IFE Level 4 Certificate in Fire Science and Fire Safety (HL)

Unit 3: Fire Service Operations and Incident Command

Unit Reference Number: H/505/5933

Introduction

This unit focuses on the strategies and activities required to assess and resolve fire and rescue incidents. It reflects the breadth of knowledge and understanding required by an Incident Commander operating at tactical level. It covers incident management as well as technical expertise and post-incident de-briefs and reviews.

Learning Outcomes

Candidates who achieve this unit should be able to:

- assess incidents and determine appropriate strategies to resolve them
- understand the issues to be taken into account in reviewing and determining incident status, assuming responsibility and taking over command and control operations
- understand how to deploy firefighting equipment and other resources
- understand how to preserve the safety of firefighters and members of the public
- assess and develop policies and procedures

Unit Status

Optional

Content

1. Pre-planning

Assessment Objective	Knowledge, Understanding and Skills

1.1 Evaluate the purpose of pre-planning and inter agency liaison for all emergency incidents and assess the pre-planning requirements for any specified emergency	• Incidents to include:
	  ○ All fire situations
	  ○ All Rescue situations
	  ○ Major incidents and incidents involving civil disturbance
	  ○ Acts of terrorism and natural disaster
	  ○ Incidents involving hazardous materials
	• Information gathering on risks and data capture from predictive modelling such as weather forecasts, tides and seasonal risks in forestry areas,

	etc. • The safety of all emergency responders, non-emergency personnel working alongside and members of the public, including bystanders • The mitigation of environmental impact • Calculations with regard resources, equipment and personnel • Liaison with other agencies, key site personnel, responsible persons, government representatives and other external partners/stakeholders • Conformation with legal requirements • Working to meet policy and organisational objectives
1.2 Evaluate training requirements and assess activities to ensure that personnel remain competent in role	• Definition of occupational competence • Organisational responsibilities • The planning of training and development and its implementation, to include: o Training needs analysis o The planning and evaluating training activities within the work place o Assessing strategic performance in line with organisational targets o The involvement of Multi agency, Partners, Stake holders in strategic planning • Controlling risk, to include: o Suitability of training venues, use of equipment, personal protective equipment and emergency arrangements o Management of training and development events and activities

2. Incident Command and Management

Assessment Objective	Knowledge, Understanding and Skills
2.1 Evaluate the key roles within a command structure and assess the level of responsibility and limits to authority	• The role and responsibilities of the Incident Commander at Tactical/Strategic level and limits to authority • The performance criteria involved in leading, monitoring and supporting people to resolve operational incidents • The role and responsibilities of Command Support at Tactical/Strategic level incidents, including the role of Command Support Officer • Liaison and working with multi agency response, local government and stakeholders at Tactical/Strategic level
2.2 Assess and evaluate the importance of successful leadership and the application of effective decision making during operational incidents	• The need for effective decision making • How to select and apply a range of tactics and strategy to resolve different types of operational incidents

	• The term 'situational awareness' and its relevance to the role of Incident Commander • The key elements of leadership within the role of Incident Commander • Awareness of when to work outside of policy • Effects of decision making on business continuity, recovery and restoration of normality
2.3 Assess and evaluate the principles of successful risk management at operational incidents	• The key points in minimising and controlling risks to operational personnel • The relationship between the analytical risk assessment process and the safe and effective management of risk at operational incidents • How to identify and control risk appetite
2.4 Assess and evaluate the benefits of inter-operability and the contribution of other agencies to the provision of specialist advice and support	• The need for effective liaison with other agencies to achieve desired outcomes • The provision of information to other agencies which may assist in their decision making • The benefits of inter-operability in obtaining and acting upon specialist advice and support from other agencies
2.5 Explain and assess the principles of command and control, tactics and strategy necessary to resolve emergency incidents	• Objectives of ventilation at fires and describe in detail the principles involved • Strategy and tactics involved in rescue work and how they are used in practice to accomplish efficient rescues • Procedures for ensuring the safety of both personnel and public • The need for evacuation at fires, emergency incidents and major disasters and discuss how this can be achieved • Firefighting procedures and tactics in fires involving hazardous materials including hazmat identification systems and hazard tactical systems • Inter-relationship of logistics operations and technical support at incidents • The implications of establishing a successful media communications strategy at developing incidents • Aims of salvage/damage control operations and the principles and technicalities involved
2.6 Explain how to deploy equipment and other resources to resolve incidents including fires and other emergencies	• Different types of firefighting media and equipment and its operational use • Selection and deployment of resources • Capabilities and limitations of personnel, appliances, special appliances and equipment • Use of specialist advisors and teams

