

JOURNEY MAP

RURAL/REGIONAL FIRE - ILLUSTRATIVE SCENARIO (Hypothetical)

The following scenario is hypothetical only and is meant to reflect the typical issues faced by a Rural/Regional Fire Services agency in any jurisdiction across Australia for this type of incident. The actual practices and devices used by the relevant agency in individual jurisdictions in a similar situation may vary.

Large scale bushfire

A large bushfire nears a rural town with a population of over 15,000. Due to a recent nearby fire, local MHO lovers have been destroyed and there is no mobile connectivity in the town or surrounding areas. After a wind change, the fire prevents evacuation via any route, with several hundred properties at risk within a very short period.

"Our crews were deeply concerned at how complex the fires were becoming. The winds changed too quickly for our meteorologists and fire controllers, with crews too dangerous to access. Decision-making was severely tested. Rural crews were stretched trying to manage each fire that threatened someone's home"

Event
Event Type: Rural bushfire
Duration: 2 weeks
Urgency of need: Critical ADAP
Challenge: 15000 (Community)
Location: Rural NSW
Geography: Rural/Regional
Environment: Bush and rural town residential
Access: PBA access only

Coverage
Temporary Coverage Required: No coverage (some MHO Sites down/over). Others impacted by power outage
Agencies on scene: Rural Fire, Fire & Rescue Services, Police, Ambulance
Capacity usage: Multiple staging points + a critical team + 30 trucks in the field

Actors
BAU: Business as usual
COW: Call on Whistle
IBC: In-building coverage
LMB: Land Mobile Radio
MHO: Mobile Network Operator
CC: Operational Communications
PSMB: Public Safety Mobile Broadband

Disclaimer for Illustrative Photos: Photos used are for illustrative purposes only and do not represent actual equipment, services and MHO RFP.

SETTING THE SCENE

3 DAYS INTO FIRE



At this scene, the bushfire is covering over 100 hectares of bushland. In-field crews continue to monitor and keep hotspots, located close to the containment line.

"There's a little more pressure up front for operations communications as we have to determine the right solution which considers both technology and logistics on a short-term basis."

The local region has a geographic combination of weather conditions, dry bushland and limited accessibility to fires. The previous nights have stretched the entire power grid and communication stations across the critical area. And a large number of MHO lovers have been down.

4 DAYS



"Once our plan for deploying an asset is in place, the team on the ground will execute it. There is often pressure to get this done very quickly, especially if it's a life-saving activity."



An coalition women, catastrophic fast-moving fire covered 200 MHO sites are being fought through the region. As a result, resources are stretched across a wide area, leaving a large area of focus. Locally, a wind change has sent the fire into a town, with several hundred properties set alight within a very short period.

Emergency evacuation areas are placed with residents given 15-minute warnings to get on or shelter in place.



"You've only got a set number of resources. So you're working with stretched incident teams, stretched from the perspective that it's a life-saving response, having to work out what is possible versus what is not."

5 WEEKS



"The incident will obviously end at a different point than the operations. We manage things very carefully to make sure that it doesn't turn into a repeat safety."



"You've got to get some prediction capability, and we've started to see where the expectations of the fire will go. We would embed an engineer inside the Incident Management Team. So that they would start to have much clearer contact with operations and planning."

6 WEEKS



The primary fire is contained, as the crews transition into the mop-up phase, ensuring the fire has not spread and areas are safe. However, there is still the risk the fire may flare up and re-ignite.

The fire crew now support the search for missing personnel, whilst some assets and personnel be deployed to other fire fronts in the area.

"We've seen it happen, a fire reignites and burns up, burning the mop-up phase back into active fire."

PREPARE LEVELS ON THE OPERATIONAL COMMS TEAM

High Pressure

Low pressure

FOCUSED
High pressure/high communication availability

STRETCHED
Low pressure/low communication availability

FATIGUED
High pressure/low communication availability

WHAT OPERATIONAL COMMS ARE DOING

1. DIAGNOSTICS
Assess the information to determine the factors that will shape the response.

The fire control centers have been sending the incident to the operations team. They have a control team who is not sending operational teams to the field.

2. OPERATIONAL COMMS TO BE MORE IDENTIFIABLE
The operations team are sending the incident to the operations team. They have a control team who is not sending operational teams to the field.

3. OPERATIONAL COMMS TO BE MORE IDENTIFIABLE
The operations team are sending the incident to the operations team. They have a control team who is not sending operational teams to the field.

2. SOLUTIONING
Review diagnostics to formulate an initial response.

The operations team are sending the incident to the operations team. They have a control team who is not sending operational teams to the field.

3. GETTING TO EVENT
Gather assets and team to the site location.

The operations team are sending the incident to the operations team. They have a control team who is not sending operational teams to the field.

