Directive 3.5 – Bushfire

SOP 3.5.9 –Firefighting within Rural-Urban Interface RUI Environments

Download Field Guide

Introduction

1. This SOP provides the consistent strategies and terminology for management of fires within Rural-Urban Interface (RUI) environments. The Interface is defined as: the line, area or zone where structures and other human development adjoin or overlap with undeveloped bushland. These environments can include, and not limited to any area or zone where structures and other elements of the built environment intersect bushland, farmland, plantation, parkland or other vegetated land. (AFAC 2016)

The principal focus of this SOP is guidance towards control and suppression of fire at RUI environments, while managing public safety and protecting the built environment and other critical assets.

Interface firefighting presents additional challenges for fire services. The risks associated with fire management for the public and fire service personnel are further compounded by complex fuel arrays mixed with a higher density of assets and people. Contained within this SOP is a nationally consistent approach to interface firefighting strategies and its associated terminology.

2. **Types of interface.** Defined by their characteristics, the three main different types of RUI environments include:

- **Classic Interface**: The distinct border between the natural landscape and its vegetation typically found on the edges of cities, towns and suburbs that could include residential or industrial developments.

- **Mixed Interface**: Typically found within rural and semi-rural settings where isolated properties or structures are surrounded by vegetation. These at risk structures could include residential farm houses or rural lifestyle accommodations, agricultural infrastructure such as processing/manufacturing facilities, grain storage, sheds and stables. Mixed interface also includes any critical infrastructure subject to fire risk due to surrounding vegetation.

- **Occluded Interface**: Areas of vegetation surrounded by development, examples include reserves, sanctuaries, water catchments, remnant natural vegetation and recreation parks within township or development boundaries. These are commonly referred to as Urban Bushlands.

Principles

2. **General.** With the emergency management arrangements in Western Australia having adopted risk management principles of Prevention, Preparedness, Response and Recovery (PPRR), a number of prevention and preparedness activities can improve the success of response during interface incidents. Activities such as fuel management, community education, employing mitigation initiatives and pre-incident planning, based on a shared responsibility approach with a range of stakeholders, will assist in the development of firefighting objectives, strategies and tactics within each interface type.

3. **Response** Incident Controllers (IC) should issue a clear statement of intent to inform firefighters, other emergency management partners and the public about incident priorities, including life safety protection priorities and firefighting strategy. All firefighting strategies including interface fires will have developed objectives and strategies developed by the Incident Management Team (IMT) based upon the State Strategic Control priorities.

Protection and preservation of life is always the highest priority when considering the appropriate strategic roles and actions for emergency management response, even where there are concurrent risks or competing priorities.

4. **Strategies** Crews involved in tasks in RUI environments, must be able to quickly deploy into standard bushfire offensive and defensive positions. Due to the complexity of the RUI environment and the number of firefighting resources deployed to some incidents, the following strategies and their terminology will need to be considered and understood.

Offensive: This strategy includes the traditional tactics of direct, parallel and indirect attack that may be used when the objective is to minimise fire size and where the probability of success of suppression using this strategy is high. When fire behaviour allows, and this is usually when the fire danger index (FDI) is below 50. By definition, fires burning under these conditions can be controlled, albeit sometimes with difficulty.

Defensive: When fire conditions are such that offensive strategies are too dangerous or are likely to fail due to fire intensity, fuel loading, structure defendability or insufficient resources, the following operational tactics individually or simultaneously can be applied;

- **Line defence**: The protection of assets by direct firefighting operations preventing the impact from fire, yet allowing the rest of the fire to burn around the structure. Employed In lieu of an offensive attack due to limited resources being available or due to a direct attack failing due to a number of fire behaviour assessments.

- **Ember defence**: The protection of assets threatened solely by ember attack, when approaching a line of fire is too intense to be suppressed by offensive means and is producing significant ember attack from fire brand. Spot fires only are extinguished that threaten further fire development that could cause structural involvement.

