

Video Transcript: Mics & Sirens Season 2 – Episode 5

[Female Narrator] You're listening to Mics and Sirens, the official podcast of the Department of Fire and Emergency Services in Western Australia. DFES acknowledges the traditional owners on the land of which this podcast is created, the Whadjuk people.

[Sirens sound while news footage of fires play]

[Russell Turner, Fire and Rescue New South Wales] Ten years ago, there's no way I would have thought we'd be flying little plastic drones into buildings. The intelligence we get back from that drone is just absolutely priceless. I can fly in and take chemical samples without putting people in the splash suits, making fires go out quicker, keeping our people safe from the short-term effects, but more importantly, from the long-term effects. We're not committing our people to those sort of environments.

[Female Narrator] Picture a chemical recycling plant with hundreds of gas cylinders on fire. The flames spread at lightning speed. The scene - too dangerous for firefighters to stay and fight. Cue a swarm of drones flying directly into the frontline, making sure fire trucks and their hose lines are in the right place; hovering gas detectors over the building, checking levels and confirming the types of chemicals inside the danger zone, all in real time. This was a real-life incident. One you'll hear Russell Turner from Fire and Rescue New South Wales talk about. In this episode, Russell shares how drone technology can make a difference on the frontline, here and around the world.

[Di Darmody, Interviewer] Welcome, Russell.

[Russell] Thanks. Great to be here.

[Di] Now, some of us will be familiar with the use of drones in emergency services, but would you be able to describe the ones you use at Fire and Rescue New South Wales?

[Russell] Drones have been around for years now. And your standard drone - anyone can put a camera in the sky, so our drones very easily can be put up in the sky and livestream back for someone to view the footage we've got. They can be used with a video camera as well as a thermal camera. And that's really the bare bones of what we use the drones for on a day-to-day basis. We've been doing that for nearly nine years now, but the technology is improving so much at the moment. There's a few things going on around the world which drone technology has actually gone through the roof in the last few years, but we're now using drones for more than just that camera in the sky. We're using it to do a whole range of different things, which I'm sure you're going to ask me about at any time.

[Di] Probably. [Laughs] So nine years, can you take us back to how RPAS first started then?

[Russell] In 2016, we were halves in a helicopter with the police. So Fire Rescue New South Wales and the New South Wales Police had half a helicopter each, which we shared, and they chose to discontinue that program. So we had two aviation officers who didn't have any aircraft. So someone at the time did some research, found a couple of drones for them to start looking at. And in the years that followed that it was a very, very small program where they had these drones, which were a brand new thing, and it was literally a camera in the sky, and they were flying it there.

And in the years up to the Black Saturday bushfires in 2019/20, that's when the thing really exploded through the roof.

[Di] So those early days and the first operation of these drones, how were they actually used in incidents?

[Russell] Just a camera in the sky. So pretty much a camera in the sky and the operator would walk across with the little screen on the remote control and show, so that people could have an overview over the top. When you're on a fireground and you're looking from the street, you get a very one-dimensional view of the fire, and the ability to look up and over and around is just next level as far as making really good decisions for the commanders.

[Di] Fire and Rescue New South Wales now manage the largest drone program in the country. How many drones do you have and how has the program expanded since it began?

[Russell] We believe we're the biggest fire service program in the country. Happy to be corrected by anybody who wants to do so. We have now got just over 120 drones in the fleet, all across the State. We've expanded the capability to all the fire stations in regional areas that had drones before. Every three years, we replaced them with new ones.

With the funding we received after the 2020 inquiry, we managed to install drones at more than 25 fire stations. We employed five full-time firefighting positions as drone operators, and that's our only full-time job. And we also have two data analysts who do the things with the information. They keep reminding us that we're just glorified data collectors. And it's no use collecting data without doing something with that data. So that's always something to remember. And then they installed a fleet of vehicles as well. So we have five fully set up vehicles, and that was all done with that injection after the 2020 bushfires. So we've expanded that capability and we continue to expand as needed. We get money every year for new capability because it's changing so quickly.

