



# Exercise Initial Response, Command, and Control for Vegetation Fire Operations - Initial Attack Incident Controller *Student Notes*



**Unit Standard 3290**

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# Acknowledgments

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The National Rural Fire Authority acknowledges the help of Rod Farrow and Ian Millman in preparing this course.

Reference material consulted, used, copied and plagiarised:

NWCG	Boise (S-200)	Initial Attack Incident Commander
MNR	Ontario (S-300)	Initial Attack Fire Boss Course
AFS	Alberta	Initial Attack Crew Leader Training
NWCG	Boise	Planning for Initial Attack booklet
Donald G Perry		Wildland Firefighting (2nd edition)
NRFA	(100 Series)	Fundamentals of Forest and Rural Firefighting
NRFA	(200 Series)	National Standard Course for Crew Boss

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## Update Summary

March 2006

A summary of all updates made to this material from date of first publication is recorded below:

Changes to text page 23  
Moved exercises/questions to a separate workbook  
Taranaki Falls – use CIMS Organiser (amend text on exercises to include this)  
Safety Management Guidelines – pp 22-25 (taken from Referral Notes)  
Removed the discussion starter /what if questions – for use as flashcards in lesson plan.

Document Title: Initial Attack Student Notes  
First Published: 2005, 2006  
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Staff having recommendations for change to contents  
or layout should notify:

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## **Part 1: Getting Started**

# Introduction

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## What do I need to know?

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### Welcome

Welcome to this course on how to *Exercise Initial Response, Command, and Control for Vegetation Fire Operations*, supporting Unit Standard 3290.

### Who's it for?

This course is for Crew Leaders whose role is, or will be, the Incident Controller during the initial response to a vegetation fire. Formerly known as Initial Attack Fire Boss, and now called the Initial Attack Incident Controller (IAIC).

### Before I start this course...

Before beginning this course you need to provide evidence of competency in Unit Standard 14564 *Demonstrate knowledge of the fire environment on vegetation fire behaviour*, or demonstrate equivalent knowledge and skills. We also recommend you have **prior** competency in the Crew Leader qualification, *Lead a vegetation fire crew*, Unit Standard 3291.

### What do I need?

As well as these Student Notes, you'll need:

- A copy of the green *Rural Fire Management Handbook* (RFMH)
- A pink card (available from your Rural Fire Authority (RFA)); and
- A copy of the *Fire Plan* for your RFA
- A Taskbook (available from FRSITO)

### How do I use the material?

### What now?

- Read through these notes and complete the questions and/or exercises in the Workbook
- Update and correct your answers as you learn new information
- Your answers in the Workbook will be part of your formal assessment
- Return your completed Workbook to your course director for checking at least one week before you attend the training session - you'll get it back when you attend the session

**Completing the questions in the Workbook is a pre-requisite for attendance at the training session. The session exercises build on the material in these Student Notes.**

### Support

If you have any study problems, ask your Course Director for advice.

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## What do I need to know?, Continued

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### Assessment

***There are specific assessment guidelines compiled by FRSITO for this unit standard.***

*Satisfactory completion of this training package will contribute towards your portfolio of evidence for assessment against the Unit Standard 3290. The designated assessor will require the participant to at least complete the following satisfactorily:*

- 1 These Workbook completed and submitted for approval to the Assessor.
  - 2 Attendance and participation (including completion of the exercise) in the training session.
  - 3 Because each participant's practical experience differs, your next step will be to contact an approved Assessor and discuss the requirements you need to fulfill. This could include attestation of previous practical experience and/or practical assessment.
- 

## Your tools - RFA Fire Plan

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Fire plans are required under the Forest and Rural Fires Act 1977, and regulated by the *Forest and Rural Fires Regulations 2005*.

A fire plan is to include policies and procedures that the RFA has to reduce the likelihood and consequence of fires in its district.

**Check your fire plan for any standing instructions necessary to your role as Initial Attack Incident Controller.**

Please familiarise yourself with the section in your RFA's Fire Plan on Initial Response to a fire and setting up an ICP.

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# Your tools - The Green Book, RFMH

A key tool

**The Rural Fire Management Handbook (RFMH) is one of your key tools on the job.**

To help you learn how to use it on a fire ground, we'll refer you to it often during this course. It's a source of vital technical information that can support correctly informed decisions.

It contains summarised information with bullet points, tables and checklists with respect to:

See inside covers for LACES & Watchouts

**Section 2 – Safety**

- Personal Safety
- LACES
- Safety Briefings
- Use of vehicles, machinery and aircraft
- First Aid

**Section 3 – Initial Attack**

- Response
- IA Checklists
- Transition (from IA to Extended Attack)

**Section 4 – Incident Management**

- Control
- Planning and Intelligence
- Operations
- Logistics

**Section 5 – Operational Guidelines**

- Objectives & Strategies
- Communications
- Media Management

**Section 6 – Fire Behaviour**

- FWI Structure
- Fuel Load Tables
- Rate of Spread (ROS) Tables
- Fire Intensity Tables
- Fire Danger Classes

**Section 7 – Fire Investigation**

- Information and Reports

The RFMH is an operational guide. It is designed to support a fire authority's policies and operational requirements as contained in your fire plan.



# Terminology

**Terminology** used in these guidelines is in accordance with the *Rural Fire Management Glossary of Terms*<sup>1</sup> issued by the National Rural Fire Authority. Understanding the following key terms is vital to doing the job well.

<b>Allocated Resources</b>	<i>Resources dispatched to an incident</i>
<b>Assigned Resources</b>	<i>Resources checked in and assigned work tasks on an incident</i>
<b>Available Resources</b>	<i>Incident-based resources ready for deployment</i>
<b>Briefing</b>	<i>A general overview of an operation</i>
<b>Changeover</b>	<i>The orderly replacement of personnel (as in CIMS definition)</i>
<b>Check-in</b>	<i>The process whereby resources first report to an incident</i>
<b>CIMS</b>	<i>Coordinated Incident Management System. A structure to systematically manage emergency incidents</i>
<b>Command</b>	<i>The internal direction of members and resources of an agency (or organisation) in the performance of that agency's role and tasks. Command relates to single agencies and operates vertically within an agency.</i>
<b>Control</b>	<i>The overall direction of response activities in an emergency situation. Control relates to situations and can operate at either the single agency level or horizontally across (multiple) agencies.</i>
<b>Control line</b>	<i>Any line, including the fire-line, natural fire-breaks, and/or retardant lines, from which the fire is being fought. For example, a fire may be fought from a creek, road, fire-break or from a series of fire-breaks connected by fire-lines. The total endeavor is a control line.</i>
<b>Co-ordination</b>	<i>The bringing together of agencies and resources to ensure a consistent and effective response to an incident.</i>
<b>Debriefing</b>	<i>A critical examination of an operation done to evaluate actions for documentation and future improvements.</i>
<b>Demobilisation</b>	<i>The orderly release of resources no longer required at an incident.</i>
<b>Fire Ground</b>	<i>Any area of land, vegetation, or property where the fire is burning, or has burnt, or is threatening (to burn), in the opinion of the Fire Officer.</i>
<b>Fireline</b>	<i>That portion of the fire perimeter upon which resources are deployed and are actively engaged in fire suppression action.</i>
<b>Handover</b>	<i>The passing of control of an incident from one person or organisation to another.</i>
<b>IAP</b>	<i>Incident Action Plan: A statement of objectives, strategies, and critical functions to be taken at an incident.</i>
<b>ICP</b>	<i>Incident Control Point: The location where the Incident Controller provides overall direction of response activities.</i>
<b>Initial Attack</b>	<i>The action taken to halt the spread or potential spread of a fire by the first fire fighting force/s to arrive at the fire.</i>
<b>Logistics</b>	<i>The provision of facilities, services, and materials in accordance with the Incident Action Plan.</i>
<b>Objective</b>	<i>A statement of what is to be achieved.</i>
<b>Operations</b>	<i>The direction, supervision, and implementation of tactics in accordance with the Incident Action Plan.</i>
<b>Planning/ Intelligence</b>	<i>The collection, evaluation, and dissemination of information related to the incident and the preparation and documentation of the Incident Action Plan.</i>
<b>Situation Report</b>	<i>A brief of an incident, usually given at regular intervals (CIMS)</i>
<b>Strategy</b>	<i>A statement detailing how an objective is to be achieved.</i>
<b>Tactics</b>	<i>Specific actions or tasks to implement incident strategies.</i>
<b>Task</b>	<i>A job given to a team or individual.</i>

<sup>1</sup> <http://www.nrfa.org.nz/glossary/index.html>

# Overview

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## From Crew Leader to IAIC

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### Just do it!

**The move from crew leader to this first stage of incident controller requires adjustments in how you *think* about your role as well as how you *do your job*.**

- As a firefighter, you've just got on with the job
  - As a crew leader, you've assigned tasks and managed crew members as directed by operations management personnel (sector supervisor, division commander, ground operations manager), or the Incident Controller
  - As an Initial Attack Incident Controller (IAIC), you're responsible for forming objectives, strategies and tactics – at both small and large incidents – and possibly, for directing multiple resources within an appropriate span of control
- 

### RFMH Sections 3 & 4

Read **Section 3** of your Rural Fire Management Handbook (RFMH) for:

- a Definition of *Initial Attack* (RFMH 3.1); and
- the tasks that the IAIC needs to carry out from when first *Responding to a reported incident* (RFMH 3.2) through *Getting to work* (RFMH, 3.5) to *Transition* (RFMH 3.7)

Compare this with the role of IC under CIMS (see **Section 4.1.1**, RFMH).

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**Complete Exercises 1 & 2 in your Workbook.**

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## IAIC – Where do you fit in the Organisational Structure?

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### Incident Control

**Every incident requires a management structure to ensure that control is carried out in a manner that is appropriate to the scale and complexity of the incident.**

Not all fires are the same, nor can they be managed in the same manner. There are 3 Fire Incident Levels – described in section 3.8 of the RFMH.

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Regardless of size there are 4 key functions that must be addressed at any incident (see RFMH 4.1 for the command structure of these functions):

- Incident Control (RFMH 4.1)
- Planning and Intelligence (RFMH 4.2)
- Operations Management (RFMH 4.3)
- Logistics (RFMH 4.4)

### CIMS

The NZ Coordinated Incident Management System (CIMS) is an organisational structure, which builds from the top down with the Incident Controller responsible for the overall management of an incident.

*The major benefit of CIMS is that it can change as the incident develops. The organisational structure develops to match the incident by delegation of responsibilities.<sup>2</sup>*

- At small or initiating incidents, all of the key functions are carried out by one individual - the Initial Attack Incident Controller
  - As an incident escalates in size and/or complexity, various functions are delegated to others
- 

### Span of Control

*Span of Control* is defined as the number of individuals or functions one person can manage effectively. In CIMS, the span of control for any person falls within a range of three to seven resources, with five being the optimum. Safe and effective operations require that all fire management positions maintain this span of control. Exceeding this has the potential to break down the efficiency and effectiveness of the command and control system.

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<sup>2</sup> Refer to The NZ Coordinated Incident Management System (CIMS) booklet – “Teamwork in Emergency Management” for further information.

## IAIC – What are your responsibilities?

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### Your major responsibilities..

All incidents require an IC who has responsibility for the overall management of the incident. This responsibility includes:

- Safety and welfare of all personnel involved
  - Monitoring weather, fire behaviour, crew's performance and resources
  - Developing and implementing the initial IAP
  - Deployment and management of resources
  - Providing information for incident planning in the event that transition to extended attack is necessary
  - Anticipating changes that may constitute hazard/s to the personnel involved
  - Providing information to the RFA
- 

### To meet these responsibilities you need to:

- Know the communication and reporting lines and the CIMS structure
  - Know the various role responsibilities
  - Assume control and provide leadership
  - Analyse and assess the fire situation
  - Organise, delegate and determine initial deployment of resources
  - Outline the initial deployment plan to the crew(s) for implementation
  - Develop the action plan
  - Brief crews of any changes to the initial deployment plan that may result from developing the action plan
  - Continually monitor the fire situation and progress of the crew(s)
  - Oversee any on-the-job training
  - Manage the safety of all personnel at the incident
  - Inform:
    - Report to and keep the RFA informed of incident status
  - If the incident is contained the next step is:
    - Demobilisation of resources – plan and manage release of resources; and
    - Prepare an incident report
  - If the situation escalates the next step is:
    - Transition to extended attack mode with additional resources being deployed [ie. handover of control, initial attack phase to extended attack (Span of Control)]
- 

***As the IAIC, you are responsible for the safety of all personnel at the incident.***

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# IAIC – What are your responsibilities?, Continued

Your actions and tasks

Safety First

**The role of the IAIC covers the following actions/tasks:**

1. **Gather essential information** about the fire and lead the initial attack crews to the fire
2. **Size-up the fire situation**, plan the strategy and tactics for control, and communicate with the home base as to the situation, strategy, and additional resources needed to suppress the fire
3. **Brief and deploy the initial attack forces**, make adjustments in tactics and deployment to meet changing conditions, and contain the fire
4. **Ensure control and complete suppression of the fire**, with a minimum area of loss, by efficient and prudent use of assigned fire resources
5. **Maintain adequate records**, complete administrative forms and reports, advise of values threatened, lost or damaged
6. **Participate in post-fire analysis and debriefs**

When do your responsibilities end?

