

CHAPTER 6

Smoke**Smoke in the Offense**

Battlefield applications of smoke include—

- Obscuring
- Screening
- Protecting
- Marking

Friendly forces use projected, generated, and self-defense smoke to-

- Mark targets.
- Obscure enemy gunners and surveillance.
- Degrade enemy command, control, and communications.
- Conceal passage of lines, movement to contact, and hasty and deliberate attacks.
- Conceal landing zones (LZs), drop zones (DZs), or pickup zones (PZs). (For friendly LZs, DZs, and PZs the smoke is placed to restrict enemy observation without interfering with friendly operations.)
- Conceal river-crossing operations and reduction of obstacles.
- Conceal logistics operations (for example, fast refuel sites).
- Signal.
- Support deception plans.
- Degrade enemy laser designators, range finders, and weapons.
- Enhance the effectiveness of artillery-delivered minefield by concealing their visual indicators.
- Support MOUT operations.

Smoke in the Defense

In the defense, forces use smoke primarily to increase survivability and counter enemy reconnaissance, surveillance, and target acquisition. Forces use smoke in the defense to—

- Obscure enemy direct-fire gunners and artillery forward observers.
- Disrupt enemy movement and command and control.
- Conceal obstacle emplacement, preparation of battle positions, and movement to alternate positions.
- Conceal reconstitution, holding, and staging areas.
- Conceal MSR activities.
- Signal.
- Mark targets.
- Deceive the enemy as to areas of main effort and battle positions.
- Reduce the effectiveness of enemy directed-energy weapons.

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- Enhance air defense by degrading nap-of-earth flight patterns and forcing the enemy to fly higher.
- Silhouette targets.
- Support MOUT operations.

Tactical Countermeasures

- Disperse laterally and in-depth to increase lines-of-sight.
 - Position forward observers outside anticipated coverage.
 - Position laser designators to front or flanks to avoid preplanned smoke.
 - Position visual air defense systems on high ground.
 - Position thermal/MMW air defense systems in smoke.
- Use obstacles to disrupt enemy timing.
 - Use electronic jamming to preclude adjustments of smoke.
 - Use remote sensor systems to track enemy progress.
 - Engage at choke points with indirect or preaimed direct fire.
- Deceive the enemy about unit location.
 - Prepare positions and alternates in friendly smoke.
 - Conduct rigorous counter-reconnaissance.
 - Use decoys.
- Use helicopters to identify and fire through gaps in coverage. Use remote piloted vehicle (RPV) to look down through smoke.
- Employ scatterable mines in friendly or enemy smoke to slow an attacking enemy.
- When moving in smoke, plan for tighter formations, slower speeds, and easily recognized routes.
- In the defense, prepare and rehearse movement to alternate and subsequent positions. Use range cards, T&E mechanisms, and multiple lines-of-sight for paired weapons. Plan for target hands-off.

Smoke coordination and reconnaissance checklists for smoke unit leaders are outlined on Page 6-5.

Smoke Planning Process

- Each echelon of command plans for smoke employment to support current and future operations.
- Integrate smoke into the overall tactical plan.
- Synchronize smoke use with key events or decision points.
- Base smoke planning on the same factors as the tactical plan—
 - Mission
 - Enemy situation

- Terrain
- Weather
- Troops available
- Time
- Distance
- Mission considerations include—
 - Types of smokes and obscurants available.
 - Unit capabilities.
 - Detailed planning and preparation.
 - Employment techniques.
 - Communications.
 - Intelligence.
 - Whether the unit has successfully operated in smoke previously
- Chemical staffs must coordinate with other staff sections to—
 - Develop estimates that define enemy capabilities and our own courses of action.
 - Analyze smoke targets.
 - Prioritize smoke resources.
 - Recommend courses of action to the commander.
- When the commander approves the staff estimates, the staff prepares orders that combine smoke with combat power.

Situation and Target Development

Targeting begins with the commander's guidance and continues through the development of a prioritized list specifying what targets to attack and when to attack these targets (DECIDE), plus acquiring high-payoff targets (DETECT), and what will defeat these targets (DELIVER).

Intelligence Preparation of the Battlefield

- For smoke planners
 - Evaluation of area of interest and operation.
 - Terrain analysis
 - Weather analysis
 - Threat evaluation
 - Threat integration

Smoke Estimate

- Chemical officer, in coordination with the G3/S3, FSO, and smoke unit commander/platoon leader prepares the smoke estimate.
- Estimate goes to the S2 and targeting officer for inclusion into the target value analysis (TVA) for fire support planning, and to the S3 and chemical staff for smoke

target planning.

Smoke Support Plan Development

- Prepared simultaneously with the smoke estimate.
- Obtain the restated mission/commander's intent.
- Obtain required fire and smoke planning information.
- Recommend smoke support coordinating measures.
- Update status displays.
- Brief smoke support plan to obtain concurrence from commander (or G3/S3 as required by local policy).
- Coordinate fire support plan changes with the commander or S3 and with the FSO.
- Coordinate the smoke support plan with adjacent units.
- Brief smoke unit leader(s) on the smoke annex to the OPORD.

