



Fire Management
Pocket Guide

INCIDENT RESPONSE &
FIRELINE SAFETY

Version 1.1 October 2005



CapeNature



REPORT ON CONDITIONS

- Incident name
- Incident commander
- Incident type
- Wildfire, search and rescue, etc.
- Incident status
- Location
- Jurisdiction
- Radio frequencies
- Incident size
- Fuel type
- Wind speed and direction
- Slope and aspect
- Best access
- Special hazards or concerns
- Additional resource needs

INCIDENT RESPONSE & FIRELINE SAFETY POCKET GUIDE

Sponsored by
**South African National Lottery Development
Trust Fund**

Prepared by
**Fire Management Group
Fire Programme
CapeNature**

Version 1.1 October 2005



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FAST CHECK

Size-up: As you respond and when you first arrive at the scene of an emergency, you should do a full size-up of the situation. Only then are you ready to develop your plan of action.

Fire history: What have fires in this area done before?

Weather conditions: Temperature, humidity, wind speed and direction should be recorded. Analyze this information to detect if a change is taking place. Ask for an up-to-date forecast.

Fuels: Heavy/light, loading, arrangement, etc..

Topography: Kloofs, ridges, man-made or natural barriers.

Fire behavior: Spotting, crowning and rate of spread.

Number of structures being threatened: Density, roofing, siding, clearance and LPG tanks.

Access: Narrow roads, mid-slope roads, dead ends, bridges and clearances.

Water sources: Dams, rivers, hydrants and swimming pools.

Evacuations: Will you have to evacuate people and animals? If the residents are going to stay, turn them into an asset.

Special hazards: Hazardous materials, explosives, high-voltage lines and above-ground fuel storage tanks.

FIRE WEATHER

The weather is used to detect changes that may impact fire behavior. At a minimum, the following weather factors should be recorded every hour:

- temperature
- relative humidity
- wind speed and direction.

Stability: Unstable air will intensify fire behavior. Some of the indicators of unstable air are:

- clouds growing vertically to great heights
- upward and downward currents causing gusty surface winds
- good visibility
- smoke column rising to great heights
- dust devils and/or firewhirls observed.

Smoke column: Reading the smoke column can tell you a lot about the fire behavior:

- *Leaning Smoke Column:* A wind driven fire; rapid rates of spread; short range spotting.
- *Sheared Smoke Column:* Smoke rises straight up; column is sheared off by strong winds aloft: potential for long range spotting; strong winds could surface.
- *Well-Developed Smoke Column:* Intense burn-

ing conditions; unpredictable fire spread in all directions; look for capped top; strong downburst potential; light rain indicates possible downbursts imminent.

- *Changing Smoke Column*: Beware when the column begins to change color or rotate; this means the fire is heating up.

FLAME LENGTH

Less than 1m: Fires can generally be attacked at the head or flanks by firefighters using handtools. Handline should hold fire.

1 to 2m: Fires are too intense for direct attack on the head with handtools. Handline cannot be relied upon to hold the fire. Bulldozers, engines, and retardant drops can be effective.

3 to 4m: Fires may present serious control problems: torching, crowning, and spotting. Control efforts at the head will probably be ineffective.

Over 4m: Crowning, spotting and major fire runs are probable. Control efforts at the head of the fire are ineffective.

RECONNAISSANCE: PLAN THE FLIGHT

Pre-flight briefing:

- discuss flight plan, check smoke, sun and flight hazards
- check air to ground comms
- test on-board comms
- select best seating
- take map, pens, digital camera etc..

In-flight:

- identify landmarks, access routes, water sources, control lines, drop zones, flying hazards
- observe current and potential fire behaviour, vegetation and topography
- trace perimeter and rate of spread of fire on map.

TROOPING

- Brief pilot on drop zones.
- Appoint emplaning, deplaning officers.
- Test air-to-ground comms.
- Safety briefing for fire-fighters:
 1. Only approach, leave on pilot signal
 2. Stay In front of aircraft
 3. Crouch on approach, tools horizontal
 4. Fasten gear, ruck sacks to front
 5. Don't throw tools
 6. Don't run
- Form groups, as per pilot instruction.

Emplaning:

1. Form rows, up wind of LZ
2. Row move forward on signal
3. Climb aboard one-at-a-time
4. Fasten seat belts

Deplaning:

1. Guide pilot to drop zone
2. Assist fire- fighters out
3. Indicate safe exit route
4. Refasten seat belts

MINIMUM IMPACT SUPPRESSION TACTICS

The intent of minimum impact suppression tactics is to suppress a wildfire, with the least impact to the environment. Fire conditions and good judgment dictate the actions taken. Consider what is necessary to halt fire spread and contain it within the fireline or designated perimeter boundary.