**As the IAIC, you are responsible to provide leadership until relieved.**

- As IAIC, you maintain responsibility on a fire until it is declared out, or you have been relieved
- Should the fire escalate, the IAIC may be reallocated the job of Crew Leader, Sector Supervisor or Operations Manager

Who are you responsible for?

**As the IAIC, you are responsible to provide leadership to all crews at a fire:**

The **Sector Supervisor**, if this position is warranted, is under your direction.

- Their role is to ensure that the action plan is implemented and objectives are met in the assigned sector

The **Crew Leader** is under either your direction (or under the Sector Supervisor if warranted).

- Their role is to implement the attack plan you develop, following your instructions, in direct supervision of a Fire Crew

The **Firefighters** are under the direction of the Crew Leader.

- If you have a dual role as the IAIC and Crew Leader then they carry out the work skills and functions of this position under either your or the Deputy Crew Leader's direct supervision

Leaders Intent

All leaders of firefighters have the responsibility to provide complete briefings on:

- The Task** • **What** is to be done
- The Purpose** • **Why** it is to be done
- The End State** • **How** it should look when done

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## IAIC – What are your responsibilities?, Continued

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As IAIC, you are accountable to the PRFO for the consequences of the decisions (or lack of decisions) made in the management of the resources under your control. You need to understand the **distinctions** and the **relationship** between authority, responsibility and accountability:

- **Authority** is the legal right to command and control others and the power to enforce obedience
  - **Responsibility** is the obligation to take care of something or to carry out a duty, liable to be blamed for loss or failure etc; having to account for one's actions
  - **Accountability** is the obligation to give a reckoning (answer) for one's actions; being answerable for conduct or performance or non-performance of duty
- 

The statements below contain the 3 concepts of authority, responsibility and accountability and illustrate the relationship between them.

<b>The right to do the job</b> (what's the job?)	<i>The RFA gives the IAIC <b>authority</b> to carry out certain <b>responsibilities</b> to established standards.</i>
<b>The obligation to do a reasonable job</b>	<i>The IAIC will be <b>accountable</b> to the RFA for how s/he carries out those responsibilities.</i>
<b>What's a reasonable job?</b>	<i>The IAIC is to manage the fire suppression operation according to the Fire Authority's established standards. The IAIC is to carry out suppression efforts in a safe, cost-effective manner, following fire management objectives and to fulfill administrative requirements for reports and accountability.</i>

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## Standards and Policies – the measuring line

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**What standards does your RFA require?**

In effectively carrying out your role you'll need to at least meet the standards listed below. Your RFA's policies may require more specific limitations.

1. Initial attack forces will **arrive at the fire safely and fully equipped** within acceptable dispatch and travel times. *Your RFA may say how many hours is an acceptable dispatch and travel time.*
2. **Size-up** will include an accurate description of fire location, fire size, fire behaviour and rate of spread, current and predicted weather, fuels and topography, values threatened, hazards to firefighters, escape routes and safe areas.
3. The **initial attack plan** will include an accurate appraisal of resistance to control, initial attack force capabilities, resources needed to accomplish control and any constraints of the RFA policy.
4. **Initial briefing of fire crew(s)** will include tactical options, hazards and safety precautions, Fire Authority policies, and other local factors and considerations affecting fire suppression.
5. **Effective, prudent use of fire control resources** requires monitoring of conditions to anticipate hazards and risks, effective communications, good leadership and supervision skills and a concern for personnel safety and welfare.
6. **Administrative report** requirements will be met. All information required during the fire activity will be provided in a timely manner.
7. The **final fire report** as required by the Fire Authority, will be a complete and accurate record of events, use of personnel, equipment and supplies, and other fire management needs.
8. The **post-fire analysis** required by the Fire Authority will need a fair assessment of management topics.

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**Complete Exercise 3 in your Workbook.**

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## **Part 2: Getting the Job Done – Safety, Mobilisation and Planning**



# Safety

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## The IAIC's Role in Safety

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As IAIC, you **MUST NOT** become involved in hard physical work or other activities that reduce your ability to meet your responsibilities.

Why is Safety important?

As IAIC, you are now responsible to see that **others understand and follow** the rules for fireground safety.

1. **Firefighter and public safety** is the first priority for every fire management activity. It is never worth endangering people to protect resource or property. Our goal must be:
  - For all personnel to return home from an assignment fit and well, and
  - To keep the public safe - this may require the assistance of the police in clearing the public from within danger zones around the fire
2. Employers are bound by law to exercise a *duty of care* towards employees to ensure their safety, physical and mental well being in the workplace. In this context both volunteer and contract fire fighters are regarded as fire authority *employees* when engaged in fire control activities.
  - One way to carry out this *duty of care* and to avoid work emergencies (like entrapments) is to have well trained and confident crew leaders to ensure that sound work practices are used

Whose Safety are you responsible for?

**The responsibility for safety at all levels in the management structure at a fire is as follows:**

- The **Incident Controller** has overall responsibility of an incident and must make appropriate strategic decisions based on fire environment, weather forecasts, knowledge of the fire behaviour and resources available so as not to deploy people into potentially dangerous situations
- **Crew Leaders** have the responsibility within their Divisional or Sector assignments to:
  - Deploy crews and machinery at the local level to ensure the safety of both
  - Keep the **IC** informed of any developments likely to be of value in re-assessing the situation
- **Individuals** have responsibility for their own personal safety and that of co-workers – this includes avoiding any action or lack of action that would jeopardise their own or others safety (eg. Rescuers)

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## The IAIC's Role in Safety, Continued

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What does Safety mean in practice?

**As IAIC you are responsible for appropriate:**

- Crew deployment
  - Do the personnel skills match the tasks?
- Crew rotation
  - Minimise smoke exposure by crew replacement and/or rotation rather than by use of respirators (may give a false sense of security when used)
  - Encourage self-pacing of work effort

Some people will have a different level of work output than others. Firefighters are not in competition with each other - they need to be working as a team to control the fire.

eg The **step-up** technique in building the fireline encourages self-pacing
- Shift lengths
  - The time that people are available for effective deployment at a fire will be influenced by the time they may already have worked that day (known as *working time*)
  - eg A person called to a fire at 1430 hrs may have commenced their normal work at 0700 hrs and have already been at their workplace for 7½ hours
- Transport arrangements
- Hydration arrangements
- Meals
- Rest breaks

**Trained and experienced firefighters are safer to work with and more productive than novices.**

Practical communication

**A vital part of leadership is letting people know who they refer information and decisions to. As IAIC you need to let people know you are in control. Three practical ways to do this are:**

- Identify yourself by the use of a command vest
- Verify the command structure and span of control
- Verify the communications plan (eg call signs, channels) with your crew leaders<sup>3</sup>

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<sup>3</sup> Visit [www.nrfa.org.nz](http://www.nrfa.org.nz) then see Incident Mgmt. Forms for a template of an IAP (including communications plan)

# Safety Management Guidelines

These next few pages summarise vital safety guidelines you must be use.

- 1 **Dangerous Situations Watchouts – refer pink card**
- 2 **Fire Orders - refer pink card**
- 3 **LACES – refer pink card or RFMH (Rural Fire Management Handbook)**
- 4 **Common Denominators of Fire Behaviour on Tragedy Fires**

There are four major common denominators of fire behaviour on fatal and near-fatal fires. Such fires often occur:

  - On relatively **small fires** or deceptively quiet areas of large fires
  - In relatively **light fuels**, such as grass, and light scrub
  - When there is an unexpected **shift in wind direction or in wind speed**
  - When **fire responds to topographic conditions and runs uphill** - alignment of topography and wind at a fire should always be considered a trigger point to re-evaluate strategy and tactics
- 5 **Environmental conditions that increase spar hazards:**

<b>Safety around Spars and Hazardous Trees</b>	<ul style="list-style-type: none"><li>• Strong winds</li><li>• Night operations</li><li>• Deep seated burning around the tree base</li><li>• High risk tree species (shallow root system)</li><li>• Windblown/uprooted trees</li></ul>	<ul style="list-style-type: none"><li>• Steep slopes</li><li>• Areas of diseased trees</li><li>• Overhead dead or broken tops and limbs</li><li>• Absence of needles, bark or limbs (dead spars)</li><li>• Leaning or hung-up trees (widow makers)</li></ul>
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- 6 **Power line Safety**
  - Downed powerlines on vehicle: stay in vehicle until power company arrives. If the vehicle is on fire or fire is near, jump clear, but don't hang on. Keep feet together and bunny hop away.
  - Smoke, water, and retardant are all good conductors of electricity and can cause arcing.
  - Don't operate heavy equipment under powerlines.
  - Don't drive with long antennas under powerlines.
  - Don't fuel vehicles under powerlines.
  - Don't stand near powerlines during aircraft water bombing.
  - Don't park under powerlines.
  - Don't apply straight jets of water, foam or retardant near powerlines.

**LOOK UP! LOOK AROUND! The presence of powerlines is not always obvious in today's environment!**

*Continued on next page*

## Safety Management Guidelines, Continued

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### Working with Aircraft

Refer to NRFA booklet *Aircraft Safety: Fire Management – Working with the Aviation Sector*

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### Vehicle and Machinery fires

When attending a vehicle fire care should be taken with respect to specific hazards:

- Fuel – petrol (unburned hazard)/ diesel (slipping hazard)
- CNG/LPG/methane powered vehicles
- Commercial vehicle loads
- Hazardous substances
- Airbags
- Pressure operated rams and hydraulic tailgates
- Tyres and wheels (explosion)

For more information we recommend you complete NRFA learning resource *Direct Defensive Control of Structure and Vehicle Fires*.

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### Rural/Urban Interface Watch Outs and Checklist

#### Structure related situations that are dangerous

- Wooden structures and wooden shingle roofs
- Poor access such as narrow roads and no exit roads
- Bridge load limits
- Structures in gullies or on steep slopes (30% or greater)
- Power lines and poles–watch for both overhead and fallen lines
- LPG cylinders and above ground fuel tanks with nearby vegetation or structures
- Vegetation adjacent to a structure

**Don't enter a burning structure unless you are trained, equipped, and authorised!**

**Firefighter safety and survival is the number one priority!**

#### Environmental related situations that are dangerous

- Steep terrain
- Strong winds
- Fine fuels that carry fire
- Increasing activity in fire behaviour

#### Operational situations that are dangerous

- Evacuations of public (panic), livestock, pets, animals
- Untrained members of the public attempting suppression actions
- Helicopter bucket filling operations
- Smoke

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## Safety Management Guidelines, Continued

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### Tactical Watch Outs

- Position**
- Working uphill of a fire
  - Building mid-slope fireline
  - Building indirect or parallel fireline, where unburned fuel remains between you and the fire
  - Attempting frontal assault on the fire
  - Terrain and/or vegetation that make escape to safety areas difficult
- Situation**
- Small fire developing into a larger fire
  - Suppression resources are fatigued or inadequate
  - Assignment depends on aircraft support
  - Night-time operations
  - Rural-Urban interface operations

**Each of these Tactical Watch Outs requires that appropriate hazard controls be implemented!**

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### Hazardous Materials Watch Outs and Checklist

#### General

- Evaluate from a safe distance
- Do not walk into or touch spilled substances
- Avoid inhalation of fumes, smoke and vapours, even if no hazardous materials are known to be involved
- Do not assume that gas or vapours are harmless because of lack of smell – odourless gasses or vapours may be harmful

#### Approach cautiously

- Resist the urge to rush in - you can't help others until you know what you're facing
- Stay upwind

#### Identify the Hazards

- Evaluate all of them and then source and consult the recommended guide page for that hazard before you place yourself or others at risk - placards, container labels, shipping papers and/or knowledgeable persons on the scene are valuable information sources
- Notify Firecoms of situation and seek expert advice

#### Secure the Scene

- Without entering the immediate hazard area, do what you can to isolate the area and assure the safety of individuals and the environment
- Move and keep individuals away from the scene and the perimeter

#### Obtain Help

- Advise Firecoms to notify responsible agencies and call for assistance from trained experts

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*Continued on next page*

## Safety Management Guidelines, Continued

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11, ctd

### Hazardous Materials Watch Outs and Checklist

#### Decide on Site Entry

- Any efforts you make to rescue people, protect property or the environment must be weighed against the possibility that you could become part of the problem

