Cutting-edge design puts fires out faster

You could say that flying was in Jason Schellaars blood from a very early age. Fascinated with aircraft and how they worked, he spent every free moment building model planes and helicopters. In fact, his passion for flying burned so deeply, he was intent on becoming a pilot and making it his career.

Jennifer Swaine

Jennifer Swaine is a communications consultant including to Regional Development Australia, Sunshine Coast; Chair of the Sunshine Coast Business Awards; Vice President of the Sunshine Coast Chamber Alliance; and a Non-Executive Director of Visit Sunshine Coast. She is also a regular columnist in the *Sunshine Coast Daily* and *Hello Sunshine*.

But life has a funny way of getting in the path of well-laid plans and, instead of following his passion for flying, Jason was encouraged to get a 'real job' and so opted to study engineering.

However, his love of aviation never left him and at the age of 27 he gained his commercial pilots' licence. He worked hard and knocked on many doors in a bid to make it his career and was rewarded in 1999 when he landed a role with a major Queensland-based aerial agricultural and firefighting operation.

As this operator expanded its operations over the ensuing years, fitting its helicopters with tanks that would allow them to fight bushfires quickly and efficiently from the air, Jason gained experience and insights into the impact a helicopter, laden with water, could have on a fire due to its speed and agility. However, he also came to recognise that the tanks on the market had two apparent problems.

The first one was the limited space underneath a helicopter where you could affix a tank. This meant that an aircraft was only carrying the water the tank could hold – and not necessarily the load capacity of the helicopter.

The second problem was to do with 'head pressure'. As the water was released, any remaining water at the edges of the flat tank flowed at a slower speed as the load emptied. The effect of this was a reduction in the impact of the full force of water onto a fire.

The years studying engineering were about to pay off as Jason turned his hand towards finding a solution that could solve these two important issues.

Jason knew there had to be a better and more efficient means of delivering greater quantities of water to the fire on the ground, and in 2004 he left his job as a commercial aerial firefighting pilot to concentrate on developing the initial designs as a base to build and test his theories.

▼ **Jason Schellaars fitting the Helitak fire tank to the Bell 214ST airframe.**

In 2006 Helitak Firefighting Equipment was born and was officially launched onto the world stage a year later at the HIA Heli Expo. The timing of the Expo coincided with the delivery of the first commercial Helitak Fire Tanks to the US, which were designed for the Sikorsky S-58T and S-61.

'The Helitak formula is to provide an expandable water tank that provides the operator with the availability to lift as much water as the aircraft is approved to lift,' founder Jason Schellaars said.

'By comparison, the volume in our competitors' tanks is limited to the space available between the floor of the airframe and the ground and not what the helicopter is actually allowed to lift.

'Additionally, the design and shape of the expandable tank provides a "head pressure" or "mechanical force" that means the water wants to leave the tank as quickly as possible, which in turn provides the best possible impact to the fire on the ground.'

To prove his point Jason said: 'An example of this is the Black Hawk and Super Puma tanks. They can deliver a full-load water drop of 1,100 gallons of water and retardant in around 4.5 seconds. This is pretty much unmatched in the aerial fire suppression underbelly tank world.'

Every Helitak tank is custom built and has a carrying capacity that ranges from 250 to 2,645 gallons of water and the carbon-fibre design means there are no modifications required to the aircraft.

Refill time is also kept to a minimum using the Helitak-manufactured hover pumps which provide a refill of less than 30 seconds for the HP2000 on the smaller tanks and less than 50 seconds for the HP6000 on the Black Hawk and Super Puma tanks. To fill the Helitak Chinook CH-47 fire tank with 10,000 litres with the HP10000 would take less than a minute.

The innovative design and technology behind Helitak's expandable water tank quickly drew attention from all over the world and in 2009 The Helitak Fire Tank was featured on the Australian Broadcasting Corporation's 'New Inventors Program', taking out the winning design and 'People's Choice' awards.

