 D. 230300ZXXXXX
 E.
 F1. 222222N333333E
 G. CAN
 H. SURFACE GB
 I.
 Y. 270 DEG, 015 KMPH



ANBACIS II

Remarks/Assumptions: Z031C007C
 Weapons System: 155mm (162 munitions)
 Agent: GB
 Windspeed: 13kmph
 HOB: .5m
 Temp: 7C
 Exposure Area
 LCt50 = 0.9km
 ICt50 = 1.3km
 ICt5 = 1.9km

Footprint Hazard Identification

- LCt50 is the innermost pattern and is the vapor dosage lethal to 50 percent of exposed unprotected personnel.
- ICt50 is the module pattern and represents the amount of inhaled vapor sufficient to disable 50 percent of exposed unprotected personnel.
- ICt5 is the outermost pattern and is the amount of inhaled vapor sufficient to disable 5 percent of exposed unprotected personnel.

Chemical strike patterns = eight hours after the attack (H + 8).

Scale: 1:50,00
 DNA Ref No. 0000-0000-0

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Figure 8. Example of a footprint.