- **Backstop defence**: Retreating to a safe zone due to fire intensity, allowing the fire to moderate, before returning to adopt active firefighting to safely and effectively defend or extinguish structures. If there is no defendable space around the asset or structure, to ensure crew safety, appliances should withdraw a short distance to a safety zone until the fire danger has moved through.

Safeguarding Strategy: Employed when even defensive operations are deemed unsafe due to catastrophic fire conditions. During a safeguarding strategy, firefighters' actions are limited to a **WARN, MOVE** and **PROTECT** any persons who are under direct fire threat.

- **WARN:** people about the imminent impact from fire through timely public warnings and firefighters on scene,
- **MOVE:** advise people to move to safe locations, this may require fire fighter intervention.
- **PROTECT:** when moving people to a safer location is no longer an option, provide protection in whatever form is possible and safe in the circumstances.

5. **Tactics** It is important to understand that bushfire fighting tactics do not vary from traditional methods taught within DFES. The tactics differ when crews are developing safe firefighting positioning during structural defensive activities. These are outlined within Annex A**,** and can also be found with various rural learners manuals.

6. **Aerial suppression response.** Aerial firefighting can be crucial for successful outcomes within the above strategies within interface environments. On request by the IC, air operations support firefighting by improving crew and public safety, providing asset protection and assisting in reducing fire behavior, its intensity and rate of spread.

SOP 3.11.1 – Aerial Suppression Response

7. **Plant and Machinery** Plant and machinery support objectives within a number of bushfire suppression strategies. Interface environments can produce a range of safety implications for the operators and the supervising fire appliances. Situational awareness and adequate communications should be of a high standard to ensure safe operations.

SOP 3.5.10 – Crew Safety at bushfires
SOP 3.5.11 – Entrapment at Bushfires

8. **Water supply considerations** Effective and safe firefighting operations in any strategy will require sufficient water supplies. Depending upon the RUI environment, types of water sources will vary, be limited or not be available at all. Water supply planning and considerations are crucial for IMTs to provide safe and effective operations for responding crews.

In planning for available water sources consideration should be given to available static water supplies and whether the area being deployed to has reticulated water supplies. This information will determine the appliance configuration for deployment.

9. **Structural Triage** Structural triage is undertaken prior to the arrival of the fire front to ensure valuable resources are deployed against feasible tasks where they will have greatest effect. This proactive preparation activity is outlined in SOP 3.5.6.

SOP 3.5.6 – Structural Triage

10. **Employment of Strike Teams (ST)/ Task Forces (TF) at the RUI** The planning process for the deployment of resources ST or TF's, must consider the type of environment that they will be operating in. That is, what will be an effective appliance type for that geographical area, the strategy to be employed and what water supplies are available.

SOP 3.5.7 - Employment of Strike Teams/Task Forces at the RUI

11. **Immediate Street Assessments** Assessing structural survivability or level of involvement are reactive decision-making methods that may need to be employed after implementing ember, backstop and safeguarding strategies.

SOP 3.5.8 – Immediate Street Assessments at the RUI

1. **General** Crews involved in structural defensive tasks at the Rural Urban Interface (RUI) must be able to quickly deploy into standard defensive postures. Standard drills allow common understanding and expectations between ST/TF Leaders and crews when tasks to protect particular structures are assigned under pressure situations – and valueble response time cannot be expended on directing how each particular structure is to be defended.

2. **Phases of Structural Defence.** External structural defence occurs through five (5) phases:

1. Immediate Street Assessment and Tasking
2. Preperation and Layout
3. Fighting the fire front
4. Mop-up
5. Redeployment

3. **Immediate Street Assessment and Tasking**. Upon arrival within their sector, ST/TF Leaders are required to undertake an Immediate Street Assessment in accordance with SOP 3.5.8 Immediate Street Assessment at the RUI. The result of this assessment should be a prioritized task list. Crews are to be tasked in the standard SMEAC-S format.

4. **Preparation & Layout.** Crew Leaders are required to conduct a size-up of their defensive task and apply the basic defensive drill. A basic sequence for applying the defensive drill is as follows.