In October 2020, Helitak Firefighting Equipment added another trophy to its stable, taking home a national award at the Australian Technologies Competition, which is aimed at identifying and accelerating 'Australia's best "deep tech" scaleups'.

▲ **The Helitak FT4500 UH60/S70 Fire Tank dropping 1100 gallons in 4.5 seconds.**

▶ **The FT4500 on California based High Performance Helicopters UH60A.**

'Winning the Disaster & Emergency Award was incredible,' Jason said. It has created opportunities for us, but importantly connected us to a wide mix of people and organisations who, in a true collaborative environment, provided invaluable advice and guidance on overcoming some of the challenges faced by businesses as they grow and scaleup.'

The work Helitak is doing in the firefighting space has seen it successfully apply for and been awarded two grants totalling $600,000 over the past two years.

In 2018, Helitak secured a grant for $100,000 through the Qld State Government 'Ignite Ideas Fund', to finalise the design and global marketing of the FT4500 UH60/S70 Black Hawk Fire Tank and in 2020 the company secured a further $500,000 through the Australian Federal Government's Accelerating Commercialisation Grant to design, manufacture, certify and globally market the Helitak FT4250 Super Puma Fire Tank.

▲ **The Helitak FT4250 Super Puma tank displayed on the Airbus Helicopters Stand at Heli Expo Anaheim 2020.**

◀ **The retracted tank profile is only 12 inches or 300mm when landed or ferrying empty.**

From their early beginnings, the team has quickly expanded and now design and develop fire tanks for the Airbus H125/AS350 Squirrel, the Bell Medium range and more recently the Bell 214ST, the Sikorsky UH60/S70 Black Hawk and the Airbus Super Puma airframes.

Three new airframe tank designs are currently in varying stages of development with at least two due for release later this year, which are being built to cater for the newer rotary airframes coming onto the aerial firefighting scene. In conjunction with two of the major helicopter manufacturers, Helitak is again working towards providing an option that requires no major airframe modifications, which ultimately saves the operators additional modification costs and hastens the transition of installation and removal.

Research and development is something Jason and his team are committed to as they evolve the technology to aid in accurate and faster dispersal of water onto bushfires. And while the Helitak FT3500 Bell 214ST tank is certified and has been working the Australian Bushfire seasons since 2019, the team are currently in the final stages of FAA Supplement Type Certification (STC) of both the Black Hawk and Super Puma tanks, meaning both will imminently be available to both government and civilian operators around the world, offering an airframe/tank capability of delivering up to a 1,100-gallon payload – 55% higher than the accepted Type 1 minimum requirements of 700 gallons/2,653 litres.

Helitak now exports its tanks all over the world including to Europe, Canada, USA, New Zealand, Australia, Asia and South America and in November and December last year alone they submitted tenders to fit out 13 Black Hawks in many of these countries.

As demand for the company's product increases so too has the team at Helitak. Now employing 15 people and, with plans to further increase that head count, the Helitak team is made up of experts in engineering, design and drafting, composite construction, machinists, electricians, specialist welders and avionics in addition to the management team.

Based in Noosa on the Sunshine Coast, Helitak proudly manufactures the tanks and completes the full production of the tank in house. This includes design, prototype testing, composite construction, assembly, mechanical and machining, electrical installation, load testing and QA testing.

Jason proudly also shares that he is committed to being a true Australian manufacturer and sources over 92% of all components involved in the construction of the tanks within a 50km radius of their facility.

'The quality of our suppliers in Australia is second to none and it makes me very proud to do my part to contribute to the economy and to create jobs in the region. For this reason, I will always buy my components locally wherever I can,' Jason said.

Perhaps it was fortuitous that Jason was guided down the engineering path in his early years, as surely his knowledge in this area, coupled with his passion for aviation has resulted in the creation of one of Australia's leading success stories in the fight against bush fires.

For more information, go to www.helitak.com.au