Safety

- Safety is of utmost importance.
- Constantly review and apply the 'Watch-out Situations' and 'Firefighting Orders'.
- Be particularly cautious with:
 - unburned heavy fuel between you and the fire
 - fireline down hill towards fire head
 - unburnt area where terrain is difficult and slow
 - area and local factors influencing fire behaviour unfamiliar to fire fighters

- entering unknown terrain under cover of darkness
- frontal assault with fire tankers
- frequent spots
- rolling material
- change in wind speed and direction
- burning snags allowed to burn
- partially burnt area for possible reburn.

Fire suppression

- Select procedures, tools, equipment that least impact the environment.
- In light to medium fynbos, fuels swatting with a beater remains an effective means of fire suppression.
- Consider using water as a firelining tactic (fireline constructed with nozzle pressure, helicopter bucketing - wetlining).
- Allowing fire to burn to natural barrier.
- Minimise the use of bulldozers.
- Avoid the construction of tracer belts on steep gradients.
- Avoid driving in vehicles tracks through the fynbos.

COMMUNICATION RESPONSIBILITIES

All firefighters have five communication responsibilities:

- brief others as needed
- debrief your actions
- communicate hazards to others
- acknowledge messages
- ask if you don't know.

In addition, all leaders of firefighters have the responsibility to provide complete briefings that include a clearly stated 'Leaders Intent'.

Task = What is to be done

Purpose = Why it is to be done

End state = How it should look when done

Compose messages in accordance with the prescribed principles:

'C R A C K'

Current

Relevant

Accurate

Concise

Clear

MEDIA INTERVIEWS

Prepare: Know the facts. Develop 2-3 key messages and deliver them. Prepare responses to potential tough questions. If possible, talk to reporter beforehand to get an idea of subjects, direction and slant of the interview.

Be concise: Give 10-20 second, simple answers and when you're done, be quiet. If you botch the answer, simply ask to start again.

Be honest: Personable, professional, presentable (remove sunglasses and hats).

Look at the reporter, not the camera.

Do not speculate on the origin of the fire unless you have verification of the information received,

Never talk 'off the record', exaggerate, or try to be cute or funny.

Don't guess or speculate or say 'no comment'. Either explain why you can't answer the question or offer to track down the answer.

Don't disagree with the reporter. Instead, tactfully and immediately clarify and correct the information.

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Don't speak for other agencies or offices, or use jargon or acronyms.

Remember to state the fire is being managed by CapeNature if we happen to be the major player, or indicate our secondary role if we are assisting. Tell the reporter exactly what the organisation does.

Be serious, don't try to be funny - your humour is not necessarily easily interpreted.

Always assume the microphone is on - don't make remarks that can be used later in a negative way.

Try not to sound defensive when replying to a question. Always be positive.

POST FIRE DEBRIEFING

Post fire debriefing agenda:

- Cause of fire, location and time.
- Reporting procedure - to whom by whom.
- Immediate reaction, by who in what time.
- Deployment, suppression and guarding of fire.
- Logistics.
- FAP - activation and procedure.
- Communication - personnel, media and public.
- Equipment and rations.
- Weather conditions - during fire, and accuracy of forecasts.
- Cooperation and support - contractors, district municipalities.
- Ecological implications of burn.
- Shortcomings and resolutions.
- Injuries and losses.
- Recommendations.

FIRE CAUSE DETERMINATION CHECKLIST

- Take essential investigation materials to the incident.
- Make notes of all your actions and findings including:
 - time fire was reported
 - name and identification of reporting party
 - en-route observations of people and vehicles
 - name and identification of persons or vehicles in vicinity of fire origin.
- Record the weather.
- Locate and protect fire origin.
- Search fire origin area for physical evidence of fire cause.
- Protect evidence - do not remove unless necessary to prevent destruction.
- Make sketches of origin area with measurements of relative locations of all evidence.
- Take photographs from all angles including long and medium distance, and close-up views of fire origin area and evidence.
- Turn over all notes, information and physical evidence to legal services and make your notes part of the official fire record.