[Di] Tell us about those vehicles. How are they set up and how are they different than a general emergency service vehicle?

[Russell] I have probably the best specked-up vehicle in the fleet. Mine was retrofitted from a standard duty commander pod on the back. So they're four-wheel drive vehicles, dual cab four-wheel drives. And you open the back pocket of mine, and I've got a 43-inch television across the back of my car. The idea being that when something happens, I can reverse my car or place it near the command post. We can livestream as well, but to have something outside so that people can stand around a big screen. And the old days, I was looking at this little five-and-a-half-inch LCD display. Now, we can put on a 43-inch television. We can have engineers, we can have commanders, we can have local experts, the police, all the other agencies stand there, and literally direct the operation from the back of that car without trying to look around this little screen. Starlink on the roof, battery charging systems, all that inside. Really well done. And the organisation has done a great job of supporting where we want to go to.

[Di] Within a fire situation, what does being a drone pilot involve? Is that what they're called? What's the terminology for the person who's driving the drone?

[Russell] Remote pilot. So, when we use the word drone, sometimes some people get a bit upset because drones are used in other parts of the world to do not so nice things. So we try to avoid the use of drone, even though it fits into that every now and then, but they're RPAS.

As a remote pilot, your job is to capture the data and something that can be useful for others to use. So you've got to be thinking about a few things, and it's a whole range of things, not just the airspace law from CASA and all the requirements about the media helicopters in the air, water bombing aircraft in the air. You got to have all that understanding. It's a private licence. So we go through and that's all external. So you get a full remote pilot licence, not a fire rescue qualification. So you get that licence and a remote pilot will ask the controllers what they want, and then hopefully provide that service and maybe prompt, "hey, we've also got this new technology here. Do you want us to fly a gas detector over the chemical leak and give that information as well?" They don't know what they don't know.

[Di] I understand there were two particular incidents in February 2025 that occurred a couple of days apart, that really highlight the ability of RPAS to protect firefighters and improve firefighting efficiency. Can you tell us about what happened in the first incident?

[Russell] The first incident was a large chemical recycling plant in western Sydney, and they had a fire in the holding yard as they were unloading a truck. And it quickly spread to thousands of pressure vessels: different gas cylinders, canisters, aerosols and the like. And that led to a really quick spread of the fire, which then lit up some solvents adjacent and a storage yard adjacent, and really quickly became a spectacular fire.

Directly next to the fire was a 100 metre by 50 metre warehouse full of chemicals and different recycling products, and if it got into there, we'd probably still be there trying to put it out. And that structure fire they called an alarm very quick. The first arriving stations, they did some amazing firefighting initial operations. But at some point in time, the fire became so quick, so fast, they were all withdrawn. Because they'd done some really good operations to start with, they were able to leave the lines in place and stop the fire from spreading in other places. When the drone arrived, there was a lot of confusion as to how the firefight was going, because, again, people were looking at it from the street.

So we put the drones above. We had five drones in the air at that fire. We had two over the fire, providing livestream back and directing the hose lines onto the fire, making sure that every bit of water we put on there was being used as it needed to be. We have a long history in fire services of just shooting water into smoke and hoping for the best, but using the drone technology, we're able to give them feedback and say, "hey, that water stream is not doing something, you need to direct it back over there," or "that truck, it's a waste of time there, you need to put it on the other corner." So providing that live feedback was able to - pretty much that fire was out in about two and a half hours, whereas we were expecting it to go well over 24 hours.

And it was based on two things: the initial actions of the firefighters at the start, and then the feedback from the drones at the finish. The third drone we had was flying a gas detector over the top of the fire. The fourth drone, we flew into the building. We have an indoor drone that we can get intelligence from inside the building. So again, without exposing our people to the risks, not only of that explosion inside the building, but also the long-term effects of the chemicals, because it was a rather black smoke and quite acrid. The intelligence we get

back from that drone is just absolutely priceless. Is the fire in the building? Yes it is. Are the hose lines they put in place still holding? Yes they are. There's no need to now commit more people into the building and give them those chronic issues that, long term, we're still getting far too many cancers in the industry. Can we do anything else with drones and robotics to reduce that exposure?

