GROUND-FORCE PERFORMANCE IN CHEMICAL PROTECTIVE POSTURE IN A BATTALION-SIZE FIELD EXERCISE CONDUCTED IN TEMPERATE WEATHER

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Numerous military organizations have conducted field exercises to assess the effects of antichemical protective posture on military performance. Considering the many variables of test design, equipment, prior training, command, troop morale, weather, measurement methods and possible reporting bias, it is not surprising that the reported findings cover a wide range -- from only minor effects to very major ones.

The following is a summary of the results of a particularly large US Army field exercise designed to assess the effects of antichemical protective posture on the performance of sustained ground operations by a battalion-size combined arms force in temperate weather. All data and other information relating to the exercise are from the unclassified report, Combined Arms in a Nuclear and Chemical Environment. Phase IIB (Battalion Level) and its unclassified appendices. TEXCOM Combined Arms Test Center, Fort Hood, TX. October, 1988. 1032 pp.

The exercise was conducted on a 15 X 22 km test site at the US Army Combined Arms Test Center, Fort Hood, Texas. The site includes woods, stream beds, open areas, and rolling hills. The weather was cool to warm (maximum temperature approximately 29 °C, 84 °F).

The exercise consisted of four 96-hour scenarios, with 2-3 days between scenarios for maintenance. Each scenario consisted of ten force-on-force engagements between opposing combined arms forces, generating a total of 40 separate engagements. The first and fourth scenarios were conducted with no chemical threat. The second and third scenarios included operations involving both persistent and non-persistent simulated chemical agent. One combined arms force (CAF) was designated the "blue" force for the first two scenarios and the other CAF was "blue" for the second two scenarios. In each scenario, the "blue" force defended and the opposing force attacked during the first and third 24-hour periods. During the second and fourth 24-hour periods "blue" attacked and the opposing force defended. Only the "blue" force was subject to chemical attacks in the two chemical scenarios, simulating one-sided use of chemical weapons.

Both CAFs consisted of four tank-heavy maneuver companies with normal organic support units (scout, medical, supply, mortar, maintenance, communications), plus a 155-mm artillery battery, engineer platoon, air defence artillery section, air defence artillery section, decontamination platoon, smoke squad, ground surveillance radar section, and forward support battalion. The exercises were supervised and evaluated by a group of approximately 50 control personnel and 187 evaluators.

The units were given no special training in anti-chemical defence beyond that in standard US Army training programs and skill qualification tests. Of 1322 participants surveyed, 91% had never participated in a chemical course; 73% had trained with their units in MOPP 4 no more than 5 hours per month; and 69% of the combat vehicle drivers in the survey said they had not previously driven in MOPP 4.

The US Army has five standard levels of individual soldier protectedness that commanders may designate, depending on the chemical/radiological threat, the temperature, and the mission. The five levels, called MOPP (mission-oriented protective posture), are:

MOPP 0: Ordinary battle dress uniform. Mask and hood carried but not worn.

MOPP 1: As above, plus chemical protective jacket and trousers worn. (In hot weather, jacket may be left open and the chemical protective garments may be worn directly over underwear, omitting the battle dress uniform)

MOPP 2: As above, plus protective overboots worn.

MOPP 3: As above, except mask and hood worn.

MOPP 4: As above, except jacket is closed and protective gloves worn.

Operations in the two chemical scenarios commenced with the "blue" force in MOPP 2. During the engagement, the commander of the "blue" force ordered various MOPP levels, depending on conditions. Upon notification that a chemical attack was imminent or had actually commenced, personnel were ordered into MOPP 4. Operations then continued in MOPP 4 for up to 6-8 hours during each 24-hour period of sustained operations. In addition, major operations initiated by the "blue" force were also conducted in MOPP 4, with 0-6 hours in MOPP 4 prior to initiation.

The test design specified that tank hatches be ordered closed during all daytime operations in MOPP 4. Although the order could not be fully enforced, owing to the preference of tank commanders to have the superior visibility of open hatches, hatches were often closed when MOPP 4 obtained. Therefore, some effects that appear to be associated with MOPP 4 may have resulted from the lowering of visibility caused by closed hatches and not from MOPP 4. An excerpt from the after-action report of the Brigade Commander regarding the separate effects of MOPP 4 and of closed hatches is given below.