Smoke Support Plan Execution

- Use covered and concealed maneuver techniques.
- Time smoke delivery with decision points, IPB, and human feedback.
- Use unobscured weapons to overwatch.
- Do not let your smoke silhouette your own forces.
- Plan to engage through or around the smoke.
- Plan for enemy countermeasures.
- Plan for additional maneuver time under smoke.
- Verify enemy locations (responsibility of recon).

Smoke Support Plan Execution

The impact of smoke on tactical operations mandates close coordination, control, and planning for contingencies.

- Command/staff supervision are essential to ensure the use of smoke enhances rather than degrades mission success.
- Commanders must control smoke in their areas of operation.
- Smoke unit leader monitors the communications nets for the supported unit and internal nets.

- Plan to minimize friendly force degradation from our use of smoke.

Smoke Mission Coordination Checklist for Smoke Unit Commanders or Leaders

- Grid coordinates of the smoke target area.
- Tactical or operational missions to be supported.
- Visibility criteria required in the smoke target area?
- Type of screening smoke (haze, blanket, or curtain).
- Type of smoke unit support for logistics, security, and fire support available or needed.
- Will weather and terrain influence the mission?
- Anticipated duration of the mission.
- Direction of known or suspected enemy forces.
- Supported units' frequencies, call signs, and brevity codes.
- Signals for starting, stopping, shifting, or continuing the smoke mission.
- Tactical situation in the proposed smoke area of operations concerning enemy contact, obstacles, etcetera.
- Actions taken should the smoke unit make enemy contact.
- Grid coordinates of supported unit TOCs/CPs.
- Challenge/password and code weds.
- Fog oil and fuel (both diesel and gasoline) resupply.
- Maintenance support and recovery provided.
- Projected requirement for Class V.
- What aviation assets will be available to supported and supporting units?
- Where are LZs, and FARPs?

Smoke Recon Checklist for Smoke Unit Leaders

- Locate selected target areas.
- Determine supported and subordinate unit positions.
- Designate subordinate unit smoke positions and/or lanes.
- Locate smoke control point(s).
- Designate supply routes, access routes, fuel resupply points, and/or fuel/fog oil

forward prestock points if required.

- Determine local weather and terrain conditions. (While it is important to note local weather conditions at the time of the recon, the unpredictable nature of weather necessitates that the smoke unit leader consider all possibilities when drafting the operations order.)
- Determine security support requirements and internal smoke unit defense measures.

Table 6-1. Smoke Generator Unit Capabilities

Type of Organization	Point Sources	Average Screen Width* Visibility at 50 Meters (Min-Max)	Average Screen Width* Visibility at 50—Meters (Min-Max)
Chemical Company (SG) (Mtr) (M151) M3A4 One Platoon	48 24	1.00 km—3.4 km 0.50 km—1.7 km	2.0 km—6.8 km 1.0 km—3.4 km
Chemical Company (SG) (Mtr) M998) (M3A4) One Platoon	48 24	0.50 km—1.7 km 0.50 km—1.7 km	1.0 km—3.4 km 0.1 km—3.4 km
Chemical Company (SG) (Mtr) M1037) (M157) One Platoon	24 12	0.50 km—1.7 km 0.25 km—.85 km	1.0 km—3.4 km 0.5 km—1.7 km
Chemical Company (Smk/Decon) (M151) M3A4) One Platoon	48 12	1.00 km—3.4 km 0.30 km—.9 km	2.0 km—6.8 km 0.5 km—1.7 km
Chemical Company (Hvy Div/Mech) Smoke Platoon (M1059) (M157)	6	0.20 km—.6 km	0.4 km—1.1 km
Chemical Company (SG) Mech (M1059) (M157) One Platoon	21 7	0.60 km—2 km 0.30 km—.7 km	1.1 km—3.7 km 0.5 km—1.3 km

* Average screen widths are estimates for stationary smoke employment only but may be used as minimums for mobile employment.

Table 6-2. Wind Speed Estimation.

Observed Conditions	Wind Speed	
	Kmph	MPH
Smoke, vapor from breath, or dust raised by vehicles or personnel rises vertically. No leaf movement.	0-2	0-1
Smoke, vapor from breath, or dust raised by vehicles or personnel moves slightly in direction of wind. Leaves move slightly and intermittently.	3-5	1-3
You can feel slight wind on your face. Leaves rustle.	6-10	4-7
Leaves and small twigs in constant motion.	11-14	7-12
Wind raises dust from ground. Loose paper and small branches move.	15-25	13-18
Small trees with leaves sway. Coastal wavelets form on inland waters.	26-32	19-24

Table 6-3. MOGAS Consumption (number of gallons).