At the same time, we had a drone flying down the creek to see what the run off was doing to make sure we weren't killing the fish. So we're reducing the amount of water we're putting on the fire, thinking that it's all going to go down the local waterways, so that we're monitoring that. And yeah, the fifth drone was the gas detector over the top. So we had five drones in the air. Some would say a swarm but not quite a swarm.

[Di] That's really incredible, isn't it? What you're able to do and all of those aspects of the fire that you can have access to, that would take manpower, put people in danger, as you say, expose them to really dangerous situations. It's pretty amazing.

[Russell] Historically, the commanders out there on the fireground make a lot of assumptions, without getting a good view. Sometimes they will ask for a report from an aerial platform from above the fire. So that person who's up in the basket, as we say, is looking over the fireground, and they're going to describe what they're seeing. If there's black smoke pouring out, they actually can't see much apart from a lot of black smoke. So they're going to make assumptions too. So whatever they're seeing, they need to put into words, in their head; they need to say it over the radio. And they've usually got a mask on, so it's very muffled. It's got to be broadcast to the person who's receiving it. They've got to decode it, based on not much information up there, and then they've got to paint their own picture in their own mind. So what they actually get in their mind is totally different to what this person's seeing here. So that's the traditional way. And they might get those reports from three or four different people to try to get an idea of what's happening.

Or now with the new technology, they can just say, "can you put a drone up and take me around the back?" And they can stand on my car, look at the 43-inch TV and go, that's what's happening. They can look through the smoke using the thermal camera. There's no assumptions. There's no guesswork. It's just an amazing adaptation of technology, that's making fires go out quicker, keeping our people safe from the short-term effects, but more importantly, from the long-term effects. We're not committing our people to those sort of environments.

[Di] That particular incident in February 2025, two days later, you were needed again. What happened with the second fire?

[Russell] Well, it just happened to be the same crew on deck, who saw the drone at the first fire. And they, again, very just down the road, they had an industrial fire and a steel mill where a conveyor belt had caught fire, broke and the whole conveyor belt had fallen back – 200 metres long Industrial conveyor belt - had fallen back into the underground area, where it was a big hopper, and it was on fire - 50 tonnes worth of rubber. So it's 25 metres below ground. The only access was down a narrow staircase. Extremely dangerous. Basement fires are extremely dangerous. And historically, again, we would just put firefighters in there and say, just stay safe and a little bit of finger crossing to be honest.

So initial actions, they started doing that. Then they sort of went, "hang on, can we send a drone in here to get the same information?" Because they're just going down to see what's going on. The foam's going in. The water's going in. Can we send a drone down instead of committing our people into that hazardous environment? So we were called there. We flew the drone in: underground through the tunnel system, got access to see where the fire was, where the foam was, what was going on down underneath as well, without exposing our people to the danger.

[Di] Russell, I understand that using drones in these particular incidents was seen as a game changer.

[Russell] That's often used - that term is often a throwaway line. When we arrived at the first fire, I've been in the service for 33 years and I'm in charge of my unit, so we had four pilots there. I started thinking, "well, I'm going to have to send two home because they're going to have to come back in eight or ten hours to do the night shift." So we're not working all the way through. And on speaking to the commanders afterwards, they were doing the same thing. They were thinking, well, this is going to go all night. We need to start sending people down to do that crew rotation to make sure we get it covered.

Two and a half hours later, the fire's out. Literally, the fire is out two and a half hours later. And again, based on that first initial firefighting, the equipment that they used, but also because of the good use of water around the fire. So game changer absolutely. We're going to small house fires now to put a camera over the top to make sure it's all extinguished because a two storey townhouse, instead of committing firefighters upstairs, through broken stairwells and where tiles can fall on their head, we'll just put the drone over now, do a thermal scan. There's no fire there, they can go home. The crews are now getting to appreciate that that's actually making their job more efficient, and they're calling for us more.