4. INITIAL SETUP
Put in place and activate an initial solution.

The operations team are sending the incident to the operations team. They have a control team who is not sending operational teams to the field.

5. VALIDATE THAT THE FIELD TEAMS CAN USE SOLUTION
Ensure solution works for the equipment.

The operations team are sending the incident to the operations team. They have a control team who is not sending operational teams to the field.

6. MAINTAIN & MONITOR
Keep responses up and running.

The operations team are sending the incident to the operations team. They have a control team who is not sending operational teams to the field.

7. CONTINUAL INTEGRATION WITH ONSITE EVENT
Align with the team in charge of operations and other service providers.

The operations team are sending the incident to the operations team. They have a control team who is not sending operational teams to the field.

8. REVIEW AND ADJUST
Re-evaluate conditions and optimize the solution as needed.

The operations team are sending the incident to the operations team. They have a control team who is not sending operational teams to the field.

9. DEMOBILISATION
Scale down the solution and remove from site as needed.

The operations team are sending the incident to the operations team. They have a control team who is not sending operational teams to the field.

10. OFFLINE MAINTENANCE
Ensure equipment is ready for the next deployment.

The operations team are sending the incident to the operations team. They have a control team who is not sending operational teams to the field.

11. INCIDENT REVIEW
Gather and identify opportunities to improve.

The operations team are sending the incident to the operations team. They have a control team who is not sending operational teams to the field.

CHALLENGES AND SUCCESS FACTORS

Challenges: Limited connectivity, power outages, weather conditions, terrain, and large areas of focus.

Success Factors: Strong coordination, clear communication, and effective resource management.

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Large scale bushfire

A large bushfire nears a rural town with a population of over 15,000. Due to a recent nearby fire, local MNO towers have been destroyed and there is no mobile connectivity in the town or surrounding areas. After a number of days, the fire prevents evacuation via any route, with several hundred properties at risk within a very short period.

"Our crews were deeply concerned at how complex the fires were becoming. The winds changed too quickly for our meteorologists and fire controllers, with areas too dangerous to access. Decision-making was severely tested. Rural crews were stretched trying to manage each fire that neared someone's home"

Event

Event type: Large bushfire
Duration: 2 weeks
Urgency of need: Critical ASAP
Civilians: 15000 (Community)
Location: Rural NSW
Geography: Rural Hinterland
Environment: Bush and rural town residential
Access: PSA access only

Coverage

Temporary Coverage Required: No coverage (some MNO Sites destroyed. Others impacted by power outage)
Agencies on scene: Rural Fire, Fire & Rescue Services, Police, Ambulance
Capability range: Multiple staging posts + 6 strike teams
Connections required: Average 70 people at each staging post + 30 Trucks in the field

Acronyms

BAU: Business as usual
CoW: Cell on Wheels
IBC: In-building coverage
LMO: Land Mobile Radio
MNO: Mobile Network Operator
OC: Operational Communications
PSMB: Public Safety Mobile Broadband

Disclaimer for Illustrative Photos: Photos used are for illustrative purposes only and are sourced from online newspaper articles and NSW RFS.

SETTING THE SCENE

3 DAYS INTO FIRE



At the scene, the bushfire is covering over 100 hectares of bushland. In-field crews continue to monitor and map hotspots located close to the containment line.

The Strike Teams arrive at the staging area to receive the daily briefing on the progress of the fire and objectives for the day. However, they experience connectivity issues, meaning In-Field Command cannot easily share detailed information to in-field teams, or send and receive information to the central command.



4 DAYS



"There's a little more pressure up front for operational communications as we have to determine the right solution which considers both technology and logistics in a short time frame."

The local region has a dynamic combination of weather conditions, dry bushland and limited accessibility to fronts.

The previous night's fires have knocked the entire power grid and communication stations across the broad area. And a large number of MNO towers have burnt down.

"Once our plan for deploying an asset is in place, the teams on the ground will execute it. There is often pressure to get this done very quickly, especially if it's fast-rising fire."

PRESSURE LEVELS ON THE OPERATIONAL COMMS TEAM

WHAT OPERATIONAL COMMS ARE DOING

1. DIAGNOSTICS

Assess all the information to determine the factors that will shape the response.

The fire control centre has been running the incident for 24 hours.

1. Operational Officer reports to Logistics that they have a comms issue - who in turn contact the Operational Comms team to request support.

Operational Comms try to get more information about the problem they need to solve. No contact details at the scene have been provided. (If there were any on-site contacts, they would call them for input. However, in this case, as there is no mobile connectivity in the field, they have to look for info elsewhere.)

Operational Comms Teams check MNO Coverage maps, but they are unreliable because "MNOs suffer from..." After a number of calls, they find out that there is no broadband coverage in the town itself and within 5 kms of the town.