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### Safe Area Guidelines

- Avoid locations that are downwind from the fire
- Avoid locations that are in chimneys, saddles, or narrow gullies
- Avoid locations that require a steep uphill escape route
- Take advantage of barriers such as the lee side of ridges, large rocks, or solid structures
- **To protect from radiant heat, the distance between the firefighter and the flames must be at least 4 times the maximum flame length**
- The effects of heat from convection (uphill and/or down wind) will increase the safe distance requirement

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### Accessing a Fire Down-slope

Downhill access to a fire is hazardous in steep terrain:

- With fast burning fuels, or
- During rapidly changing weather conditions

### When accessing a fire downhill, the following is required:

**Only make the decision to access downhill to a fire (ie to commit resources):**

- **AFTER** both:
  - the Fireline Manager and Crew Leader(s) have discussed assignments, **and**
  - the proposed route has been scouted by the leader(s) of the involved resources, **and**
- **IF** LACES can be coordinated for all personnel involved, ie:
  - Crew leader is in direct contact with a lookout who can see the fire
  - Communication is established between all resources involved
  - Rapid access to safe area(s) in case fire crosses below resources, **and**
  - **IF** access will not traverse or be adjacent to a chimney, or steep gully, **and**
  - **IF** you can monitor the bottom of the fire - **IF** the potential exists for the fire to spread, you must take action to secure the fire edge

# Planning for SAFETY Management - Tactical Errors

## Common Tactical Errors on the Fireground

**Most fire fighter injuries occur when one or more of the following elements are present:**

- Grass or light fuels
- Taking a small fire for granted
- Topography which modifies the fire spread
- Fire fighters are in poor physical condition
- Failure to recognise changing fire behaviour
- Inexperience in vegetation firefighting
- Driving ability off road
- Not recognizing changing weather conditions – especially wind speed and direction
- **No Anchor Point** - even with the smallest of fires, no attack should be made unless an anchor point has been established. This anchor point provides security and safety during a flank attack.
- The **over-aggressive attack** - usually occurs when the crew tries to make an attack in such a hurry that spots are missed, leaving gaps in the fire line. When this happens and if the wind changes direction or increases in force, firefighters can be trapped by the escaping fire.
- **Head attack** - similar effects can happen attempting a head or frontal attack. Using no anchor point or safety zone, crews go into unburnt fuels to reach the head, assuming that winds or fire behaviour conditions will remain constant.

All fires, regardless of size and intensity, should be treated with caution. Anchor your attack. Use a barrier, road, fire origin etc. to keep the fire from later outflanking your personnel.

*A basic direct attack working up the flank(s) from a common anchor point is recommended.*

See pink card

+ RFMH

**Know the 10 standard safety orders, LACES and Dangerous Situations to Watch Out for.**

These are all listed in the RFM Handbook (green book) and on the latest version of your *pink card*. As part of your safety briefing, ensure all your firefighters have a pink card.

- As an IC, keep a *Green Book* in your top pocket for easy reference at all times
- Use the safety checklists – note those relevant to the current situation and what you need to do

# Risk Management Process

Fireground safety requires careful management of risk. This is a continual process of gathering and analysing information, planning, implementation and clear communication.

This series of steps outlines this risk management process and identifies the IAIC's obligations with respect to each step.

<b>Step 1</b>	<b>Situation Awareness</b>	
	<ul style="list-style-type: none"> <li>• Gather information</li> <li>• Identify hazards</li> <li>• Current and future situations (fire behaviour)</li> <li>• Local factors</li> </ul>	<ul style="list-style-type: none"> <li>• Communications plan</li> <li>• Weather forecast</li> <li>• Who's in charge</li> <li>• Scout the fire</li> <li>• Tactical Instructions</li> </ul>
<b>Step 2</b>	<b>Hazard Assessment</b>	
	<ul style="list-style-type: none"> <li>• Estimate potential fire behaviour hazards</li> <li>• Identify tactical hazards</li> <li>• Watch out situations</li> </ul>	<ul style="list-style-type: none"> <li>• Look up/look down/look around indicators</li> <li>• What other safety hazards exist?</li> </ul>
<b>Step 3</b>	<b>Hazard Control</b>	
	<ul style="list-style-type: none"> <li>• Fire Orders</li> <li>• LACES</li> </ul>	<ul style="list-style-type: none"> <li>• What other controls are necessary?</li> <li>• Continually re-evaluate</li> </ul>
<b>Step 4</b>	<b>Decision Point</b>	
	Are controls in place for identified hazards?	<ul style="list-style-type: none"> <li>• NO – Reassess situation</li> <li>• YES – Next question</li> </ul>
	Are selected tactics based on expected fire behaviour?	<ul style="list-style-type: none"> <li>• NO – Reassess situation</li> <li>• YES – Next question</li> </ul>
	Have instructions been given and understood?	<ul style="list-style-type: none"> <li>• NO – Reassess situation</li> <li>• YES – Initiate action</li> </ul>
<b>Step 5</b>	<b>Evaluation</b>	
	<ul style="list-style-type: none"> <li>• Do the personnel skills match the tasks?</li> <li>• Fatigue or stress?</li> </ul>	<ul style="list-style-type: none"> <li>• Is the situation changing?</li> <li>• Are the strategy and tactics working?</li> </ul>

**Complete Exercises 4 & 5 in your Workbook.**



# Mobilisation

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## Responding to a Reported Incident

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**Before you get there**

Review RFMH, sections 3.2 and 3.3 - this shows the minimum information you need to collect and analyse before getting to the fire. List that information in your workbook:

You also need to collect information on any known hazards and values at risk - list at least 5 known hazards and values in your Rural Fire Authority's area of responsibility in your workbook.

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**Complete Exercise 5 in your Workbook.**

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These are the *general* standards you need to meet when assembling and readying initial attack fire crew:

- Assemble and depart within an acceptable period of time, with a fully equipped initial attack force as determined necessary
  - Fire crew self checks for correct equipment and readiness for travel
  - Fire crew is given instructions and the directions for travel to the fire
  - Travel to the fire by the most appropriate means - vehicle, aircraft, boat, foot, or combination of these
  - Navigate through rural areas and/or across country
  - Travel by the most direct route
  - Follow safe travel practices
  - Use maps and other navigation aids to locate the fire
-

## En route to the incident

RFMH, 3.3 and 3.4

RFMH, 3.3 and 3.4 gives a checklist of actions to take while en route to and upon arriving at the fire. **Use this checklist on your way to an incident.**

- You also need to arrive safely at the fire within acceptable travel times
- If the fire is not located immediately, take action to find the fire

**While traveling to the fire area you have the opportunity for more effective control if you take certain actions.**

eg. As you approach the fire area you can:

- Request updated information on the fire status, fire behaviour and weather forecasts
- Review your assessment of *suppression efforts required* – and accordingly request more resources

What if you can't find the fire?

**If you can't find the fire:**

- Recheck your location
- Contact dispatch for better directions
- Contact observation plane (if available)
- Patrol area until fire is located or new directions are given
- Locate high ground to observe the area

Your kit

**Include these items in an IAIC's kit.**

- Organisation specific forms
- Rural Fire Management Handbook
- Initial Attack Checklists
- Incident Organiser Forms
- Office supplies
- Checklist of information about the fire prior to leaving for the fire
- Radio frequencies & phone numbers
- Radio w/ batteries
- Belt weather kit
- Marking tape/paint
- First aid kit & procedures
- Notebook
- Maps
- ...
- ....

# Fire Investigation – observation & scene preservation

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Fire investigation is made up of several stages:

1. **Crew Leaders and Rural firefighters cover elements of scene preservation and observations made en route to a fire.**
  2. Introduction to Rural Fire Investigation for first line investigators.
  3. Specialist Rural Fire Investigation (US Wildfire, F1-210).
- 

## En route to a fire

As IAIC, you and your crew(s) are responsible to gather observations on the way to a fire, as well as preserve the area of fire origin from damage (eg water/vehicle) as much as possible.

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**Note** Note the description of people/details of vehicles coming from the fire area, include:

- Time and location of the observation
  - Direction of travel
  - Vehicle details: model, colour, registration number, special features, etc
  - Identification details: race, hair colour, gender, build, clothing, special feature, etc
- 

## Protecting area of origin

Ensure your crew(s) take the following steps to **identify** and **protect** the possible area of origin of the fire.

**Ensure they:**

## At the Fire

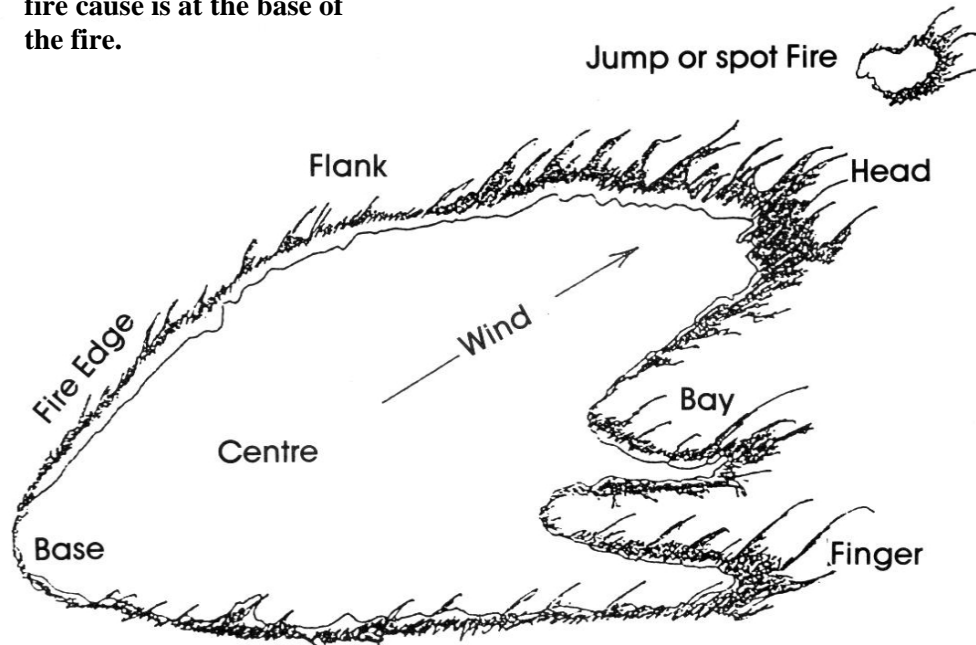
- Keep one foot in the black, one foot in the green - *walk the fire edge to avoid walking through the area of origin*, which is generally somewhere between the base and centre of the burnt area
  - Watch out for evidence of how the fire may have started
  - Consider where the likely area of fire origin may be and protect this area
  - Use only a fine spray to dampen down the likely area of origin to avoid disturbing the ground or any evidence of fire start - do not disturb the area by walking through with hose line routes, fireline construction etc
  - If possible, tape around the area of origin to close access
  - Keep firefighters out of the area of origin and do not handle any items of evidence
  - Record names and details of information from anyone spoken too
  - Obtain photos of bystanders (discreetly)
  - Take photos of any evidence that may get disturbed by the fire suppression operation
  - Draw a map of the fire area and or the surrounding area, showing where evidence was found and points of reference
- 

*Continued on next page*

## Fire Investigation – observation & scene preservation, Continued

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The most likely place to find clues to help determine the fire cause is at the base of the fire.



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*Suppression crews must proceed with caution while entering the base of the fire to avoid disturbing this area or any likely evidence.*

- 
- Note and protect this area for later investigation purposes
  - Note and protect any activity/item that may enable identification of a the likely cause of the fire

***Basically, record and protect everything that may relate to the cause of the fire.***

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**Complete Exercise 6 in your Workbook.**

# Initial Attack

## Overview

**Initial attack action is about getting control of a fire in as short a time as is possible.**

### IAIC responsibility

As IAIC you're responsible to **ensure control and complete suppression of the fire**, with a minimum area of loss, by efficient and prudent use of assigned fire resources.

### Key Principles

**Firefighting is basically a perimeter control exercise carried out in several stages.**

This table identifies the four stages required to bring a fire under control.

Phase	Action
1	Reduce the intensity of fire at the edges by knockdown of the flames and reducing the rate of fire spread.
2	Contain and hold the fire by securing the fire perimeter so as to prevent further spread. At this point there will be active burning <i>within</i> the secured perimeter.
3	Control those areas of active burning within the secured area that have the potential to escape, ie. Ember transport and spotting.
4	Complete fire extinguishments by mop-up action.

### Caution

**In situations where fuel inside of the fire line continues to burn actively then sufficient resources must be deployed to ensure security of the flanks behind advancing resources.**

### Note

In the early stages of a fire, you require resources both to knockdown and contain the fire perimeter (being held) and to secure it (under control).

- Your resourcing needs to allow for both perimeter growth and fire containment, otherwise the fireline may be breached by the fire
- Remember, the initial attack must focus on halting the spread of fire and containing it as rapidly as possible
- If time is taken to extinguish the interior of the fire area the chance of gaining control rapidly is lost and an escaped fire may result

**The *safest* approach for ground crews is the standard practice of *direct attack* commencing from an anchor point and securing the fire edge at the flanks (ie. one foot in the black) using a pincer approach to gain control of the head from behind.**

# Initial On-Site Actions

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Once you arrive at the fire there are a number of **key actions** that you need to carry out before getting to work. This is a vital point where the IAIC thinks differently from Crew Leaders and Firefighters.