[Di] Well, that's what I wanted to ask you about how firefighting crews are embracing this technology. How are they feeling about it?

[Russell] You still get the old heads who go, "no, no, no. I'd rather use a whiteboard and get a radio report." But once we sort of sell the product, we do a lot of sell. We need to get out there and sell because the feedback is often we don't know what we don't know. So we have to engage our firefighters, our frontline crews. They're our people, right?

When we were the only drone organisation in the State, we were doing work for all the other agencies and really not neglecting, but not putting as much of a focus on those. Now, all the other agencies have got drones. It's like, well, let's start providing great products for our people to make sure they're safe. So the more we sort of pushing in, the curve is going to be exponential.

[Male Narrator] Working as a firefighter at the Department of Fire and Emergency Services in WA, is a career where you get to help keep the community safe every day. So are you a team player, resilient, compassionate and courageous? If that sounds like you, come and join us. Visit the DFES website: dfes.wa.gov.au to find out how you can join the frontline.

[Di] I understand you're constantly adapting the technology. You mentioned that earlier. How do you do that and why is that so important?

[Russell] Well, there's no more dinosaurs around on the Earth, are they? They didn't adapt very well. Anyone can put a camera in the sky. Anyone can go to JB Hi-Fi today, buy a drone and put it in the sky. In fact, it's easier now for me to walk down to JB and put it in the sky as a recreational user. There's some exemptions you don't get, but it's actually less burdened administratively.

But yeah, we're adapting the technology as it comes out and whether that be new things that can carry. We now have a drone that can carry a 40-kilo payload. So, based on the weather events in New South Wales recently based on some landslides that I went to. I'm an urban search and rescue technician from last century. And there's - you picture Thredbo landslide where there's 200 volunteers up the hill and they're passing the rubber buckets up and passing the equipment back and all that sort of stuff. Well, I can just fly all that stuff in and out now using a drone and not put those 200 volunteers or other agency workers in that danger zone. I can do that sort of stuff. I can fly in and take chemical samples without putting people in the splash suits. And you need 11 people to set up for a HAZMAT job; I can do it now with one drone operator.

[Di] Last year, drones were used in a search and rescue in Sydney I think, at the request of New South Wales Police. How did that work?

[Russell] New South Wales Police are the combat agency for coordinating land searches. They have a drone capability. It's not nowhere near the size of ours. And we do - if they call, we will go and help them. So it is their responsibility to run the land search and what agencies they use is up to them. We're adapting the technology. One of the first things I did when I came into the job three years ago nearly, from an urban search and rescue background, I wanted to try to merge the two. So that's why we're able to fly inside buildings now and do deliveries now under to collapse sites and all that sort of stuff.

But I wanted to know how we do search better, how do we use a drone to do search? And I did a heap of research around the world pretty much and no one really had an idea. So we did our own research and came up with a search program, and we rolled it out across the whole State over a year. And now we're able to use the drones in methodical ways to try to locate people. Up until then, it was put the drone up and cross your fingers and hope you luck in. Now, we have a process. It's providing massive amount of benefit. We used to have, I'm guessing here, maybe 10% success rate. Now, we're well over 50% success rate trying to find missing people lost in the bush. And every week now we have a win when we're using a drone to find someone, whether that be someone who has been ejected from a motor vehicle accident, whether it's a concern for welfare, whether it's someone who's having a hard time sitting on the edge of - a cliff edge or something like that.

We're able to use the drone to provide all those other things which we would never thought a few years ago we'd be able to do. We were just going to fires.

[Di] We've mentioned some specific fires. What about bushfires, though? How have drones been tested in that environment here in Australia?

[Russell] Not very well. That's the next big thing. I mean, AFAC have a very successful aviation working group, which we sit on, and drones - when we walk into an aviation working group, it's all about helicopters. So we're trying to make it normal. We now have a state air desk in New South Wales which only dealt with crewed aircraft. We now have a seat at that

table to sort of say, "hey, we're here as well, is there anything we need to know?" We've had some instances where we've flown at bushfires, when we're getting intelligence livestreaming back to command cells, and they've had water bombing aircraft in the air. We've had learnings out of those and been able to sort of work around them and go, "well, how can we share that airspace with crewed aircraft, or what are the rules if we do?"