2.7 Evaluate the communication systems available both at incidents and remotely	• Importance of effective communication in recognising poor or inaccurate information and taking action to rectify • Types and methods of communication available to an Incident Commander • Implications of the need to communicate with multi agencies at large incidents • Range of mobile data terminals and remote information sources available • Role of Command Support in establishing effective communications at incidents • Requirement to ensure timely and regular briefings that involve relevant agencies and individuals

3. Fire and Rescue Procedures – Tactics and Strategy

Assessment Objective	**Knowledge, Understanding and Skills**
3.1 Evaluate and assess organisational compliance to relevant national legislation	• Personal responsibilities under relevant national legislation • Operational responsibilities under national or government legislation • Legal, moral and financial consequences of none compliance
3.2 Evaluate fire development in relation to the tactics and strategy employed for extinguishing fires in different contexts.	• The identification of different types of burning material and the effects on building construction • Interruption to business continuity and implications on infrastructure • Ways in which fires can spread detected and undetected both internally and externally • Principles and application of ventilation • Flashover, backdraught and fire gas explosion
3.3 Evaluate the tactics and strategy along with the specialist techniques required when dealing with fires that occur in different contexts. *(Note: further amplification of the range of situations is provided in sections 5 and 6 below.)*	• Fires in the built environment, to include fires in: o buildings under construction and demolition or derelict o high rise properties or buildings with atriums, basements and tunnels o leisure facilities, camp sites and temporary structures o waste sites (including renewable energy facilities) o retail and leisure facilities o commercial premises and industrial/petrochemical processes o hospitals, health care and educational establishments o prisons and places of lawful detention o places of research and laboratories o premises used for the generation, distribution, storage or supply of gas, LPG, electricity, solar panels and other sources of power

	○ historical buildings and premises containing valuable artefacts including Heritage buildings, museums and galleries • Fires involving transportation by road, rail, air and waterways, to include: ○ modes of transportation, ie vehicles rolling stock, aircraft and vessels ○ infrastructure, such as roads, terminals, stations, docks, marinas, etc. • Wildfires, to include: ○ Rural areas such as forests, heath land, wildland, crops, bush, etc ○ Farms, farm buildings, processes and equipment
3.4 Evaluate the benefits of salvage operations and controlled burn strategies	• Salvage considerations to prevent avoidable damage and mitigate the effects of fire and firefighting operations • Subsequent effects on business continuity, recovery, community impact and restoration of normality • Environmental, community and business impacts of control burn strategies
3.5 Evaluate the tactics and strategy along with the methodologies of both general and specialist rescue operations in different contexts. *(Note: further amplification of the range of situations is provided in sections 5 and 6 below.)*	• Rescues from the built environment, to include: ○ entry into and searching of buildings and collapsed structures ○ release of trapped persons from machinery, lifts, escalators • Rescues from sub-surface and confined spaces, to include: ○ entry into and searching of tunnels and shafts ○ vat, silo, sewer, trench, pit, chimney • Rescues from transportation incidents, to include: ○ extrication of persons from vehicles, trains, aircraft, ships and boats • Rescues from height, to include: ○ working at height or with ropes including: ○ buildings, cranes, shafts, cliffs and other permanent or temporary structures • Rescues from water and unstable ground to include: ○ people, property and vehicles from flood water ○ incidents involving still and fast flowing water ○ incidents involving ice, mud and other free flowing solids • Large animals and humanitarian rescues • Rescues from incidents involving hazardous materials, to include: • Hazmat release by defect, natural occurrence, or human act.
3.6 Evaluate the tactical response and strategic objectives of dealing with	• Incidents involving: ○ high level terrorist threats or acts, including

terrorist related incidents and civil unrest.	release of chemical, biological, radiological, nuclear contamination. ○ explosive devices such as Improvised explosive devices or suicide bombings ○ marauding firearm attacks ○ low level threats or acts from groups making protestations. • Major incidents and civil disturbances
3.7 Evaluate the health and safety management protocols required and the environmental protection considerations when dealing with operational incidents in different contexts. *(Note: further amplification of the range of situations is provided in sections 5 and 6 below.)*	• Fires/Rescues in the built environment • Fires/Rescue involving transportation by road, rail, air and waterways • Wildfires • Fires/Rescues involving hazardous materials • Rescues from sub surface and confined spaces • Rescues from height • Rescues from water and unstable ground • Large animals and humanitarian rescues • Environmental conditions and severe weather such as flooding, high winds, and extremes of temperature