2. SOLUTIONING

Review diagnostics to formulate an initial response

Op Comms make a swift decision to get a solution on the road ASAP - they:

1. **Decide who to send with the equipment** (a team of two people in this case)
2. **Decide which assets to send based on the issues and location of available assets.**
3. **Speak with field MNO to find out if a closer (spoke) asset is available** - and are advised it will be one to two weeks before the MNO would be able to get something onsite.
4. **They also take stock kits** like simple radios in a bag and repeaters as backups.

Note: Local community members may also require connections as a matter of safety so they can receive fire updates, location services and evacuation orders. Whilst MNOs sometimes provide solutions in these scenarios, they may not be there in sufficient time to provide the connectivity when it is needed.

3. GETTING TO EVENT

Gather assets and team to the site

1. The Op Comms team pick up the temporary broadband coverage assets and kit from the storage location. (The equipment has been pre-checked but is also be checked again before they leave to ensure that it will work in the field.)

2. Drive to the incident - in transit, the comms team will try to get more details about the location so that they can identify the best sites to deploy the temporary coverage assets when they reach the incident. This will speed up the time taken to set the equipment up.

Storage preparation: Getting to the event quickly would be delayed if new assets arrive.

- **Locating equipment** - if returned to a different post from the previous event -
- **With the equipment not being ready to go** - Ensuring fire equipment is serviced, connected and functioning - ready to work
- **Getting access to the equipment** - getting lost in the way

Storage location

The assets are required ASAP, any extra time in transit will impact the safety of the PSA at the scene and the general public. Therefore the closer they are to the incident, the better.

In high risk scenarios, temporary coverage assets should ideally be moved to strategically located "staging" areas so that they are readily available for deployment when needed.

4. INITIAL SETUP

Put in place and activate an initial solution.

1. The Op Comms team arrive at the scene and immediately liaise with the in-field command post to validate the reported issues and confirm the setup location for the temporary coverage assets and

2. They then quickly move to the setup areas to get the temporary coverage assets up and working as soon as possible.

Notes:

- Picking the location for the temporary coverage asset can be tricky. Ideally it's located on elevated ground - as this is the safest place for the asset and for any people who are monitoring fire setting in the area.
- However, there are times when this is not possible, and extra precautions need to be taken to ensure the safety of those involved.

CHALLENGES AND SUCCESS FACTORS

Availability of intel from the scene: They need first-hand information but struggle to contact fire in-field teams to verify the problem.

Availability of assets and equipment: They have access to MNO coverage maps, but they are not always accurate and don't have sufficient information such as accurate ETAs for when connectivity will be available again.

Also, if recent fires have impacted the local towers in the past 24 hours, this may not be reflected in the current information provided to them.

The range of assets available: Because the issues are unclear, the team needs to carry a range of possible services with the deployed tech and kit, and allow for every possible contingency.

The time to get the solution: It is critical that the solution can get on the road ASAP to provide much needed communications to in-field teams. The technology, transport and people need to be well-located and ready to go.

Storage preparation: Getting to the event quickly would be delayed if new assets arrive.

- **Locating equipment** - if returned to a different post from the previous event -
- **With the equipment not being ready to go** - Ensuring fire equipment is serviced, connected and functioning - ready to work
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In high risk scenarios, temporary coverage assets should ideally be moved to strategically located "staging" areas so that they are readily available for deployment when needed.

Setup of set up: Set up is being undertaken under high pressure and is highly time critical.

Assets preparation: Getting to the event for setup (Pre-Broadband access only)

Often First Responders are the only people authorized to enter areas where temporary coverage assets are needed. Whilst "cover" technicians can be used, they need to be escorted in these scenarios.

Asset Mobility: The technical assets may need to be taken up to the top of a hill or down a dirt track. And they may need to be moved at short notice.

Power supply availability: If local substations are out, and generators in the area are low, the technical solution will require its own power supply.

Durability & Resiliency: The technical asset may need to withstand high levels of heat and smoke from the incident, rain, ash, and snow from the local weather.

- 2 WEEKS

- 3 WEEKS

As conditions worsen, catastrophic fast-running fires several 100 KM wide are now ripping through the region. As a result, resources are stretched across a wide area, having to prioritise areas of focus. Locally, a wind change has sent the fire into a town, with several hundred properties set alight within a very short period.

Emergency evacuation orders are placed with residents given 30-minute warnings to get out or shelter in place.



"So fatigue will obviously set in it depends on the incident. We manage fatigue very carefully to make sure that it doesn't start to impact safety."



The primary fire is contained, so the crews transition into the mop-up phase, ensuring the fire is out and areas are safe. However, there is the risk the fire may flare out of control again.

The fire crew can now support the search for missing persons, whilst some assets and personnel be deployed to other fire fronts in the area.