Generators	Mission (Hours)							
	1	2	3	4	6	8	10	12
1	3	6	9	12	18	24	30	36
2	6	12	18	24	36	48	60	72
3	9	18	27	36	54	72	90	108
4	12	24	36	48	72	96	120	144
6	18	36	54	72	108	144	180	216
8	24	48	72	96	144	192	240	288
10	30	60	90	120	180	240	300	360
12	36	72	108	144	216	288	360	432
14	42	84	126	168	252	336	420	504
18	54	108	162	216	324	432	540	648
24	72	144	216	288	432	576	720	864
36	108	216	324	432	648	864	1,080	1,296
48	144	288	432	576	864	1,152	1,440	1,728
Formula	Gallons of MOGAS = mission duration (hours) times number of generators times 3 gallons/hour.							

**Table 6-4. Fog Oil Consumption (Number of 55-gallon drums)
(For general planning M3A4 EM157)**

Generators	Mission (Hours)							
	1	2	3	4	6	8	10	12
1	1	2	3	4	6	8	10	12
2	2	4	6	8	12	16	20	24
3	3	6	9	12	18	24	30	36
4	4	8	12	16	24	32	40	48
6	6	12	18	24	36	42	60	72
8	8	18	24	32	48	64	80	96
10	10	20	30	40	60	80	100	120
12	12	24	36	48	72 ⁿ	96	120	144
14	14	28	42	56	84	112	140	168
18	18	36	54	72	108	144	180	216
24	24	48	72	96	144	192	240	288
36	36	72	108	144	216	288	360	432
48	48	96	144	192	208	384	480	576

Table 6-5. Smoke Pot Characteristics.

Type of Smoke Pot	Burning Time (Minutes)	Ignition	Chain Ignition	Floating	Weight (Pounds)	Fuel Filler
M5	12-22	Manual or electrical	Yes	No	33	HC (solid)
M4A2	10-15	Manual	No	Yes	38	HC (solid)
XM8 (Training only)	5-7	Manual	No	No	33	TA (solid)

Table 6-6. Smoke Pot Placing Guide.

Wind Speed		Temperature Gradient	Terrain Description	Position Spacing (meters)		Distance Smoke Line from Target (Meters)
Kmph	Mph			Haze	Blanket	
1-14	1-9	All: Stable Unstable or Neutral	Open/Water	50	25	250
			Wooded	60	30	300
				70	35	350
25-15	9-16	All	Open/Water	40	20	200
			Wooded	50	25	250
26-32	16-20	All	Open/Water	30	15	150
			Wooded	40	20	200
Formula		Number of pots/points required = $\frac{\text{Duration of Mission (min)}}{\text{Burn Time of Pot (min)}}$				

CLASSIFICATION

1. Grid coordinates of the smoke mission (target location): _____
2. Start and stop date/time/event of smoke mission:
 START Date/Time/Event: _____
 STOP Date/Time/Event: _____
3. On/off-station date/time for the smoke unit(s):
 ON-STATION date/time: _____
 OFF-STATION date/time: _____
4. Type of visibility in the smoke required: _____
 (Blanket: less than 50 meters.) (Haze: 50 to 150 meters.)
5. Enemy location(s)/activity: _____
6. Communications:
 - (a) Supported unit's frequencies and callsign:
 Primary Frequency: _____ Alternate: _____
 Callsign: _____
 - (b) Supporting unit's frequencies and callsigns:
 Primary Frequency: _____ Alternate: _____
 Callsign: _____

CLASSIFICATION

Figure 6-1. Sample smoke mission coordination checklist.

CLASSIFICATION

7. Supporting unit's command relationship to the supported unit (DS, GS, attached, OPCON): _____

8. Supported units' responsibilities to the supporting unit (for example, maintenance, transportation, fuel, and feeding): _____

9. Required staff coordination for the mission: (Check applicable staff sections.):
 S2 ___ S3 ___ S4 ___ FSE ___ ALO ___ ENG ___

10. Location of supported unit's TOC: _____

11. Challenge, password(s), and code word(s): _____

12. Coordination effected with subordinate units, DATE/TIME: _____

13. Coordination effected with adjacent units, DATE/TIME: _____

14. Designate supply route(s) in/out of area: _____

15. Determine local weather conditions and peculiarities: _____

16. Determine any additional security requirement (for example, supporting unit requirement(s) for security forces): _____

17. Liaison Information (between supported unit and supporting unit):

18. Smoke operation overlay: _____

19. After action report (AAR) to division NBCC: _____
 Date/Time Mission Started: _____
 Duration of Mission: _____
 Fog Oil/MOGAS Consumption: _____
 Mission Issues/Problems: _____
 Mission Results (success or failure): _____

CLASSIFICATION

Figure 6-1 (cont'd). Sample smoke mission coordination checklist