The intent is to start controlling the fire as soon as possible – but first:

**STOP  
and take a minute**                      **BE CALM,  
and**                      **LOOK  
at the total picture**

**This period is critical to the success of the initial attack.  
The decisions made at this time will determine the success of the operation.**

If you suffer an adrenaline burst and ‘go off in all directions’ little will be accomplished.

Remember:

1. **Assess** the overall situation, make an **initial size-up** of the fire and **determine** what **immediate action to take**.
2. Follow this by a more detailed size-up and analysis of the situation in order to plan and develop an Incident Action Plan.

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The initial attack process follows three phases:

<b>Phase</b>	<b>Action</b>
1	Initial size-up, briefing and deployment.
2	Review the situation – carry out a comprehensive size-up and provide a SITREP.
3	Develop an IAP – identify resource requirements, review deployments.

# Phase 1: Initial size-up, briefing and deployment

Phase	Action
1	<b>Initial size-up, briefing and deployment</b>
2	Review the situation – <del>carry out</del> a comprehensive size-up and provide a SITREP.
3	Develop an IAP – identify resource requirements, review deployments.

## Arriving at the Fire

### Arriving at the Fire (3.4, RFMH)

Go to your checklist in the Green Book (RFMH 3.4) and add these two points:

- Confirm fire location (use map coordinates or other appropriate means)
- Advise of any other resources that may already be on-site

Following the checklist in your RFMH, communicate your arrival time back to the RFA or Comcen.

## Carry Out an Initial Size-up

**Follow** this checklist when arriving at the fire (RFMH 3.4): fourth on the list, is to *size up the fire*.

### The Choices

**As you assess the size and complexity of a fire, you have three broad choices:**

- There is obviously **no problem**
- The likelihood of containing this fire is **marginal**
- The fire is **beyond** the capability of the resources at hand

To make an informed choice, you need to study the fire and any special problems that may be connected with it. If you can't see all of the fire, or you don't know what is in its path, go and have a look.

### The Purpose

**Size up the fire situation so that you can:**

- Confirm the information obtained during mobilisation
- Determine hazards to firefighters
- Determine whether the fire can be controlled with the resources that are on site or en route
- Determine whether there is an **immediate** need to request or put on standby additional resources

### The Priorities

**a. Safety of people must be first.**

- What's the objective of the attack?
- What attack options do you have?

**b. Taking immediate suppression action is second.**

*When do you choose Hand tools over Hose line?*

**Once** safety is ensured, a concerted effort can often contain the spread of fire shortly after ignition. You need to recognize that the **time** taken to find a water source, set up a pump and lay a hose line may allow a fire to escape that could have been readily controlled with hand tools.

*Continued on next page*

## Phase 1: Initial size-up, briefing and deployment, Continued

- Analysing the information and making decisions should only take a few minutes

### Take the time to do this!

- Not taking time to provide reasonably good answers to these questions is often the first step to failure in initial attack and can be very dangerous

To analyse the situation, consider:		
The Factors	<b>Fire size on arrival</b>	Length of perimeter and number of resources.
	<b>Fire environment</b>	Fuels, topography, weather – <i>what's ahead? Changes?</i>
	<b>Time of day</b>	Will intensity increase or decrease? <i>eg. Midday or late afternoon?</i>
	<b>Behaviour of fire</b>	ROS? Flame length? Spotting? How far?
		Estimate ROS – how far does the head travel in 1 minute and project this to the fire line, estimate behaviour of fire at the planned line - will it be hotter, spreading faster, spotting etc.?, identify possible danger spots – flash fuels, dead spars? What if the ROS and intensity increases?
	<b>Values ahead</b>	Structures? Crops? Plantation? Flora/fauna?
		<ul style="list-style-type: none"> <li>• Values at risk</li> <li>• Environmental, cultural or heritage issues</li> </ul>
	<b>Resources</b>	What is needed? Where are they? When will they arrive? Allow for hold-ups. Is there an immediate need for additional resources?
	<b>Origin</b>	Protect the <b>area of origin</b> from disturbance for later investigation. <i>eg. block access with vehicle, assign someone to guard POO.</i>
	<b>Identify appropriate locations for fire line construction</b>	Start from a good anchor point, avoid large heaps of fuel or other possible danger spots, take advantage of easier construction areas, allow enough time and distance from the fire to take care of any unseen factors such as a tractor getting stuck, increasing winds etc.
	<ul style="list-style-type: none"> <li>• Escape routes and safe areas</li> <li>• Direct attack using <i>one foot in the black</i> methodology</li> </ul>	

Continued on next page



## Phase 1: Initial size-up, briefing and deployment, Continued

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### Determine immediate incident objectives, initial strategy and deployments

**RFMH 3.4** Having collected information (size-up), take the time to apply that information. This enables you to clearly and accurately *determine the immediate incident objectives* and the *resource* situation.

**Documentation** It's an industry requirement that a fire log of all events is maintained for every fire incident. You need to **note** situations and observations, **and save** for future reference (e.g. possible legal action).

**e.g,** This may be the log taken through Fire Comms or by the admin support logging radio/telephone calls or use of the CIMS organiser or personal log notes at the back of the RFMH/pocket notebook.

**Ordering resources**

- Develop a list and consolidate orders for supplies
- Order in a timely manner
- Consider lead times
- Prioritise ordered items
- Support needs for resources ordered
- Document what is ordered and time ordered
- Required time and location for delivery
- Use correct terminology for items
- Follow-up on orders with dispatch
- Follow organisational guidelines

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*Continued on next page*

## Phase 1: Initial size-up, briefing and deployment, Continued

**You have now decided:**

- How fast the fire is spreading
- The location and type of fireline
- Where and how to attack the fire

Getting to  
Work  
RFMH 3.5

<b>Determine an initial attack plan</b>	
<b>Step 1</b>	<ul style="list-style-type: none"> <li>• Identify escape routes and safe areas</li> <li>• Fuel, topography, and weather effects on fire behaviour</li> <li>• Hazards to firefighters</li> <li>• Anchor points</li> <li>• Where and how to attack the fire</li> </ul>
<b>Step 2</b>	<b>Brief your crew and begin work (see briefing guidelines on next 3 pages)</b> <ul style="list-style-type: none"> <li>• Assign tasks (individual jobs)</li> <li>• Methodology (techniques are required)</li> <li>• Safety needs (hazards, mitigations, fire safety)</li> </ul>
	<b>Make the initial deployment of resources and go to work</b> <ul style="list-style-type: none"> <li>• Deploy personnel</li> <li>• Protect the origin and preserve evidence</li> <li>• Continue with size-up</li> </ul>
<b>Step 3</b>	<ul style="list-style-type: none"> <li>• Continue assessment</li> </ul>
<b>Step 4</b>	<ul style="list-style-type: none"> <li>• Preview/review initial attack checklist</li> </ul>

**Complete Exercise 7 in your Workbook.**

# Briefing Guidelines

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These guidelines provide a format for briefings and provide a checklist to assist in preparing and delivering briefings.

## Why give briefings?

Briefing crews is vital to the success of suppression operations and to the safety of personnel. The purpose of a briefing is to provide an overall picture of the situation, details on tasks allocated and responses to questions.

By the completion of the briefing all concerned must know:

- The objective – **what** is intended to be done
- The strategies – **how** it's intended to be done
- Tactics and tasks – **what part** they have to play

## General tips

### When conducting briefings:

- Use an area away from danger and distractions to reduce the risk of misunderstanding or injury
  - Begin briefing by introducing yourself and saying there will be an opportunity for questions at the end of the briefing
  - Speak clearly, calmly and confidently
  - Ensure the atmosphere of the briefing allows those being briefed to ask questions – for clarity and to question content, eg selected tactics if relevant
  - End briefing with an opportunity for questions
- 

## Format of briefing

- Conduct the briefing formally
  - Follow an agenda
  - Use this **SMEACS-Q** for your format
  - Maximum time - 15 minutes
- |          |                                   |  |
|----------|-----------------------------------|--|
| <b>S</b> | <b>Situation</b>                  | Current and predicted situation, weather, resource deployment                    |
| <b>M</b> | <b>Mission</b>                    | Incident objectives and strategies   |
| <b>E</b> | <b>Execution</b>                  | Tactics, tasks, sectorisation  |
| <b>A</b> | <b>Administration + Logistics</b> | Logistical arrangements, locations of staging areas, ICPs, and operations points |
| <b>C</b> | <b>Command and Communications</b> | Incident Management Structure, Communications Plan, radio channels               |
| <b>S</b> | <b>Safety</b>                     | Known and anticipated hazards  |
| <b>Q</b> | <b>Questions</b>                  |  |

See next 2 pages for detailed outline of SMEACS-Q format.

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# SMEACS-Q Briefing Format

**SMEACS-Q** Consider the following for the purposes of any fire briefing. Some elements may not apply to all incidents but for each briefing – consider their relevance.

<b>Subject Matter</b>	<b>Suggested Elements</b>
<b>Situation</b>	Current and predicted situation, weather, resource deployment <b>Use Maps</b>
Why am I briefing you?	Purpose of briefing
What's happened up till now?	Where the fire started (origin) How did it start (suspected cause) What's been burnt (life/ property/assets)
What's happening now?	Fire status What's being burnt now What factors are affecting fire behaviour now – ie fuels, weather & topography What major factors (if any) are affecting fire suppression now – safety considerations, environmental constraints, fire behaviour factors, resources Brief resources overview
What's likely to happen?	What factors are expected to affect fire behaviour in the near / medium future What could be burnt Relevant resource movements
<b>Mission</b>	Incident objectives and strategies
What are we trying to achieve?	Objectives: what are we trying to protect? What are we prepared to lose? Strategies and relevant tactics
What is my specific task?	Tasking details (include sector deployment orders if appropriate)
	SMART – Specific, Measurable, Achievable, Relevant, Timely
<b>Execution</b>	Tactics, tasks, sectorisation <b>Use Maps, communications plan, sector plans or other relevant plans</b>
How do we plan to achieve the mission/ objective?	Your authority to act Details of any sectorisation Strategies and tactics relevant to the recipient Resources available, Timeframes, Constraints Implications of not achieving targets

*Continued on next page*

## SMEACS-Q Briefing Format, Continued

<b>Administration and Logistics</b>	Logistical arrangements, locations of staging areas, ICPs, and operations points
What are the logistics of the operation?	ICP location, Operations Points Staging areas, Sector points, Water points Recording requirements including T-cards Time keeping – people, machinery Catering and accommodation Plans – eg. Traffic plans Support – mechanics, radio technicians, medical / first aid Ground support – especially fuel Supply issues
<b>Command and Communications</b>	Incident Management Structure, communications Plan, radio channels <b>Use communications plan</b>
Who's in charge?	List of who is performing senior / key IMT roles
Who should you be talking to, how often and about what?	Reporting links, frequency and content
How do I communicate?	Outline the Communications Plan
<b>Safety</b>	Known and anticipated hazards
What are the hazards?	Known or anticipated hazards, including fuels, weather, topography, equipment – eg. Bulldozers, aerial attack, power lines Reminder regarding WATCHOUTS and any that are specifically an issue in this instance; LACES, escape routes Welfare issues
How do I know if something is not going according to plan?	Fire ground information updates and situation reports.
<b>Questions</b>	
	Invite recipients to ask questions to clarify briefing content The presenter should ask questions to test understanding

## Phase 2: Review the Situation, Report, SITREP

Phase	Action
1	<del>Initial size up, briefing and deployment</del>
2	<b>Review the situation – carry out a comprehensive size-up, provide a SITREP and report.</b>
3	Develop an IAP – identify resource requirements, review deployments

Once your crew(s) have been deployed and are carrying out the immediate deployment action you now need to take more time to carry out a more detailed assessment and analysis of the situation and the resources that may be required and begin to develop a more **comprehensive Incident Action Plan**.

### Current

#### What is the current situation?

Continue to assess the fire situation to determine whether the fire can be controlled with the resources that are available, or whether additional resources are required

#### Review the initial actions taken in light of your current assessment and consider additional information that you need.

##### Consider Incident Management factors

- Modification to your initial deployments
- Safety requirements
- Span of Control requirements
- ICP and Assembly Area (AA) or Staging Area (SA) needs for incoming resources

##### Consider time and space

- How long will it take to build a fire line around the fire and stop its forward spread?
- Where will the head be then?
- Will the fire line contain the fire?
- Should burning out be considered?

#### Size up the fire situation to confirm IA information obtained during mobilisation and to determine whether the fire can be controlled with the resources that are en route and/or available at the time.