"You've only got a set number of resources. So you're working with stretched incident teams, viewed from the perspective that a lot is happening, having to work out what is possible versus what is not."



"We start to get some prediction capability, and we'll start to see where the expectations of fire will go. We would embed an engineer inside the Incident Management Team. So that they would start to have much closer contact with operations and planning."

"We've seen it happen, a fire reignites and flares up, turning the mop up phase back into active fire."

FATIGUED
Fatigue is a major cause of human error.

5. VALIDATE THAT IN-FIELD TEAMS CAN USE SOLUTION

Ensure solution works and the operation can use the equipment

Once the solution is set up the onsite Op Comms team will:

1. **Validate that the solution is working** with the in-field teams who originally reported the issue.
2. **Integrate solution back into the Incident Management plan.** At this stage they let them know what they've done and how best to use it.
3. **Ensure in-field teams know:**
 - That the problem is resolved
 - Anything they need to do in order to use the solution such as the WHI/SSSD and any passwords.

6. MAINTAIN & MONITOR

Keep equipment up and running

Once in place, the temporary coverage assets may be left in the field whilst the Op Comms team representatives at the site attends to other issues to support the response effort.

Depending on the circumstance, it may not be safe to stay with the asset due to fire risk. OR it may be better to remain within access to the asset, so they are on hand to maintain and fix it without the risk of transit in and out of the incident area.

Things that will be undertaken as part of ongoing maintenance include:

- Checking and replacing batteries
- Re-fuel generators
- Ensuring the asset is safe and secure from environmental factors and even thieves

Typically, the performance of any temporary coverage assets is monitored and managed remotely.

7. CONTINUAL INTEGRATION WITH ONSITE EVENT

Align with the team in charge of operation and other service providers

The Operational Comms team undertakes ongoing liaison with the Incident Management Team. They may embed a member into the Incident Management Team to stay ahead of any changes needed.

Continual connecting with the onsite team to ensure the deployed solution still meets needs and notify them of any changes to the solution as they occur.

8. REVIEW AND ADJUST

Monitor conditions and optimise the solution as needed

As the location of the fire shifts, the current solution may no longer be optimal. In response to this, Operational Comms may:

1. **Add more assets** - if the size of the incident has increased.
2. **Move the equipment** - In-field crews may move with the fire and critically require coverage.
3. **Support the relocation of the staging area** as the focus of the fire moves.

9. DEMOBILISATION

Scale down the solution and remove from site as needed

Once the fire is under control and looks to be over, the Op Comms team receive advice that the incident is moving into the Mop-up phase.

1. **If they are required to support missing person searches** - they may need to keep the comms solution going.
2. **The fire may flare up, so in-field comms must stay available** to reactivate or scale up the solution.

Once the mop up phase is complete, the lead recovery agency will take control. The fire crew will:

1. **Pack up the solution** - break the gear down, get it ready to transport
2. **Transport it home.**
3. **Check that all assets are returned to their correct location**

10. OFFLINE MAINTENANCE

Ensure equipment is ready for the next deployment.

Ensure the equipment is maintained between use. This includes cleaning, checking, refuelling, servicing etc.

11. INCIDENT REVIEW

Debrief and identify opportunities to improve.

INCIDENT REVIEW - Every event has an incident review involving a debrief, and lessons learned documentation.

Scalability and reuse

Strike teams are in motion following throughout the day, which can make them difficult to locate to validate they are connected.

Easy to connect for and reuse.
In-field teams are focused on the fighting - there is no time to troubleshoot with them.

Deployability & Resilience

The environment continues to be tough on any assets left in place. They may be in the path of the fire or on the ground around.

Lighter-weight assets, such as satellites and WiFi boxes at staging points, must be environmentally resistant.

Power supply durability
Assets left in place need power supply which can last a long time.

Easy to repair remotely
The asset requires remote monitoring of coverage performance and access to the manufacturer functions (e.g. fuel). In an emergency situation, it's typically not feasible to have somebody with assets at the time.

Interoperability (various PSAs)

When there are multiple PSAs at an event - as there typically are at large incidents - ensuring First Responders from all agencies can access Temporary Coverage Assets is crucial.

Adaptability

The set of solutions available need to be readily scalable - and able to adjust to different demands over time.

Mobility (move asset locations)
The location of the fire moves regularly, it's crucial that the assets can be moved to match this.

Asset management (location)
Assets may need to be left at the scene over several days.

Easy to pack up

Equipment needs to be located and accounted for; anyone should be able to pack it up.

Easy of maintenance/turnover

The asset has been exposed to harsh conditions and bumped around for several weeks, which requires a thorough check.

Historical Analytics

The asset was deployed quickly, and the teams using it would not have any time to note performance. Access to historical data on performance is critical for any analysis that is to occur.