Data was collected by various instruments and by evaluators attached to the "blue" force. Each evaluator was drawn from the same type of unit whose performance he was assigned to evaluate. Evaluators scored the observed performance of units as adequate, borderline, or inadequate. In the tables below, the quantity "%Adequate" is calculated as:

$$100 \times \text{adequate} \div [\text{adequate} + \text{borderline} + \text{inadequate}]$$

The following tabulated data are selected from a much larger body of data for their applicability to overall CAF mission performance, as opposed to performance of various sub-units in particular sub-missions. Therefor, evaluator scores, performance times and direct-fire vehicle kills at battalion and maneuver-company level are presented, while results for platoons and particular sub-units such as howitzer section and mortar section are not presented. In other words, emphasis is placed at the higher levels of aggregation, the levels more directly related to the outcome of battle.

RESULTS OF TANK, IFV AND ATGM ROUNDS FIRED AT COMBAT VEHICLES

	BLUE FORCE FIRING		OPPOSING FORCE FIRING	
scenarios	non-chemical	chemical	non-chemical	chemical
avg kills per engagement	11.8	15.1	11.6	10.4
avg rounds fired per engagement	440	473	303	351
kills per 100 rounds	2.7	3.2	3.8	3.0
number of engagements scored	19	19	19	19

TIME REQUIRED FOR BLUE TO CONDUCT OFFENSIVE OPERATION

Unit	MOPP	Number of engagements	Avg time (min)
Co/team	0	8	51
Co/team	4	8	48
Bn	0	8	52
Bn	4	8	51

TIME REQUIRED FOR BLUE TO CONDUCT HASTY ATTACK

Unit	MOPP	Number of engagements	Avg time (min)
Co/team	0	7	31
Co/team	4	9	19
Bn	0	3	52
Bn	4	3	51

OVERALL PERFORMANCE OF BLUE IN OFFENSIVE OPERATION

Unit	MOPP	Number of evaluations	%Adequate
Co	0	1237	92
Co	0-2	384	95
Co	3-4	1037	95
Bn	0	94	97
Bn	3-4	85	95

TIME REQUIRED FOR BLUE TO CONDUCT DEFENSIVE OPERATION

Unit	MOPP	Number of engagements	Avg time (min)
Co	0	12	32
Co	4	12	40
Bn	0	12	33
Bn	2	5	35
Bn	4	7	39

OVERALL PERFORMANCE OF BLUE IN REORGANIZATION AND CONSOLIDATION

AFTER ATTACK

Unit	MOPP	Number of evaluations	%Adequate
Co	0	510	95
Co	0-2	250	97
Co	3-4	404	98
Bn	0	31	100
Bn	3-4	23	100

AFTER DEFENCE

Co	0	332	99
Co	0-2	172	87
Co	3-4	161	97
Bn	0	36	100
Bn	0-2	19	100
Bn	3-4	11	100

OVERALL PERFORMANCE OF BLUE IN DEFENSIVE OPERATIONS

Unit	MOPP	Number of evaluations	%Adequate
Co	0	820	97
Co	0-2	338	89
Co	3-4	551	93
Bn	0	140	98
Bn	0-2	45	100
Bn	3-4	114	100

PERFORMANCE OF TACTICAL MOVEMENTS BY BLUE UNITS
(not including defensive and attack operations)

MOPP	Number of evaluations	%Adequate
0	825	93
0-2	319	85
3-4	369	81

EXCERPT FROM AFTER-ACTION REPORT OF BRIGADE COMMANDER

"In general, however, two observations are the most important. First, the units very quickly discovered that they could operate in mild weather quite well in MOPP IV and second, that the MOPP IV did not degrade their operation nearly as much as closed hatches."

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THE ROLE OF CHEMICAL DEFENSE IN CHEMICAL WARFARE, CHEMICAL DETERRENCE, AND CHEMICAL DISARMAMENT

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