HELICOPTER HAND SIGNALS



Clear to Start
Make circular motion
above head w/arm



Hold on Ground
Extend arms at 45
thumbs down



Move Upward
Arms extended
sweeping up



Move Downward
Arms extended
sweeping down



Hold Hover
Arms extended
w/clenched fists



Clear to Take-Off
Arms extended in
take-off direction



Land Here
Extend arms
w/wind at back



Move Forward
Arms extended &
wave copter toward you



Move Rearward
Arms downward
using shoving motion



Move Left
Right arm extended
left arm sweeps overhead



Move Right
Opposite of
move left



Move Tail Rotor
Rotate body w/one
arm extended



Shut Off Engine
Cross neck w/hand
palm down



Fixed Tank Doors
Open arms outward
Close arms inward



**Release
Sling Load**
Contact forearm
w/other hand



**Wave Off
Don't Land**
Wave arms &
cross overhead

PHONETIC ALPHABET

A	Alpha
B	Bravo
C	Charlie
D	Delta
E	Echo
F	Foxtrot
G	Golf
H	Hotel
I	India
J	Julliett
K	Kilo
L	Lima
M	Mike
N	November
O	Oscar
P	Papa
Q	Quebec
R	Romeo
S	Sierra
T	Tango
U	Uniform
V	Victor
W	Whiskey
X	X-Ray
Y	Yankee
Z	Zulu

FIRE PROTECTION OFFICER

Duties of a registered FPO:

- Perform role of the CEO of the FPA.
- Carry out tasks assigned to him or her by the FPA
- May take control of fire fighting for FPA's area if veldfire is a threat to life and property, and s/he is reasonably able to do so.

When a fire spreads across a boundary of a FPA, the FPO must:

- inform the FPO of that area
- co-ordinate fire fighting efforts with that FPA
- enforce rules of FPA
- monitor and report to minister on compliance with Act
- train FPA members on laws, rules of FPA, fighting and preventing veldfires
- inspect members' land to ensure they are complying with their duties under the Act and the rules of the FPA.

SURVIVAL CHECKLIST

The following 18 situations shout 'WATCH OUT!'

1. Fire not scouted and sized up.
2. In terrain not seen in daylight.
3. Safety zones and escape routes not identified.
4. Unfamiliarity with weather and local factors influencing fire behavior.
5. Uninformed on strategy, tactics and hazards.
6. Instructions and assignments not clear.
7. No communications link with crew members/supervisor.
8. Construction of fireline without safe anchor point.
9. Building fireline downhill with fire below.
10. Attempting frontal assault on fire.
11. Unburned fuel between you and the fire.
12. Cannot see main fire. Not in contact with anyone who can.
13. On hillside where rolling material can ignite fuel below.
14. Weather is getting hotter and drier.
15. Wind increases and/or changes direction.
16. Occurrence of frequent spot fires across line.
17. Terrain and fuels make escape to safety zones difficult.
18. Taking a nap near fireline.

TEN FIRE ORDERS

- Fight fire aggressively but provide for safety first.
- Initiate all actions based on current and expected fire behavior.
- Recognise current weather conditions and obtain forecasts.
- Ensure instructions are given and understood.
- Obtain current information on fire status.
- Remain in communication with crewmembers, supervisor and adjoining forces.
- Determine safety zones and escape routes.
- Establish lookouts in potentially hazardous situations.
- Retain control at all times.
- Stay alert, keep calm, think clearly, act decisively.

L. A. C. E. S.

As you begin to develop your operational plan, be sure that you have people and systems in place to deal with the unexpected.

LOOKOUTS - Place experienced and knowledgeable people at strategic sites where they can see the fire and where you will be working. These lookouts are your eyes and ears.

AWARENESS - Know what is happening around you. Look up, look down, look around!

COMMUNICATIONS - Can you communicate with your lookouts, crew, supervisor, etc.?

ESCAPE ROUTES - Do you have TWO escape routes? Does your team know where they are located?

SAFETY ZONES - Have you identified a safety zone(s) for your use? Does your team know of it? Do they know when to move into it for safe refuge?

FIRE SURVIVAL

Basic principles:

- Select an area where there is the least amount of combustible material.
- Use every means to protect yourself from radiation from the flames.
- Remain calm and don't panic.

In a vehicle:

- Don't drive a vehicle blindly through heavy smoke.
- Park in clear or burnt area and switch headlights on.
- Role up windows and shelter yourself from radiation beneath the dashboard and with a rug or similar item. (If the vehicle catches fire, leave it but keep your skin covered as much as possible).
- Remain calm and remember that the fuel tank won't explode and that even in the worst situation, it will be some minutes before the vehicle catches fire.

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- In forest/fynbos fire, the flames will last 3-4 minutes or longer and, although your chances for survival are lower, you are safer in a vehicle than in the open.