##### Consider these factors

- Fire size (perimeter length)
- Rate of spread, Fire intensity or flame length, Spotting
- Fuels burning
- Terrain
- Weather conditions
- Values at risk
- Resources available
- Water sources
- Natural or constructed barriers to fire

*Continued on next page*

## Phase 2: Review the Situation, Report, SITREP, Continued

### Potential

#### What are the potential fire behaviour and resources?

- Analyse **Current** and probable fire environment
- Predict situation **30 minutes** later
- Predict situation **60 minutes** later

#### Consider these factors

- Fire size
- Rate of spread
- Fire intensity
- Chances of extreme fire behaviour
- Protect the "**area of origin**" from disturbance for later investigation.

#### What do I need so I can analyse Fire Behaviour?

**I need** to develop a good understanding of **fuel** types, fuel transition zones, fuel loadings and age classes; and

**I need** to develop a good understanding of **Fire Weather**. The most critical evaluation element is a knowledge of local conditions:

- Average local wind speed and direction?
- Local average daytime temperature?
- Average daytime relative humidity?
- Are there local geographic areas that exhibit erratic winds or weather?
- Do maritime influences affect fire weather?

**I need** to develop a good understanding of important **Topographical** components relating to deployment of resources:

- Fires burning on the northerly **aspect** have a greater potential to escape initial attack
- **Slope** is important to fire spread, as it aids preheating and ROS
- The fire is likely to create fingers in an area of **broken topography**: narrow gullies, chimneys, saddles and ridgelines can modify fire behaviour and tactical decisions - broken **topographic** features, such as rock outcrops, modify slope winds and create eddies

*For more on Fire Behaviour and Related Indicators, see the Student Notes for Demonstrate Knowledge of the fire environment on vegetation fire behaviour.*

### Resources

#### Determine fire crew capabilities

#### Consider these factors

- Calculate fire line construction rates based on the resources being used and the resistance to progress at various portions of the fire line
- Assess fuel type, arrangement, loading, terrain and fire behaviour factors

*Continued on next page*

## Phase 2: Review the Situation, Report, SITREP, Continued

---

### Provide a Situation Report – SITREP

**RFMH 3.4** You need to report the current fire situation – a bit later on we'll show you a SITREP template that you can use as a checklist to ensure you provide the information required:

- eg
- Existing situation – fire size, ROS, fuels burning, fire behaviour, potential threats to life, property, and natural resources
  - Initial plan of attack
  - Ability to control the fire and the need for additional resources – be specific

### Report **Report the current fire situation**

- Existing situation (fire behaviour, etc.)
  - Plan of attack
  - Need for additional resources.
- Include**
- Potential threats to life, property, and natural resources
  - Ability to control the fire
  - **Time objectives**
  - Need for additional personnel, equipment and supplies
  - **Pinpoint and report locations** using coordinates or other appropriate means
  - Determine area and/or perimeter of the fire
  - **Protect the area of origin** (and possible cause) of the fire
-



## Phase 3: Develop an IAP

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Phase	Action
1	Initial size-up, briefing and deployment
2	Review the situation – carry out a comprehensive size-up and provide a SITREP
3	Develop an IAP – identify resource requirements, review deployments

---

### Think ahead

#### What is Planning?

To be effective leaders we need to think ahead, to consider options and consequences, to make decisions – in other words - to plan.

*As the IAIC, you are responsible for development of the Incident Action Plan.*

---

Whether the nature of the fire incident is small or large, simple or complex; whether you use the mental note process or a form for the Incident Action Plan, the key points to consider and the assessment / planning processes are much the same.

#### The process of Planning – 5 keys

1. Information gathering
2. Situation Analysis
3. Develop the Incident Action Plan – Objective, Strategies, Tasks
4. Implement the Incident Action Plan
5. Safety

**Although we separate these stages into 5 keys to simplify communication, in practice they are inseparable.**

---

### What is an IAP?

An IAP is a statement that sets out the situation, identifies objectives and strategies to manage the situation, and provides information with respect to personnel, communications and safety issues.

#### IAP

- To complete an effective Incident Action Plan we need to collect information, consider and analyse the available options, resources and tasks; and communicate effectively and continuously
- During the initial attack phase this process may only be a thought process, with verbal communications; if the incident becomes an extended attack, CIMS provides a template IAP for consistency and convenience

Use of a written *checklist* is encouraged to ensure that you haven't overlooked any points, eg. RFMH Section 3.6.

---

# Initial Attack Plan: Plan, Consider + Decide

Plan

**Successful planning requires us to choose the most appropriate methods of attack given the resources available and the conditions existing at the fire.**

Consider

So, what resources are available? And, what conditions exist at the fire?

- Control objectives (in what time period? is it realistic?)
- Control force capabilities (are the resources adequate to meet objectives?)
- Fire line conditions (escape routes)
- Values threatened
- Fire management policies
- Develop alternate plan
- Anticipate the unexpected
- Identify reinforcements needed
- Order resources for worst-case scenario – they can always be turned around

**Avoid under estimating the fire's potential.**

Decide

**Decisions to be made**

- **Where** to attack the fire
- **How** to attack (direct, indirect, parallel)
- **Location** of control line(s)
- **Type** of control line needed (width, burnout, etc.)
- **Resources** needed to construct control line and hold it
- **Help** needed

*Make a decision, but be flexible enough to allow for unexpected changes*

Judgment

**Two key factors in good decision making are judgment and potential.**

**You need the confidence to say:**

- Based on my **judgment**, the situation is of initial attack size / an extended attack / a major emergency.
- Make the decision, but be flexible enough to allow for unexpected changes.
- Avoid being rushed into early deployment or freelance fire fighting actions. If you're unsure, seek a second opinion from the next arriving fire officer.
- **Judgment** should not be thought of in terms of good or bad, but rather, experienced or inexperienced.

Potential

- Avoid under estimating the fire's **potential** based on present conditions (weather, topography, fuel, response times etc.).
- Order resources for the worst-case scenario - they can always be turned back.

# IAP Development

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<b>What is the current situation (size-up/assessment)?</b>	<b>1. Situation (size-up / assessment)</b> <ul style="list-style-type: none"><li>• Facts/action taken so far</li><li>• Resources in place / required</li><li>• Factors (limitations due to fire intensity, rugged terrain etc)</li><li>• Predicted development of the fire</li><li>• Options (consider alternative action/s that maybe taken)</li></ul>
<b>What is your desired outcome (objective)?</b>	<b>2. Options Analysis to achieve the Objective</b> <ul style="list-style-type: none"><li>• Are there any options as to the action that may be taken?</li><li>• If there are other options, what is involved / required for each option?</li><li>• What are the consequences of each option?</li><li>• Select the preferred option</li></ul>
<b>How will you achieve the outcome (tasking + performance)?</b>	<b>3. How to achieve outcome (tasking and performance)</b> <ul style="list-style-type: none"><li>• On selecting the action to take, what resources are required to carry it out?</li><li>• What is the likely fire activity in 30 mins, 60 mins etc?</li><li>• How long is it going to take to implement and complete the action plan?</li><li>• Will the suppression activities be sufficient to cope with the predicted fire growth?</li></ul>
<b>Caution</b>	<b>Under-estimation!</b> <p>Most of the fires that escape initial suppression efforts, do so due to an under-estimation of the potential fire growth, the initial response resources required, and most importantly an under-estimation of the time taken to deploy and utilise the suppression resources.</p>
<b>What are your support arrangements (logistics)?</b>	<b>4. Support arrangements (logistics)</b> <ul style="list-style-type: none"><li>• Irrespective of the fire potential, support services should be in place.</li><li>• Safety considerations to cover response, actions at the fire and return.</li><li>• A contact for backup support, for organising resources.</li><li>• Support services maybe at a fixed location (office) or a mobile setup</li></ul>
<b>What is your Command structure + communications?</b>	<b>5. Command structure and communications</b> <ul style="list-style-type: none"><li>• Plot the command structure, with all the names of who is there.</li><li>• Include the communication set up, channels allocated and call signs etc.</li></ul>

---

## Recap - Objectives, Strategies and Tactics

---

**Development of strategies and tactics is based on an eight-step process:**

<b>Step</b>	<b>Action</b>
1	Evaluate information (size-up factors)
2	State your <b>objectives</b>
3	Consider an <b>alternative plan</b>
4	<b>Anticipate the unexpected</b> (fire behaviour forecast, equipment breakdowns)
5	Select a <b>tactical plan</b> that ensures highest probability of success consistent with personnel safety
6	<b>Implement the decision</b> (action plan)
7	<b>Monitor progress</b> (get feedback, hold briefings and meetings)
8	Take <b>corrective action</b> , if necessary.

**Complete Exercise 8 in your Workbook.**

---

# Initial Attack and Incident Action Plans

**Attack Method** An assessment of attack methods must be made in order to identify the method that will be the most efficient in meeting the objectives of fire control.

The time taken to find a water source, set up a pump and lay a hose line may allow a fire to escape that could have been readily contained with hand tools.

Using the scale of 1-5 (1 = No skill; 5 = highly skilled), rate your skill level for each principle of Initial Attack and each stage of the Action Plan listed below.

	1	2	3	4	5
<b>Skill</b>	None	New Skill	Competent	Practiced	Can train others

## Principles of Initial Attack

### How well do you currently...

<input type="checkbox"/>	Establish a good <b>anchor point</b>
<input type="checkbox"/>	Plan the attack in such a way as to <b>ensure safety of personnel</b>
<input type="checkbox"/>	<b>Limit fire spread</b> to lightest fuel type
<input type="checkbox"/>	Use " <b>direct attack</b> " where possible
<input type="checkbox"/>	<b>Attack the flank which has the greatest potential for escape</b> or development
<input type="checkbox"/>	<b>Burn out (or patrol) islands</b> of unburnt fuel near the fireline(s) if the potential for escape exists
<input type="checkbox"/>	<b>Avoid using a frontal attack</b> on the fire
<input type="checkbox"/>	<b>Keep out of paths of "least resistance" to fire spread</b> areas: saddles, etc
<input type="checkbox"/>	Be aware of <b>topographical hazards</b> : steep slopes, rocky areas, gullies etc
<input type="checkbox"/>	Have an <b>escape route</b> planned at all times

## Action Plan

### How often do you think through these questions when forming your action plan?

<b>Objective</b>	<input type="checkbox"/>	What has to be achieved in a given time period? Is it realistic?
<b>Resources</b>	<input type="checkbox"/>	What can be accomplished with resources on hand? Are they adequate to meet the objective?
<b>Attack methods</b>	<input type="checkbox"/>	Are you going to use direct or indirect?
<b>Type of attack</b>	<input type="checkbox"/>	Which type of attack will be most effective? Do you need to use pumps, hand tools, bulldozers, aircraft to meet the objectives?
<b>Point(s) of attack</b>	<input type="checkbox"/>	Will the objectives be met by attacking the fire at one point or are there values to protect which will require splitting resources?
<b>Deployment</b>	<input type="checkbox"/>	Where is the best area to deploy resources based on method and type of attack? Are resources distributed effectively so that they are performing at optimum level to meet the objective?
<b>Resource use</b>	<input type="checkbox"/>	Plan how resources will be shifted around as the workload diminishes on particular tasks
<b>Escape Routes</b>	<input type="checkbox"/>	Are the routes known to all personnel? Are these routes practical and secure?
<b>Reporting</b>	<input type="checkbox"/>	The IAIC has responsibility to report observations made at the fire site, to the Fire Authority.

## **Part 3: Getting the Job Done – Operations Management**

# Implementation

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## Overview

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**Operations Management involves five key tasks for the deployment and management of resources:**

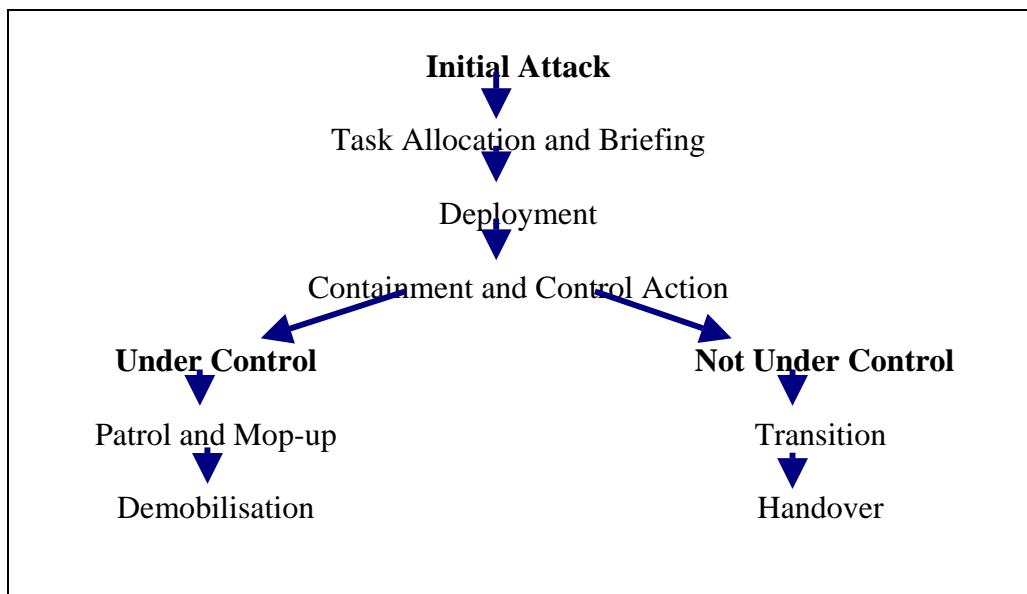
### Key Tasks

1. Brief personnel and assign work
2. Direct the suppression operation in a safe and effective manner
3. Keep abreast of changing conditions that will affect safety and suppression effectiveness
4. Adjust priorities and suppression action as needed to meet changing conditions
5. Make provisions for an extended period of suppression operations

**How would you fit these 5 key tasks into the tasks listed in the flowchart below?**

---

### Flowchart



# IAP Task Allocation and Briefing

**Task Allocation** **Allocate the tasks in the following sequence:**

1. Identify the skills and experience of the crew
2. List the jobs to be done
3. Allocate tasks (match individuals competence and fitness level to the required task)
4. Distribute the equipment

**1. Identify the Skills and Experience of the Crew**

It's important to know the capabilities of each person in the crew.