It's all been approved by the federal regulator. And so we've been working closely with all the agencies to try to do that. And whether it's just we set up on one edge and just watch the fireline, and look for spot fires.

Even for hazard reductions now, you put the drone up, sit on the corner, and then you see - you've got a line on the map, and you can see a hotspot outside. We're putting crews in much faster. Whereas years ago, you would have to wait for that to get big enough for someone on the ground to see it through the canopy to go, "there's a hot spot over there." Or you're paying \$6,500 an hour for a helicopter to do the same job, which we're doing for 50 bucks an hour. So bushfires are the next big thing. We can't - we can now drop aerial incendiaries, so we can light burns using the drones. That's no problem. We've been doing that for years as well, but people say, "why don't you do water bombing?" The weight of the water would be quite problematic. You'd need hundreds of drones to do the same thing. So there's - in the bushfire fighting space, there's room for everybody. And if we can work together, I think that would be a much better place. And that is probably the next thing we'll be looking at. How can we cement that?

[Di] Around the world, are there any innovations in drone technology that we should be considering here, Russell?

[Russell] I can't wait to lift someone. I said before I retire, I want to be able to lift someone. I want to be able to - so, I'm also a swift water rescue background. So if we have someone on the roof of a car, my utopia is and. I've committed crews to places which have been quite risky. And standing on the shoreline means a commander responsible for making sure they're going home is like number one. And sometimes it's like, please just be safe. And you're like a worried parent on the shore waiting for them to come back.

So, in the swift water space, what I want to be able to do is actually fly the rescuer out, put them on the roof of the car, put a lifejacket on the person, fly the person back, go back, get the rescuer and no one has to get in the water. In the water is the most dangerous place. Under a drone, some would argue would be different.

Now, there's a lot of rules from the federal regulator that prevent us doing that at the moment. The technology is nearly there to actually do it. There's 100-kilo drone out now. So if I get a smaller firefighter with all their gear, it's probably OK. But we just need to work through the regulation side of it and legalities.

[Di] We've heard a lot about the positives that drones can bring to fires, to search and rescue and other elements. Are there any challenges with drones?

[Russell] Apart from the acceptance of others of the technology and the ability of what it can bring to complement what already exists, not necessarily replace what exists, but to complement where we're getting the data from. Are there any challenges? Absolutely. There's challenges with people concerned about their privacy. There's, as things are

happening overseas, people will see a drone in the sky and panic and say, "what's that drone going to be doing?"

[Di] You mentioned acceptance. What would you say to somebody listening to us and or watching this about the role that drones could play in helping firefighters and keeping people safe?

[Russell] I have a line, I say, at least once a day. So my wife, when she bids me farewell to go to work or whatever, or welcomes me home, I'll say, "they're not toys Samantha." So she calls them toys. "You got to work to play with your toys." I have the best job in the fire service now, and I don't get to go to work to play with toys. They are actually really useful pieces of kit that will provide safety and lots of really good intelligence for people if they're used in the right way.

[Di] In this series, Mics & Sirens, we speak to fire and emergency services experts from all around the world. They all bring their vast depth of knowledge and a wide range of experiences. But all our guests, Russell, are connected by a personal drive to improve how we respond to and manage emergencies. So, I hope we could delve into your personal experience and ask firstly, what inspired you to work in emergency services originally?

[Russell] I often get asked that, so I applied for the fire brigade as it was back then while I was at school. I think it's because my brother, a few years before, joined the Rural Fire Service as a volunteer, and I saw him go off and do that sort of stuff, and I thought that was pretty cool. So every year the TAFE handbook would come out or the careers handbook, and I found this job: aviation firefighter. And I went, "oh, wouldn't mind giving that a go. I see what he does and surely it's the same." I never applied for an aviation firefighting role. The ad just came out while I was at school to join the fire brigade, and I applied and I didn't get through the first time, so I had to wait two years to resit, and yeah, got in the first class then and have never, ever, ever looked back.