In the open:

- Don't panic.
- Protect against radiation.
- Take cover:
 - in a shallow trench, culvert or crevice
 - behind a large rock or log
 - in running streams or dams
 - under a vehicle.
- Enter the burnt area through the flames if this is the only escape route.
- Burn out as large an area as possible between you and the flames.
- Lie prone in a depression as a last resort.
- Don't run unless you see a clear avenue of escape (generally best to go downhill or towards the flank).
- Regulate breathing, cover mouth and nose with dampened handkerchief.

SPECIFIC FIRST AID TREATMENTS

BLEEDING - Direct pressure, elevate and pressure point.

SHOCK - Lay patient down, elevate feet, keep warm and replace fluids if conscious.

FRACTURES - Splint joints above and below injury and monitor pulse past injury, away from body.

BEE STING (ANAPHYLAXIS) - If life threatening, see if the patient has a sting kit and transport immediately.

BURNS - Remove heat source, cool with water, dry wrap and replace fluids.

DIARRHEA - Drink fluids in large quantities.

EYE INJURIES - Wash out foreign material, don't open swollen eyes, leave impaled objects, pad and bandage both eyes.

HEAT EXHAUSTION - Skin grey, cool and clammy. Rest in cool place and replace electrolytes.

HEAT STROKE - Skin dry, red, temperature hot. Cool and transport immediately. Treat for shock.

BURN INJURY TREATMENT

Remove person from heat source, extinguish with water.

Provide basic first aid:

- maintain airway, breathing, circulation (ABCs)
- treat for shock by keeping person warm, feet elevated
- provide oxygen if available and trained to administer. Assess degree of burn and area affected.

Redness, mild swelling, tenderness and mild to moderate pain:

Second degree - extends through entire outer layer and into inner layer of skin.

First degree - affects skin's outer layer.

Blisters, swelling, weeping of fluids and severe pain:

Third degree - extends through all skin layers and into underlying fat, muscle and bone. Discoloration (charred, white or cherry red), leathery, parchment-like, dry appearance. Pain is absent.

'Rule of Nine' for determining area burned:

Head 9% Front torso 18% Back torso 18% Left arm 9% Right arm 9% Left leg 9% Right leg 9% Perineum 1%

Cut away only burned clothing. DO NOT cut away clothing stuck to burned skin.

Apply cool, clear water over burned area. DO NOT soak person or use cold water and ice packs - this encourages hypothermia.

Cover burned area with sterile dressing, moisten with saline solution and apply dry dressing on top.

For severe burns or burns covering large area of body:

- wrap in clean, sterile sheet followed by plastic sheet
- place inside sleeping bag or cover with insulated blanket
- monitor ABCs and keep burn areas moist
 - avoid hypothermia and overheating.

CPR

DETERMINE RESPONSIVENESS - Gently shake shoulder and shout: "Are you OK?" If no response, call EMS. If alone, call EMS before starting ABCs.

AIRWAY - Roll victim on back as a unit, supporting head and neck. Open airway by head-tilt/chin-lift maneuver. Look, listen and feel for breathing for 3-5 seconds. If no response, go to B.

BREATHING - Pinch victim's nose shut. Put mouth over victim's, making a tight seal. Give two slow breaths. If chest does not rise, reposition and try again. If breaths still do not go through, use abdominal thrusts to clear airway. If chest does rise, go to C.

CIRCULATION - Check carotid pulse for 5-10 seconds. If there is a pulse but no breathing,

give one breath every 5 seconds until victim is breathing or help arrives. If no pulse, begin chest compressions.

ONE/TWO RESCUER CPR

- Perform 15 external chest compressions at the rate of 80-100 times per minute, to a 1.5-2 inch depth.
- Reopen airway and give two full breaths. After four cycles of 15:2 (about one minute), check pulse.
- If no pulse, continue 15:2 cycle, beginning with chest compressions until advanced life support is available.
- If two rescuers are available, use a 5:1 compression to breath ratio.
- Use a 5:1 ratio for children and infants, with compressions at a rate of 100 times per minute.
- Use a 1 - 1.5 inch depth for children and a 0.5-1 inch depth for infants.