- If the IC/Crew Leader has previously worked or trained with the crew, you'll have this knowledge already
- If not, you need to find out about their level of competence before allocating them tasks

**Ask the crew about:**

- Competence or qualifications held or training undertaken in rural fire fighting
- Experience in rural fire fighting
- Any medical problem that may be aggravated by firefighting activities
- Their local knowledge

**Be prepared to stand down untrained people.**

- Only consider pairing off the untrained with an experienced firefighter (a buddy system) if the situation is unlikely to put the individuals or crew at risk

**When allocating tasks,** Fitness /skill  
**consider ...** Experience levels (new /old)  
 Selecting best person for task

**2. List the details of the Jobs to be Done**

eg	<b>Construct a fireline with hand tools</b>
	<ul style="list-style-type: none"> <li>• Identify the route to be taken</li> <li>• Clear a strip down to bare earth</li> <li>• Clear above ground vegetation with hand tools</li> <li>• Patrol the fireline to ensure that fire doesn't cross it</li> </ul>
	<b>Set up a portable pump and run a hose line</b>
	<ul style="list-style-type: none"> <li>• Identify the route and method of carrying equipment to operating site</li> <li>• Nominate the type of pump, type and amount of hose and waterway equipment required</li> <li>• Establish communications</li> <li>• Set up the pump and operate</li> </ul>

*Continued on next page*



## IAP Task Allocation and Briefing, Continued

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### 3. Allocate Tasks

- Match personnel competencies and physical abilities to the required tasks
  - Match personnel experience to the expected difficulties and hazards that may be encountered
  - Set reasonable work loads and time frame
  - Place less experienced personnel with more experienced crew members
- 

### 4. Distribute Equipment

- Distribute all of the equipment the crew needs for the tasks assigned to them (include the support materials e.g. sufficient fuel for the pump)
  - Ensure each person checks the equipment allocated to them to be sure it is complete and operative before going onto the fireline
  - Take care to avoid damage or injury when handling and transporting any equipment
- 

## Leadership

### Make Sure The Task Is Understood

Instructions must be clear and concise - a crew responds more readily to instructions that are easily understood. Check that the instructions are understood, that they are being carried out and ensure that the job is completed to the required standard.

### The following may help:

- Be sure an instruction is needed
  - Use the established chain of command
  - Learn to give clear simple instructions
  - Encourage the crew to ask if anything is not clear, or if they can contribute with information or advice
  - Ask if the crew understands the instruction
  - Watch to see that instructions are being followed, but not so closely that initiative is stifled
  - Make every possible means available to the crew to help with the task
- 

*Continued on next page*

## IAP Task Allocation and Briefing, Continued

<b>The IAIC must:</b>	
<ol style="list-style-type: none"> <li>1. Brief (see checklist overleaf) personnel and assign work</li> <li>2. Direct the suppression operation in a safe and effective manner</li> <li>3. Keep abreast of changing conditions that will affect safety and suppression effectiveness</li> <li>4. Adjust priorities and suppression action as needed to meet changing conditions</li> <li>5. Make provisions for an extended period of suppression operations</li> </ol>	
<b>Brief personnel and assign work</b>	As IAIC, brief and keep the crew(s) informed as to tactical actions and hazards, as well as other local factors and considerations affecting fire suppression.
<b>Direct the suppression operation in a safe and effective manner</b>	<ul style="list-style-type: none"> <li>• Use basic containment and suppression methods, either alone or in combination in accordance with fire authority requirements:</li> <li>• Good leadership and management practices ensure high performance in meeting goals and objectives</li> <li>• Direct the suppression resources to gain control of the fire with as little damage to the area as possible</li> </ul>
<b>Keep abreast of changing conditions that will affect safety and suppression effectiveness</b>	<b>Monitor:</b> <ul style="list-style-type: none"> <li>• Weather and environmental factors to anticipate changes in fire behaviour</li> <li>• Request spot weather forecasts as needed.</li> <li>• Fireline construction / containment progress</li> <li>• Condition/status of resources</li> </ul>
<b>Adjust fire priorities and suppression action as needed to meet changing conditions</b>	<ul style="list-style-type: none"> <li>• Base adjustments in tactics and deployment on current and anticipated conditions</li> <li>• Be prepared to be flexible</li> <li>• Base priorities on:               <ul style="list-style-type: none"> <li>• Potential threats to life, and property</li> <li>• Fire control standards</li> <li>• Total suppression job to be done</li> </ul> </li> </ul>
<b>Make provisions for an extended period of suppression operations</b>	If the fire cannot be controlled during the current work period, you, as the IAIC need to consider future incident management requirements.

- Remember** Always brief your crew(s) to ensure:
- That your tactical plan is implemented
  - That tasks are assigned to carry that out
  - That you ask for feedback from your crew(s) to enable you to carry out your role effectively

*Continued on next page*

# IAP Task Allocation and Briefing, Continued

**Checklist 1. Brief personnel and assign work**

<b>Fire Suppression Factors</b>	
	<b>Situation:</b> Extent of fire, values at risk
	<b>Objective:</b> What the intent of the operation is
	<b>Strategy:</b> Type of attack to be used (direct, indirect), Incident Action Plan
	<b>Tactics:</b> What will be used (hose lays, hand lines, machinery, aircraft, etc.)
	<b>Tasks:</b> Assignments and locations, resources
<b>Fire Environment and Fire Behaviour Factors</b>	
	<b>Weather:</b> Wind speed, wind direction, temperature, relative humidity, forecast
	<b>Topography:</b> Aspect, slope, terrain, chimney effects, barriers to fire spread
	<b>Fuels:</b> Fuel type, fuel burning, fuels ahead
	<b>Fire Behaviour:</b> ROS, flame heights, potential for alignment of wind, slope, aspect, and fuels, fire behaviour prediction, difficulty of control
<b>Safe Work Factors</b>	
	<b>Personal Safety:</b> Protective gear, heat (metabolic, radiant), smoke, practice LACES*
	<b>Safe Work:</b> Hand tools, power tools, machinery, unburnt fuel, uphill of fire
	<b>Communications:</b> Call signs, radio frequencies, Incident Control Point
	<b>Machinery:</b> Working distance from machinery / power tools, hearing protection
	<b>Aircraft:</b> Safe distances, approach vectors, loading, embarking, disembarking,
<b>Welfare Factors</b>	
	<b>Personnel:</b> Rest periods, drinking water availability, fluid intake, food, changeovers, fitness levels, lookouts, first aid

## Summary and Checklist

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### Briefings - Key points

- Inform crews and other resources
- Keep crew(s) informed as to tactical plan, known hazards, local factors and other considerations (ie. RFA policies and operational constraints) affecting operations management
- Assign tasks (implement tactical plan)
  - **What** has to be done
  - **Where** it needs to be done
  - **How** it is to be done
  - **Who** is to do it
  - **When** it is to be done by
- Ensure that personnel know and understand the principles for attack and safety procedures required
- Ensure that areas of local, natural, historical and cultural significance are recognized and protected
- Ensure that the general area of fire origin is protected

### Practical Safety briefing

- Apply LACES

### Hazard Management

OSH Requirements for hazard management require that the work place has been assessed and measures taken to identify, isolate, minimize or mitigate risk and that a hazard management plan is implemented.

- Note**
- Because of the volatile nature and the varying circumstances associated with rural firefighting it is not always practical to carry out a complete hazard assessment prior to commencing suppression operations, therefore it is essential that this process is ongoing through out the entire operations
  - The use of LACES is a means of addressing this requirement when a hazard management plan is not in place

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**Complete Exercise 9 in your Workbook.**

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# Containment and Control

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## Key Tasks

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**As the IAIC you are responsible for managing the incident and ensuring that the suppression action carried out is effective.**

This requires you to carry out a number of tasks that enable you to direct and maintain control.

### Key tasks

- Continue assessment of the fire
- Continue to delegate roles as the incident develops and resources arrive
- Continue to provide situation reports to the RFA
- **Monitor** to ensure safe and effective control action
- Manage resources so as to ensure containment and security of control lines
- Recognise on the job training opportunities
- Recognise the potential for the fire to escalate and transition to extended attack

### Setting priorities

- Safety considerations
  - LACES
  - Basic fire suppression skills
  - Hazards
- Values at risk
- Control portions of fire before anticipated weather changes
- Stop fire from getting into hazardous fuels or difficult terrain

### A little more on **Control line security**

- Burn out fingers and islands near line
- Cold trail inside fireline where appropriate
- Tear up and extinguish windrows and piles
- Fall spars near control lines
- Mop up inside perimeter for some distance.
- Use infrared heat detector (if available)
- Patrol lines, especially through heat of the day

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*Continued on next page*

## Key Tasks, Continued

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**In addition, you may be required to deal with a number of other factors as part of your role, eg:**

eg **Dealing with non-fire personnel at the fire**

- Local landowners and users
- News media
- Other fire protection and resource agencies
- Environmentalists
- Children or bystanders
- Aircraft traffic
- Land managers

**Treatment of incidents and injuries on a fire**

- Determine extent and seriousness of injuries
- Document incidents
- Request investigator for more serious accidents
- Ensure follow-up examination and/or treatment of all injuries
- Keep RFA informed

**Fire actions that may require consent**

- Non-routine actions on others lands
- Using heavy equipment
- Using retardant
- Requests from non-fire personnel
  - Land owners
  - Other individuals

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**Complete Exercises 10 & 11 in your Workbook.**

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## Constant Review - Monitoring



The IAIC must continually review decisions and facts as the conditions change (the task allocation & briefing responsibilities on page 50 continue into monitoring).

**Always consider the following:**

- **Size-up** (evaluate factors, weather probabilities)
- **Exposures** (fuel types, structures, values at risk)
- **Confinement** (topography factors and access)
- **Extinguishment** (resources and personnel available)

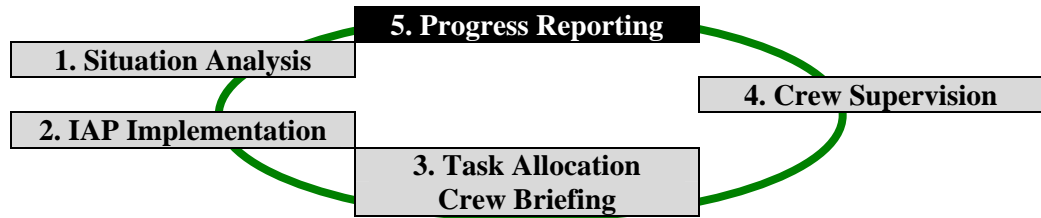
### Monitoring

- Inspect the entire **edge of the fire**, if possible - by going around the fire or finding a vantage point from which to observe its' behaviour
- **Monitor production rates** (fire suppression activities, helicopter control, machinery formed fire breaks, hand crew control operations) regularly to ascertain whether the operational effort is sufficient to meet control objectives
- Look for **fuel types burning**, look ahead of the fire and identify fuel types e.g. flashy fine fuels or heavy slow fuels
- Study the **topography**; natural barriers, slopes and shape of the land
- Assess **weather**, wind, temperature, RH, time of day and combined effect on the fire
- Examine the **danger points**, the most vital points of attack and where fire fighters can work safely
- If fuels, weather and topography are causing the fire to spread more rapidly than the ground crew(s) can control, consider the use of **aerial support** (retardants)
- Determine **danger spots** - where fire is likely to flare up
- Determine the most vital **point to commence the attack**
- Determine **safety** - remember the **10 Standard Fire Orders**
- Determine **fire cause** - look for and preserve evidence (**area of origin**)

# Reporting Progress

## Situation Reports

As part of the management of the incident, you need your Crew Leaders to report accurately on the situation and crew performance in the area for which they are responsible. Reporting is part of the ongoing communications process.