4. Post-Incident Action

Assessment Objective	Knowledge, Understanding and Skills
4.1 Evaluate the principles and the value of debriefs, applying these principles to different contexts	• How to conduct post-incident debriefs held at the appropriate level dependant on the type and scale of the incident • How to facilitate debriefs through open and constructive discussion and review • How to gather and review all relevant information from internal and external sources • How to implement remedial measures to improve future practice and performance • How to identify trends and their implications on future practice and performance • The feedback process involved to rectify organisational strategic issues
4.2 Evaluate the effects and consequences of incidents	• Indirect socio-economic consequences of fires, other emergency incidents and major disasters • Environmental effect and control measures in relation to fires and emergency incidents • Legal responsibilities and the potential for organisational change • Financial costs and litigation issues • Critical incidents and ongoing emotional/welfare support of employees
4.3 Evaluate the principles of carrying out investigations along with determining the requirements for scene preservation, the collection of	• Further investigation to include: ○ Fire Investigation ○ Fire Safety Investigation ○ Health and Safety Investigation

evidence and all post incident actions	○ Criminal Investigation ○ Internal Investigation • Investigative techniques of emergency incidents and major disasters • Collation of factual information and the preparation of documents to present at formal proceedings such as post mortems, public and judicial enquiries • The involvement of external agencies and legal compliance

5. Incidents involving Buildings

Assessment Objective	Knowledge, Understanding and Skills
5.1 Assess how a fire or collapse situation has compromised a building's integrity or stability, determine the hazards present and the implications for firefighting and rescue operations on the incident ground.	Building methods to include: • Framed and unframed buildings • Steel and concrete frame • Concrete construction methods • Composite and Modular construction • Portal frame and Glulam construction • Claddings and fixing methods • Staircases • Roofs, ceilings and roof lights • Flooring and fixing methods • Doors and windows • Non load bearing walls and partitions Elements of structure include: • Columns and Beams • Load bearing and compartment walls • Floors and frames • Enclosed protected shafts and staircases
5.2 Assess the implications of building facilities in relation to fire spread and firefighting/rescue operations.	Building facilities to include: • Heating and air conditioning systems • Ventilation and smoke handling systems • Stairwell and pressurisation systems • Lifts and escalators • Service utilities such as electricity, gas, oil and water
5.3 Assess the design features of fixed installations and how they may be utilised to progress firefighting operations and assist in business continuity	Fixed installation to include: • Sprinkler, drencher and water spray projection systems • Rising mains, falling mains and hose reels • Foam and flooding systems including gas/vapour and dry powder systems • Automatic fire detection and alarm systems • Communication and security systems

6. Incidents Involving Transportation

Assessment Objective	Knowledge, Understanding and Skills

6.1 Assess the principles of construction of ships/boats and assess the hazards and actions that should be considered when working with ships/boats and marine infrastructure	• Design and construction of ships including:
	  ○ General cargo
	  ○ Container
	  ○ Chemical and gas carriers
	  ○ Bulk carriers
	  ○ Passenger vessels including liners
	  ○ Warships
	• Hazards and risks when working:
	  ○ Alongside waterways, docks, harbour and marina infrastructure.
	  ○ On or with ships and boats
	• Measures incorporated into ships to assist firefighting and provide fire protection
	• Concept of buoyancy and procedures for ensuring stability during firefighting operations
	• Factors relevant to ship firefighting both in ports and at sea

6.2 Assess the principles of construction in relation to railway systems and assess the hazards and actions that should be considered when working with railways and rail infrastructure	• General features of railway networks and infrastructure
	• Types, design and construction of trains and rolling stock
	• Hazards and risks when working:
	  ○ Alongside railway lines, sidings and at other rail premises.
	  ○ On or with trains and rolling stock
	• Rail and train power systems
	• Identification of freight including signage of goods and information retrieval systems
	• Firefighting and emergency procedures for railway incidents

6.3 Assess the principles of construction in relation to all types of vehicles and assess the hazards and actions that should be considered when working with vehicles and on roadways	• Vehicle design, to include:
	  ○ motor cars,
	  ○ light and heavy goods vehicle
	  ○ Buses and coaches
	  ○ Unconventional and specialist vehicles
	• Hazards and risks when working:
	  ○ On roadways and motorways
	  ○ With vehicles including cars, LGV's and specialist vehicles.
	• General features of road networks
	• Identification of freight including signage of goods and information retrieval systems
	• Fuel systems, materials involved in vehicle construction and supplementary restraint systems.

	• Firefighting and emergency procedures for incidents on roadways

6.4 Assess the principles of construction of aircraft and assess the hazards and actions that should be considered when working with aircraft and at aerodromes	• Design of aircraft to include:
	  ○ Civil and military aircraft
	  ○ Passenger and freight aircraft
	  ○ Both fixed wing and rotary wing aircraft
	• Hazards and risks when working:
	  ○ At aircraft crash sites both on and off an aerodrome
	  ○ With civil and military aircraft, including fixed wing and rotary wing aircraft
	• Firefighting and emergency procedures for incidents involving aircraft and/or airports