STEP	NOTES
Position the Appliance	• Fire appliances should be backed in and located near the structure on the lee side (this may not be in the driveway). In this position appliances are shielded from the heat of any approaching fire and the lengths of hose layouts are minimised. • Appliances are to be left running, beacons on with all doors, windows and lockers closed from ember attack. • If the drive way is short, park on the street (ensuring traffic is not blocked). • Do not park under power lines, in flammable vegetation, near sources of intense heat (e.g. outbuildings) or LPG cylinders.
Hose Layout	• Assess the direction of the approaching fire front and deploy hose lines to provide mutually supporting coverage in that direction. • Deploy 2 x 40mm lines up to a max of 2 lengths each (max 60,m) with branch attached, lay 1 x 40mm line each side of the structure. • All hoses should be charged, flow confirmed and protected against potential sources of damage. • DO NOT USE HOSE REELS (reason – no means of quick disconnection).

Prepare the Defendable Space	• Survey the immediate area for hazards to firefighting operations (e.g. trip and fall obstacles that may not be observed in smoke). • Clear or remove primary fuel sources (scrub, shrubs, overhanging branches). • Move secondary fuel sources (outdoor furniture, LPG cylinders, wood piles). • Clear fine fuels from specific points of entry (doorways, flyscreens, gutters/eaves). • Consider creating a firebreak. • Remove vehicles from the fires path. • Consider animals as a potential hazard - either release or confine them.
Prepare the Structure	• Check electricity status (DO NOT turn power off to pumps). • Check gas is turned OFF. • Close window drapes. • Turn fans, coolers, and air conditioners off. • Close all external doors (doors should remain unlocked to allow quick access to refuge).

5. **Fighting the Fire Front.** Water may be a limited resource and a clearly prioritised plan to combat the fire front will ensure water is not wasted or used on wasted effort. Guidance is provided as follows.

Dealing with Spot Fires	Ember attack will precede any significant bushfire and will cause spot fires across a broad area all around the structure. Crew leaders should determine a 'spotting-zone' which all members understand is to be kept free of fire as a priority. The spotting-zone should be the area identified as most critical to the successful denial of the fires approach.
Use of Water	Generally, wetting down is a waste of water. Under severe fire conditions most of it will quickly evaporate. Clearly prioritise the use of water to maintaining the *defendable space*: • Target spot fires. • Knock down the encroaching fire front. • Prevent access to vertical fuels and tree crowns. • Prevent access to noted heavy fuel sources. • Extinguish ignitions on the structure immediately (avoid glass).

Fighting the fire	In light fuels the fire front may pass very quickly, often in minutes, however, in dense fuels, bushfires may take 10 -15 minutes to pass. As the front approaches crews may have to seek refuge behind the structure or inside it. Options for handling the fire itself are as follow: 1. **Offensive Firefighting.** When fires are burning in low, light fuels and not driven too hard by wind and/or slope it may be possible to utilise the reduced fuel loads in a well prepared defendable space to directly suppress the flame front. 2. **Defensive Firefighting** • **Line Defence** Most fast-moving bushfires will be far too intense to be stopped entirely by a single crew. However, through the prioritisation of effort, a fire can be shaped each side of the structure (consider wearing BA). After the fire front has passed effort should return to the remaining fire and the structure. • **Ember Attack.** The protection of assets threatened solely by ember attack, when approaching a line of fire is too intense to be suppressed by offensive means and is producing significant ember attack from fire brand. Spot fires only are extinguished that threaten further fire development that could cause structural involvement • **Backstop Defence**. On days of >Severe FDR there is little that will abate the progress of a bushfire in heavy fuels. Such conditions demand the preservation of the crew's safety as the first priority. Crews should seek refuge in the appliance on the lee side of the structure and take whatever actions are required to preserve their lives and the appliance. After the fire front passes crews should extinguish spot to reduce exposure to property.

6. **Mop-Up.** Efforts to mop-up should be thorough without being meticulous. The goals are to target all free-burning vegetation within the defendable space and ensure all ignition points are extinguished so that the structure can be left behind with reasonable confidence it will not re- ignite. Handing over the property to residents (even one resident carrying a watching brief over 5-6 properties) is by far the preferred option.