[Di] Is there an incident that stands out in your mind even today that you could share with us?

[Russell] Probably two. One would be the Glenbrook train accident from 2000 and whenever that was. 1999. Yeah, 1999, I think it was. The Indian Pacific train ran out the back of, sorry, another train ran up the back of the Indian Pacific train, and it's pretty much sliced the carriage in two. We went up there from - I was a HAZMAT technician at the time, and that really opened my eyes as to those major incidents. And I could go to the smaller fires and the factory fires, and that was very comfortable. But to be put outside your comfort zone to try to deal with that, I think was quite eye opening.

And then, of course, being an urban search and rescue tech, deploying to the Japanese tsunami back in 2011. Standing on level six of a hospital and there's dead fish on level six of the hospital and there was nothing else you could see from horizon to horizon. That was the moment where I realised Mother Nature's always going to win.

We can try to influence, we can try to make minor changes, but we need to be ready for those things at that time. And just standing up there, it was just one of those moments in time you think we're just a flea on the back of a gnat, on the back of a dog which is running

around the world. And we just make that little difference. Leave a legacy when we leave here and move on.

[Di] Is there something about the work you do in emergency services that keeps you up at night or is often at the front of your mind?

[Russell] Something I do in emergency? No, I sleep pretty well now. I mean, I have a phone next to - I'm on call 24/7. Have a phone next to there. No, I'm a firm believer in everything happens for a reason. I know fire services are the biggest, most negative critics of their own service. We're guilty of it. I'm sure all the other fire services are guilty of it, but we need to appreciate what we have. I do a lot of travel around the world and look at different fire services. And what we have across the nation here in Australia is world class. Yeah, everyone does something badly, but everyone does a lot of great things. So, if we look at it in that perspective and we make those little differences every day, treat your people well, make sure they go home happy, make sure they're dealing with all the stuff at home before they worry about work, and really, not just say those words, but actually make sure that they know those words are true. I think that's the most important thing is making sure people are happy and everything gets done.

[Di] What technological development do you think will have the greatest impact on the future of firefighting and emergency services?

[Russell] I'm hoping if my boss is still listening to this, if he turns it on, I want to move down the robotics path. We learned some lessons in that big factory fire where we used the drone, and we're able to remotely move the hose streams from the aerial platforms, but the ones on the ground, we had to manually send people back in to actually do. So little things like robotic ground monitors that can throw water in the right direction without committing people back in.

Are there any ways that we can use robots to do the work? I was just in Singapore last week. They have a robotic dog for HAZMAT incidents. I mean, we can do that with a drone, but the robotics scene is working so well and quickly at the moment. I want to try to lever off that and see where we get to in the next ten years. Because ten years ago, there's no way I would have thought we'd be flying little plastic drones into buildings to get intelligence. So where are we going to be when I retire in a few years time? I don't know, but I can't wait to see.

[Di] And what's the most rewarding part of your job, Russell?

[Russell] The fact that I still get to drive down the road, and the little kids still turn around and wave to you.

[Di] Russell Turner, thank you so much for being our guest on Mics & Sirens.

[Russell] Thanks for having me. Thanks for being gentle.

[Male Narrator] Are you looking for fast, accurate and official information that helps you to make informed decisions to stay safe during an emergency? The Department of Fire and Emergency Services Emergency WA app lets you set up watch zones for places important to you. So if an emergency happens in your watch zone, you'll receive alerts and warnings.

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[Female Narrator] That was Russell Turner on the rise of drones in emergency services. You've been listening to Mics & Sirens, the official podcast of the Department of Fire and Emergency Services in Western Australia. Follow the podcast and share it with others who want to know more about the developments in emergency management. Next week, Emma Conway takes us inside AFAC's electric vehicle fire program, and the fight to stay ahead of dangerous lithium-ion blazes.