HR Smith

We have the questions; Jake Ford, HR Smith's Head of Business Development, has the answers.

HR Smith was founded in 1965 and remains an independent family-owned business. How does this give you an advantage in the aerospace sector?

It's the efficiency, adaptability, and control we have over projects. Our philosophy prioritises in-house capabilities. With independence from shareholder interests, we continually invest in our facilities and capabilities.

Today, we're a fully vertically integrated business, handling design, manufacturing, and testing under one roof. This approach ensures quality and consistency are paramount, enabling us to deliver superior products on short lead-times and within budget.

As a family-run business in the aerospace sector, we're a rarity. Our independence preserves the qualities that make us successful.

The infamous orange bowl – it's a familiar sight on offshore helicopters, but what exactly is the 503-16 Crash Position Indicator or CPI?

It's a great marketing tool for us! As you say, it's visible on the tail boom of almost all offshore helicopters and you can usually spot at least five times when flicking through an edition of *RotorHub International*. Essentially, the CPI is a 406 MHz distress beacon. It automatically deploys from the aircraft,

floats on the ocean's surface and transmits distress signals, including the crash co-ordinates, via the Cospas-Sarsat satellite network.

This rapid transmission enables search and rescue (SAR) authorities to swiftly co-ordinate rescue efforts.

While it's occasionally referred to as the more complex "automatically deployable emergency locator transmitter" (ADELT), its primary function remains straightforward and crucial for ensuring aviation safety.

Given the demanding conditions of offshore operations, what specific engineering enables the 503-16 to endure the harsh offshore environment?

The certification requirements for this type of system are some of the most stringent for aircraft.

To ensure compliance, we utilised our vertically integrated approach, which meant that every step of the CPI's development, from design to manufacture to testing, was meticulously overseen and controlled in-house.

Our in-house testing facilities put the CPI through its paces, subjecting it to comprehensive environmental and mechanical testing.

Of course, any distress beacon is only going to be effective if it is turned on and deployed. How is the beacon activated?

When designing activation and deployment mechanisms for the CPI, we had to account for every possible crash scenario. Consequently, we developed five methods of deployment:

Manual – enables pilots to activate and deploy the CPI if they feel the need to alert the SAR.

G Switch – the G-sensor will detect a crash and deploy the CPI. Our CPI is equipped with accelerometers that detect changes in pre-programmed parameters that are indicators of a crash. When these parameters are met, the CPI is automatically deployed.

Water Switch – in a ditching scenario the system's water switch triggers the

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beacon to deploy.

Frangible (Crush) Switch – in the event of an impact, an external switch on the aircraft will deploy the CPI.

Hold Off Loop – in a scenario where the tail boom breaks off from the aircraft, the Beacon Deploy Control (BDC) will detect a break in the circuit loop and deploy the CPI.

The latest CPI variant boasts a memory module in the beacon to store FDR and CVR data. How did this evolve?

The aerospace sector is increasingly focusing on improving the recovery of flight data, a topic emphasised in the 2019 ICAO GADSS report.

Traditional Flight Data Recorders (FDRs) and Cockpit Voice Recorders (CVRs) have been pivotal in accident investigations since the 1960s, but their reliance on physical storage on aircraft poses difficulties in recovery.

To overcome these challenges, we evolved our standard CPI beacon and equipped it with a Memory Module, enabling secure storage of CVR audio and FDR data within a deployable beacon.

This innovation enhances crash investigation capabilities by providing a copy of the flight data in a buoyant, watertight and flameproof package.

By integrating this with the 406 MHz Cospas-Sarsat transmission, this ensures swift and accurate location data retrieval, further aiding investigators. ∎