AERIAL WATER DROPS

An oncoming load of bucketed water is moving at up to 100km/h and a direct hit from a low drop could be fatal. If a situation occurs where a crew-member is in danger of being hit by a load from a helicopter, he/she should remember the following:

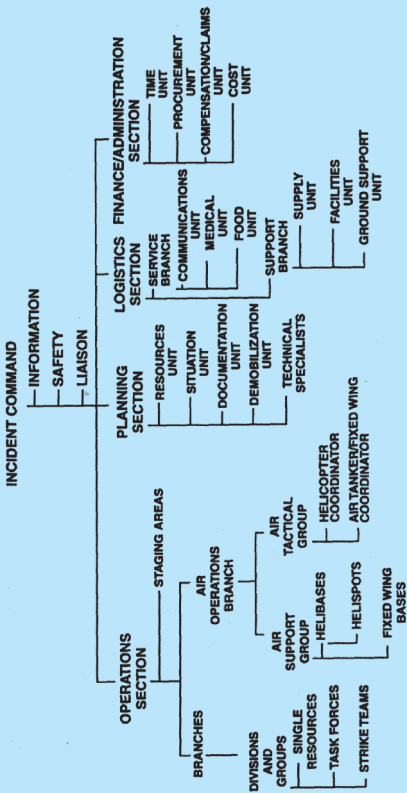
- As aircraft approaches, the crew should withdraw \pm 10 meters from the fire line if possible.
- Lie face down towards the oncoming helicopter with your hard-hat in place.
- Be aware of loose objects (branches/rolling rocks) that may be thrown by the falling load.
- Discard hand tools to the side.

ICS BASICS

Standard Functions of Command

1. Assume, confirm and position command
2. Situation evaluation
3. Initiate, maintain and control communications
4. Deploy appropriate resources
5. Identify strategy and develop IAP
6. Develop incident organization
7. Review and revise strategy and IAP
8. Transfer, continue, terminate command

ICS ORGANOGRAM



OPERATIONAL LEADERSHIP

The most essential element of successful wildland firefighting is competent and confident leadership. Leadership means providing purpose, direction and motivation for wildland firefighters working to accomplish difficult tasks under dangerous, stressful circumstances. In confusing and uncertain situations, a good operational leader will:

TAKE CHARGE of assigned resources.

MOTIVATE firefighters with a 'can do safely' attitude.

DEMONSTRATE INITIATIVE by taking action in the absence of orders.

COMMUNICATE by giving specific instructions and asking for feedback.

SUPERVISE at the scene of action.

THE INCIDENT COMMANDER'S DUTIES

The Incident Commander has a wide variety of duties:

- Establish an appropriate organization.
- Ensure planning meetings are scheduled as required.
- Approve and authorize the implementation of an Incident Action Plan.
- Ensure that adequate safety measures are in place.
- Coordinate activity for all Command and General Staff.
- Coordinate with key people and officials.
- Approve requests for additional resources or for the release of resources.
- Keep agency administrator informed of incident status.
- Approve the use of students, volunteers, and auxiliary personnel.
- Authorize release of information to the news media.

INITIAL UNIFIED COMMAND MEETING

All of the jurisdictional agency's Incident Commanders need to get together before the first operational period planning meeting in an Initial Unified Command Meeting. This meeting provides the responsible agency officials with an opportunity to discuss and concur on important issues prior to joint incident action planning. The agenda for the command meeting should include the following:

- a. State jurisdictional/agency priorities and objectives.
- b. Present jurisdictional limitations, concerns and restrictions.
- c. Development of a collective set of incident objectives.

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- d. Establishment and agreement on acceptable priorities.
- e. Adoption of an overall strategy or strategies to accomplish objectives.
- f. Agreement on the basic organisation structure.
- g. Designation of the most qualified and acceptable Operations Section Chief. The Operations Section Chief will normally be from the jurisdiction or agency that has the greatest involvement in the incident, although this is not essential.
- h. Agreement on general staff personnel designations and planning, logistical and finance agreements, and procedures.
- i. Agreement on the resource ordering process to be followed.
- j. Agreement on cost-sharing procedures.
- k. Agreement on informational matters.
- l. Designation of one agency official to act as the Unified Command spokesperson.

PLANNING MEETING ACTIVITY CHECKLIST

No.	Activity	Primary responsibility
1	Give situation and resources briefing	Planning Section Chief
2	State incident objectives and policy issues	Incident Commander
3	State primary and alternative strategies	Operations Section Chief
4	Designate branch, division, group Operations Section Chief boundaries and functions as appropriate	Operations Section Chief
5	Describe tactical operations and tactics	Operations Section Chief

No.	Activity	Primary responsibility
6	Make tactical resource assignments	Operations, with support of Planning and Logistics Section Chiefs
7	Determine operations facilities and reporting locations	Operations and Logistics Section Chiefs
8	Develop the resources, support and overhead order	Planning and Logistics Section Chiefs
9	Develop communications, medical, planning and logistics plans	Planning and Logistics Section Chiefs
10	Approve and implement the plan	Incident Commander approves and general staff implements