**Continue this 'Supervision Circuit' until the fire is out!**

Reports from each Crew Leader enable Fireline Management to build up a complete picture of the fire, the amount of fire suppression being achieved, and most importantly, any potential hazards and safety concerns.

<b>Report to</b>	IAICs will have their Crew Leaders reporting directly to him/herself as IC.	
<b>Report Content</b>	Name of Crew Leader Area involved Fuel Fire Behaviour Resources in use Resources required Suppression progress	Confirm location Topography Weather Values at risk Fire Control Status Condition of crew + equipment Any control problems
	Other information may be relevant depending upon the situation.	
<b>Report Frequency</b>	When the situation is stable, a report every <b>twenty minutes</b> may be sufficient. This ensures that the crew is not forgotten and provides a check that all is well. The IAIC may require reporting at more frequent reports. The frequency will depend on the rate that the situation changes or when a potential hazard exists.	

**Complete Exercises 12 in your Workbook.**



# Mop up and Patrol

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## Mop Up

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When the fire is contained mop-up needs to begin immediately and be carried out thoroughly.

**Re-kindling of the fire is a failure of mop-up**

### Key tasks

Mop-up may involve:

- Breaking-up of piles of burning material
- Removal of unburned material adjacent to the line
- Widening of the line
- Felling spars adjacent to the line
- Digging out of roots and stumps
- Spreading of embers
- Cooling of embers with dirt and/or water
- Knocking charcoal off; logs and stumps
- Removal/cooling of embers from base of unburned trees
- Burning-out
- Removing ladder fuels adjacent to line

Initially mop-up efforts should be concentrated on fire-brand producing hot spots along the fire perimeter.

As time permits, one can move further into the burned area.

Under no circumstances should smouldering material be covered and left under the assumption it will go out - it will not.

### Leaving a fire

Inspect fire area and analyse environmental conditions that could influence a reburn.

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## Fireline Rehabilitation

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**When the fire has been contained and made secure the area burned needs to be restored to as near its natural condition as possible.**

- Ensure that the fire area is clear of garbage, tools, and equipment
  - Follow up with the clearing and rehabilitation of fire lines and other fire affected areas as required by environmental needs, resource management legislation and Fire Authority policies
- 

### **Rehabilitation and cleanup**

- Dig waterbars on control lines on steep slopes
  - Rebuild or patch fences
  - Pick up litter
  - Scatter slash piles/windrows
  - Re-vegetate when necessary
  - Restore to natural condition – pull back bulldozed material over earth disturbance and remove any material deposited in water courses
  - Conduct suppression actions so as to cause the least damage
-

# Contingency Planning

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## Contingencies

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### **Planning for likely contingencies is part of an IAIC's responsibilities .**

This includes being able to recognise when a fire is not likely to be contained within a reasonable time frame.

### **These contingencies are likely to relate to:**

- Unforeseen events, eg. accidents, breakdowns etc
- An escalating situation, eg. resource deficiencies, environmental changes
- An escaped fire situation, eg. a fire run

### **In the event that a fire is not likely to be contained..**

...within a reasonable period of time (same day), planning for ongoing fire suppression operations involves input from the IAIC as they continue to manage that fire until relieved.

Situation reports (sitreps) need to be based on an accurate assessment of the current resources and productivity and include recommendations for future requirements.

### **Consider the following:**

- Evaluate the need for additional or replacement resources and make appropriate recommendations
- Provide information for an "escaped fire situation analysis"
- Priorities relevant to your sector for the interim period and the extended period
- Arrange for and/or incorporate incoming resources / personnel
- Prepare a "brief" for the in-coming personnel and ensure that you have complete and accurate records

### **Incident Complexity**

### **There are many factors that determine incident complexity:**

- Size, location, threat to life and property, fuel type, topography
  - Political sensitivity, organizational complexity, jurisdictional boundaries, values to be protected, organizational policies, etc
-

## Transition to Extended Attack

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### IA to Extended Attack and Handover of Control

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**Extended Attack**

*This section describes the key elements you need to manage during the transition period – prior to the passing of control of an incident from one person or organisation to another. (Handover)*

*This is the phase of an incident when initial attack capabilities have been exceeded.*

- This has historically been when the most **serious accidents** and **injuries** have occurred
- All planned actions must consider fire fighter and public safety as the number one priority

**Efficient handovers require planning by the IAIC**

**Efficient handovers**

Incoming personnel need to be briefed on their role by existing personnel who then depart as soon as the replacement assumes the role.

<b>The IAIC has a key role in this process through:</b>	
Ongoing monitoring and assessment	<ul style="list-style-type: none"> <li>• Situation monitoring and assessment</li> <li>• Fire behaviour and potential</li> <li>• Potential control problems</li> </ul> <p>These are vital to determine if the fire will be controlled within the initial attack period by the available resources.</p>
Handover of control...	<p>If a fire incident escalates in complexity through:</p> <ul style="list-style-type: none"> <li>• Large numbers of resources being deployed, or</li> <li>• Fire activity beyond the capability of current resources deployed</li> </ul>
..to another person or to an Incident Management Team (IMT) may be necessary	<ul style="list-style-type: none"> <li>• When incident complexity levels exceed initial attack capabilities, the appropriate CIMS positions should be added to the command and control structure, commensurate with the complexity of the incident</li> </ul>
	<ul style="list-style-type: none"> <li>• Extended attack actions can overwhelm an IAIC if specific CIMS organisational issues are not addressed at an early stage</li> </ul>
Useful tool	<ul style="list-style-type: none"> <li>• The Extended Attack Analysis will assist in determining the appropriate management structure to provide for safe and efficient fire suppression operations</li> </ul>

**Complete Exercise 13 in your Workbook.**

## Transition – Extended Attack Analysis – Typical Checklist

Yes	No	Safety
		Exposure of personnel to unusually hazardous conditions
		Multiple aircraft / helicopters involved / anticipated
		Potential for public evacuations
		Terrain adversely affects performance of fire suppression resources, limits safety areas.
		Personnel performance affected by cumulative fatigue
		Lack of cohesive organizational structure
Yes	No	Fire Behaviour
		Current or predicted fire behaviour indicates indirect strategy
		Fuels extremely dry and susceptible to rapid and explosive spread
		Extreme fire behaviour / blow-up potential exhibited
		Current or predicted winds above 16 km/h
		Fuel moisture of eight percent or below (FFMC >92)
		Severe fire weather conditions predicted
Yes	No	Personnel/Equipment
		25 or more personnel <b>or</b> more than 2 sectors <b>or</b> multiple agency incident
		Resource availability issues
		Variety of special support personnel or equipment assigned
		Personnel unfamiliar with local conditions and accepted tactics
		Heavy commitment of local resources to logistical support
		Communication ineffective with tactical resources or dispatch
Yes	No	Environmental
		Potential for numerous damage claims
		Sensitive public / media relationships
		Smoke management problems
		Structures threatened
		Cultural values
		Recreational developments
		Rural / Urban interface
		Critical municipal water supply watershed involvement
		Threatened and Endangered species
		<b>Total number of elements checked</b>

**If you check “YES” on 3 or more items, consider transition to an Incident Management Team.**

## Transition – Extended Attack Handover – Briefing Checklist

Yes	No	Incident Control
		Incident map
		Time and point of ignition
		Fuels – fuel type, fuel load, fuel condition – (dryness levels)
		Weather – (current and predicted)
		Topography
		Fire behaviour concerns
		Local hazards
		Initial Attack objective, strategy, and tactics
		Resources – deployed, available and enroute
		Fire Authorities and other organisations
		Current delegations and authorisations
Yes	No	Operations
		Safety issues / hazards
		Current objective, strategy and tactics
		Resources – deployed, available and enroute
		Current ground operations
		Air operations – aircraft deployed and enroute
Yes	No	Logistics
		Incident Control Point, Assembly Area and Staging Areas
		Communications
		Catering arrangements
		Traffic control
Yes	No	Planning
		Resources – deployed, available, enroute
		Time resources have been deployed
		Availability of maps, aerial photos etc.
		Current weather information
		Situation and incident predictions

## Transition - Handover checklists

### Handover checklists

	<b>Out-going IAIC</b>
	Prepare briefing to incoming IC or IMT (Incident has transitioned beyond Initial Attack phase)
	Advise subordinate staff re pending changes
	Brief replacement

	<b>In-coming IAIC</b>
	Sign in at Incident Control
	Receive IAP briefing
	Confirm handover time and location
	Establish contact with outgoing IAIC
	Receive fire update briefing
	Advise subordinate staff
	Take over command of fire

### Implications of Effective Handovers

#### Good handovers result in

<ul style="list-style-type: none"> <li>• Control</li> <li>• Good morale</li> <li>• Efficiency</li> </ul>	<ul style="list-style-type: none"> <li>• Safety</li> <li>• Performance</li> <li>• Unity of purpose</li> </ul>
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### Achieving Efficient Handovers

#### Some Guidelines

<ul style="list-style-type: none"> <li>• Handover timing</li> <li>• Prepare</li> <li>• Brief incoming</li> </ul>	<ul style="list-style-type: none"> <li>• Meals</li> <li>• Record</li> <li>• Location</li> </ul>
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## **Part 4: Getting the Job Done – Demobilisation and Administration**



# Requirements of Successful Demobilisation

## Introduction

As an IAIC you need to think through how to demobilise resources should you be successful in containing the fire.

- Demobilisation happens at all fires however small or insignificant the incident may be and often in the past, this process just happened and was not planned or organised
- It may also be a mixture of handover and demobilisation, e.g. The NZFS handing over to a RFA and standing down

**You are responsible for all equipment, supplies, and personnel assigned. There should be no equipment or personnel leave or enter the fireground unless planned for and authorized.**

It's important to get into a routine of planning for demobilisation and follow the procedures at all incidents, irrespective of size or complexity.

**The IAIC may have some flexibility in determining release of resources.**

Some general guidelines to follow are:

- Release resources by predetermined criteria and priorities
- Administrative requirements
- Performance evaluations

### **Release resources by predetermined criteria**

- Work progress
- Suppression priorities – resources may be needed elsewhere
- Travel time from fireline to assembly area
- Transportation arrangements
- Length of assignment (who goes first?)
- Employment award requirements
- Cost – most expensive resource released first
- Crew Leaders to be de-briefed before leaving

### **Performance evaluations**

Complete, honest and accurate. Discuss with directly reporting personnel.

- Firefighting techniques
- Production outputs
- Team work
- Safety habits
- Training needs
- Written appraisals
- Portfolio of evidence (competency assessments)

**Complete Exercises 14 in your Workbook.**

## Part of the Job - Administration

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**It's paramount that all information provided is clear and precise.**

- Where needed, provide this key information in a written format (including the use of maps) to ensure that information is not lost and or misinterpreted.
- Carry out this transfer of information in a timely manner. This ensures that notice of an event likely to occur or an action required is received in adequate time for any counter measures to be undertaken.
- Pass this key information on to the person required to make it happen

**What happens when key information is not passed on in a timely manner to the person required to make it happen?**

- The chances of something being overlooked and not actioned increase dramatically. Don't assume that someone else will think of it for you.
- Last minute requests increase the likelihood of that request not being actioned for the time required.

**Remember: ASSUME makes an ASS out of U and ME!**

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## Resource Monitoring

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- It is essential that all resources involved with the incident are accounted for during the entire process of ordering, transportation, assembly area, staging area, use on the fireline and return to the provider
  - Personnel must not be involved for excessive hours. This includes ensuring that individuals have not exceeded a reasonable duration of "being awake" time prior to being involved at the incident.
  - The "T card" system is a method of achieving this. Fireline supervision includes being held accountable for tracking and recording of all resources during the period that they are allocated to the sector.  
You can view a presentation on the use of T Cards at [www.nrfa.org.nz](http://www.nrfa.org.nz) then Incident Mgmt. Forms.
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## Administrative Information

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**We use administrative information to account for fireline activities which require the retention of details:**

- Maintain records of personnel present (timesheets, competency assessments etc)
- Record details on any injuries and/or accidents and/or damage to equipment
- Maintain records of contracted resources and their time in use

**What is required varies with the nature, size and complexity of the incident, but normally includes:**

<b>Timesheets</b>	<ul style="list-style-type: none"><li>• Personnel</li><li>• Equipment and machinery (hours, ownership)</li></ul>
<b>Accidents</b>	<ul style="list-style-type: none"><li>• Personnel</li><li>• Equipment</li></ul>
<b>Resource monitoring</b>	<ul style="list-style-type: none"><li>• Vehicles (kms, hrs)</li><li>• Aircraft (hours, loads, ownership)</li><li>• Damage details</li><li>• Fuel</li><li>• Retardant</li><li>• Suppression</li><li>• T- cards</li><li>• DTRs</li></ul>

For administration form templates, see [www.nrfa.org.nz](http://www.nrfa.org.nz) then Incident Mgmt. Forms.