7. **Redeployment.** In defensive mode the role of firefighting crews is to control fires - not necessarily to completely extinguish everything in sight. Firefighters must be prepared to move on quickly and leave residents to extinguish any small fires that remain. Homes are the priority not outbuildings or fences and delayed departure will place the next residence requiring defending at risk.

8. **Emergency Withdrawal.** Safety at bushfires is maximised through adherence to the safety planning advised by LACES. Crew leaders must maintain communications, remain situationally aware and continually update their withdrawal plans. If ordered to withdraw crews should undertake the following actions:

- Abandon all hose lines (disconnect and retain branches).
- Move to the appliance and account for the crew.
- Withdraw in the appliance by the planned route to the planned ST/TF rendezvous or safety zone.
- Advise the ST/TF Leader of each action as it is undertaken by radio.

9. **Structural Defence Procedure.** The structural defence procedure is to result in the crew deployed as depicted in Figures 1 and 2.

Figure 1 – Basic Structural Defence Procedure

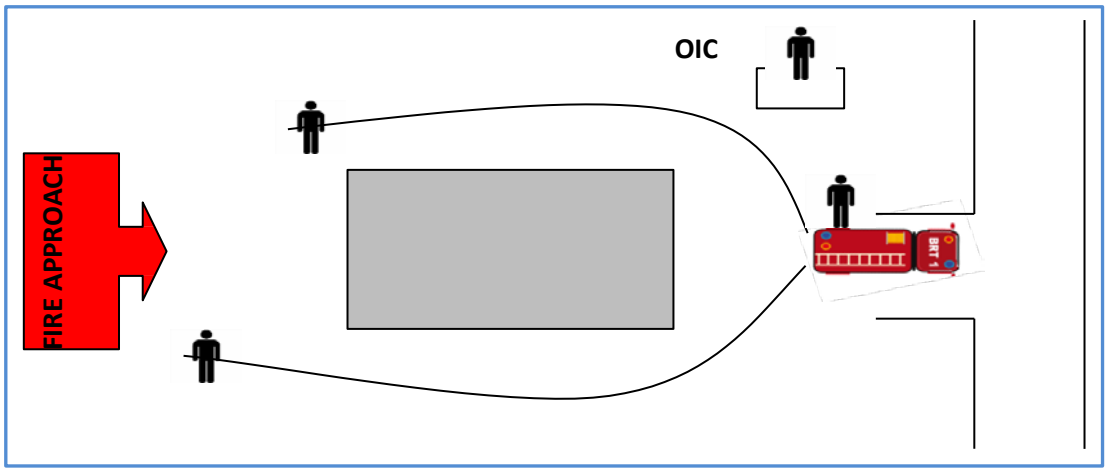

Figure 2 – Basic Defence Procedurel Adapted to Local Conditions[1]

1 Variations. Single crews can be used to protect two structures that are within 15 m of each other. Two LT can be used on a single task to protect the same structure.

DOCUMENT HISTORY

AUTHOR	POSITION	VERSION	DATE	DESCRIPTION of CHANGE
A.J. Hinton	OIO	1.0	Jul 10	*New SOP created. New sections created:* • *(All)* ***Source documents:*** • *Determining Structural Triage (Arnol)* • *Triage for Fireground (Arnol)* • *Rural Urban Interface Firefighting Techniques (Arnol)* ***All listed SOP/SAP, now retired.***
G. Civil	OIO	1.1		Repair hyperlink and add version to document control
J Calabrese	Doctrine	1.2	May 12	Re-format to current doctrine format No new information added
S. Bignell	Doctrine	1.3	Nov 13	Changed Strike Team to task Force as per AIIMS definitions
M. Payne	Doctrine	1.4	Oct	• Change to Deploy 2 x 40mm lines up to a max of 2 lengths each (max 60,m) with branch attached, lay 1 x 40mm line each side of the structure.
		2.0	Sept 18	Major review of document Name of SOP changed from Structural defense at the RUI to Firefighting within RUI environment