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## Resource Readiness

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**After the suppression operation has been completed all suppression resources need to be made ready for re-deployment**

This may include:

**Reconditioning or refurbishing tools and equipment**

- Use equipment inspection forms

**Organisational Readiness procedures**

- Local policy on rest and readiness
- Rotate personnel on call
- Rotate job assignments
- Make recommendation for rest
- Tag and report broken equipment
- Report unsafe vehicles & request repairs

**Fuel and load vehicles for next assignment**

**Complete Exercises 15 & 16 in your Workbook.**

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**Part 5: After the Job is Done – Post Fire Analysis**

## Responsible to Debrief

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A Post Fire Analysis provides an opportunity to evaluate the practices and procedures involved and to make recommendations for improvement when necessary. This is usually done by way of debrief.

### Your role in the debrief as an IAIC is to provide information on:

1. What went well?
2. What didn't go so well?
3. Recommendations for improvement

### You may need to complete a fire analysis and report on each of the following:

- Were all **RFA policy requirements** met satisfactorily?
- What were the consequences of **management decisions** made on the fire?
- How effective were **suppression resources and strategies**?
- What is your evaluation of **personnel and equipment**?
- Was **Fire Behaviour** accurately assessed and responded to in a timely manner?
- Individual qualifications and training needs – were the right people in the right jobs? What, if any, gaps were there? Were the gaps resource, process or skill based? ie – is it a training need or something else?

What are your information sources?

- Note book recording key messages from verbal correspondence
- Map(s) of area
- Copies of your briefing notes
- Copies of your “sitreps”
- Copies of the sector assignment(s) and briefings from the IAP
- Other?

What's the purpose of a debrief?

*The debrief should clarify policies, identify problems and provide solutions for events which occurred at the fire.*

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# FIRE CREW TASK FORM

This Crew Task Form is used in some parts of NZ.

Your name is: \_\_\_\_\_

Your position is: \_\_\_\_\_

You will be located at: \_\_\_\_\_

Your radio callsign is: \_\_\_\_\_

Your radio channel/frequency is: \_\_\_\_\_

You are responsible to and report to: \_\_\_\_\_

You are to report every \_\_\_\_\_ OR if the situation changes

Their position is: \_\_\_\_\_

They are located at: \_\_\_\_\_

Their radio callsign is: \_\_\_\_\_

You are responsible for (Names Of Your Crew):

_____	_____
_____	_____
_____	_____
_____	_____

Your task is to: \_\_\_\_\_

_____
_____
_____
_____

Equipment you will need is: \_\_\_\_\_

_____
_____
_____

Site specific hazards for this incident are:

Understood and signed by Crew Leader/Supervisor: \_\_\_\_\_

**LACES - WATCHOUTS - FIRE ORDERS - ON REVERSE OF FORM**

# Draft Course Timeline and Assessment

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<b>0830 – 0900</b>	Introductions / Course Objectives
<b>0900 – 0930</b>	(Getting the Job Done) Planning <ul style="list-style-type: none"><li>• RFM Handbook and fire behaviour</li></ul>
<b>0930 - 1030</b>	Safety video clips and flashcards
<b>Morning Tea (1030 – 1045)</b>	
<b>1045 -1230</b>	Fire Exercise: Part I – Respond, Size up, Action <ul style="list-style-type: none"><li>• Introduce scenario, use sandtable etc</li></ul>
<b>Lunch (1230 – 1300)</b>	
<b>1300 – 1400</b>	Fire Exercise: Part 2 – IAP
<b>1400 – 1500</b>	Fire Exercise: Part 3 – Re-assessment
<b>Afternoon Tea (1500 - 1515)</b>	
<b>1515 – 1630</b>	Fire Exercise: Part 4 – Transition
<b>1630 – 1700</b>	Course review – any issues from Parking Lot
<b>1700</b>	Course Evaluation / Closure

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## Assessment

**Group** • Each group needs to work together on the exercises

**Individual**

- Each participant will need to take turns leading the group, delivering briefings /reports back to the group and/or Comms Centre as required in the course exercises
- Each participant will need to satisfactorily complete and hand in all written exercises
- The Student Note exercises are part of the assessment (completed and submitted prior to course)

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## Further Reading

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These notes are taken from the Referral Notes.

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### Summary of key principles of Machine Line Construction

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- You need to be able to weigh up *rates of line construction* and *rate of fire edge (perimeter) growth* with achieving maximum productivity from the resources and minimising damage
- You must also be able to secure the line that has been constructed

#### **What is the key knowledge required by fire management personnel?**

- Fire behaviour prediction, and especially perimeter growth rate
- Control line construction rates by specific firefighting resource
- The lead times for arrival resources and their becoming operational on the appropriate part of the fire line

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*Continued on next page*

# Summary of key principles of Machine Line Construction,

Continued

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<b>The location for fire control purposes must take precedence.</b>	<ul style="list-style-type: none"><li>• Often it is practical and desirable to build the fire line where it will serve as an access for fire trucks, crew vehicles and for later patrols</li></ul>
<b>All fire lines must be constructed from a safe anchor point</b>	<ul style="list-style-type: none"><li>• This ensures that the fire cannot creep round the fire line from behind. Formed roads are excellent safe anchor points</li></ul>
<b>The fire line should be built at or near the fire edge.</b>	<ul style="list-style-type: none"><li>• In some instances the machine might be used on very small fires to push the burning edge into the fire area all the way around the perimeter</li></ul>
<b>Where both soil and debris must unavoidably be pushed to the inside</b>	<ul style="list-style-type: none"><li>• If possible spread and scatter this material well back into the burn area</li></ul>
<b>As a general rule, scatter all material.</b>	<ul style="list-style-type: none"><li>• In many situations it pays to have an observer with the machine to assist with changing blade angle or rope pulling</li><li>• All unburned fuels should be pushed away from the fire line and scattered to the extent possible</li></ul>
<b>In fuel types with downed trees or timber</b>	<ul style="list-style-type: none"><li>• You may need to have a chainsaw crew go ahead of the lead machine to cut the material – chainsaw crews need to:<ul style="list-style-type: none"><li>• Be trained and safely equipped</li><li>• Be closely supervised</li><li>• Be kept well ahead of the machine</li><li>• Avoid doing work that the machine can do</li></ul></li></ul>
<b>Kegs/spars can be quickly felled by dozers</b>	<ul style="list-style-type: none"><li>• When kegs/spar felling is dangerous to machines, the job should be done by felling crews</li><li>• Use best practice for the job</li></ul>
<b>Downslope</b>	<ul style="list-style-type: none"><li>• Make sure no one is working downslope from machinery</li></ul>
<b>Steep terrain</b>	<ul style="list-style-type: none"><li>• Consult with operator before assigning a machine to work in steep terrain or contouring side slopes</li></ul>
<b>Safety</b>	<ul style="list-style-type: none"><li>• Remember the 2 tree length rule</li></ul>

# Bulldozer Production Rates

## Bulldozers Production Rates

Production rates decrease as the fuel loadings increase.

- Key points**
- Slope has an effect on production rates, especially when traveling up-slope
  - Some bulldozer sizes are better suited for certain jobs than others
  - Line location is important. The general principles of width, depth and location apply
  - Locations where dozers cannot work effectively should be avoided
  - Avoid concentrations of heavy fuels - take advantage of light fuel areas to speed progress
  - Keep fire lines as straight as practicable

## Productivity

Bulldozer productivity correlates directly with the amount of material to be removed and the power output of the machine.

### Determining Factors

<b>Primary factor that determines fireline productivity</b>	<ul style="list-style-type: none"> <li>• Is <i>fuel resistance</i> to fireline construction, eg Canopy trees</li> <li>• Machine size</li> </ul>
<b>Other factors that contribute include:</b>	<ul style="list-style-type: none"> <li>• Understory vegetation</li> <li>• Soil conditions</li> <li>• Topography</li> </ul>

### Resistance to construction can be categorized into four classes

<b>Low resistance</b>	<ul style="list-style-type: none"> <li>• Grasses– with shallow organic layers &lt; 12cm</li> <li>• Scrublands and regeneration without stumps</li> <li>• Juvenile pine stands without stumps</li> </ul>
<b>Moderate resistance</b>	<ul style="list-style-type: none"> <li>• Grasses– with organic layers &gt; 12cm</li> <li>• Dense scrubland and regeneration</li> <li>• Juvenile pine stands with stumps and residual slash</li> <li>• Old pine slash areas with organic layers &lt; 12 cm and where stump removal does not greatly slow production</li> <li>• Mature pine forest with well spaced trees</li> </ul>
<b>High resistance</b>	<ul style="list-style-type: none"> <li>• High density native regeneration and immature pine forest</li> <li>• Recent pine slash areas with light slash and well spaced stumps</li> </ul>
<b>Extreme resistance</b>	<ul style="list-style-type: none"> <li>• Recent slash areas with large volumes of slash</li> <li>• Mature pine forest with closely spaced trees</li> <li>• Old indigenous bush</li> </ul>

*Continued on next page*

## Bulldozer Production Rates, Continued

Resistance Class	Metres/kW/Hour	Resistance Class	Metres/kW/Hour
Low	4 - 6	High	1.0
Moderate	2.0	Extreme	0.5

Hourly production can be estimated by multiplying the above values by the kW rating for a particular machine.

e.g.

A machine of 104 kW working in low resistance vegetation will produce about 420 to 620m of line per hour, whilst if working in high resistance vegetation it would produce in the vicinity of 50 - 60m of line per hour	On the other hand a large machine of 224 kW will produce around 900 – 1350m and 110-130m per hour respectively
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These rates (above) are applicable for flat ground. Slope will impact upon productivity as a percentage of flat ground rate.

e.g.

<b>Slope</b>	+ 30%	+ 20%	+ 10%	0%	- 10%	- 20%	- 30%
<b>Rate</b>	50%	65%	80%	100%	115%	125%	115%

### Slope guidelines: Maximum slope guidelines for dozers

Downhill	75%	Uphill	55%	Side hill	45%
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### Rule of thumb

It's best to work bulldozers in pairs so that they may assist and reinforce each other.

- More than 2 dozers working together is seldom practical
- The lead dozer pioneers the line by doing the rough clearing job - this dozer is the largest machine or the one in the best condition
- The second dozer cleans up the line

**Caution**

- Neither machine should be operated below the other on slopes because of the danger of rolling and falling material
- They should not work too close together (2 tree length rule)

The line may be wider in some sections than in others depending on the job it is intended to do.

- There must be a reason for extra width of line – eg. the scrub is tall and thick
- The line should be wide enough to hold the fire, usually not less than one half the height of the fuel

Use a clean-up crew behind the dozer to speed up the line construction and to make it secure.

*Continued on next page*

## Bulldozer Production Rates, Continued

Approximate Conversions for Slopes					
Ratio/Percent Conversions					
1:1	=	100%	1:6	=	16.5%
1:2	=	50%	1:7	=	14%
1:3	=	33%	1:8	=	12.5%
1:4	=	25%	1:9	=	11%
1:5	=	20%	1:10	=	10%

Slope Degrees / Slope Percent Conversion Table													
Ratio	1:10		1:5			1:2					1:1		
Percent	0	10	20	30	40	50	60	70	80	90	100	120	140
Approximate Degrees	0	6	11	17	22	27	31	35	39	42	45	50	55

Equipment capabilities for mop-up and rehabilitation work						
Equip Type	Mop Up			Rehabilitation		
	Push over spars	Turn logs	Break up piles	Open deep smoulder	Water barriers	Pull spoil back
<b>Dozer</b>	✓	✓	✓		✓	✓
<b>Skidder</b>		✓	✓			
<b>Excavator</b>	✓	✓	✓	✓	✓	✓
<b>Grader</b>					✓	✓

## Bulldozers and Fireline Construction

<b>Comparisons of bulldozers used for fireline construction</b>				
<b>Make</b>	<b>Size</b>	<b>Weight (tonnes)</b>	<b>Power Output (kW)</b>	<b>Horsepower</b>
<b>Large dozers (Type 1)</b>				
Caterpillar	D-9H	42	287	
Caterpillar	D-8K	30	224	
International	TD-25C	30	213	
International	TD-25G	35	239	
Komatsu	D-155A	34	239	
<b>Medium dozers (Type 2)</b>				
Caterpillar	D-7G	25	149	200
Komatsu	D-85E	23	164	
Terex	82-30B	27	194	
Terex	82-20B	20	153	
Fiat Allis	HD-21B	25	204	
<b>Small dozers (Type 3)</b>				
Case	1450	13	104	
Caterpillar	D-6D	14	104	
International	TD-15C	14	104	
John Deere	JD-850	13	104	
Komatsu	D-65E	16	120	
Fiat Allis	HD-11B	16	104	