Where failure’s no option

Barrie Bardoe

TWO Navy lieutenants are playing key roles in ensuring the ADF’s helicopters are safe.


Their work is essential to delivering safety and capability, with failure definitely not an option.

“Consider a paper clip that is bent back and forth a number of times,” LEUT John said. “The cumulative fatigue stress will eventually cause the metal to weaken and break.”

For helicopters with their many moving parts, this principle is especially important as it ensures the aircraft is safe and avoids catastrophic failures.

“Helicopter structures are subjected to fatigue stress by flexing under aerodynamic loads and cyclic vibrations from rotating components such as gears and rotor blades,” LEUT Sethi said.

“When a helicopter is designed, the manufacturer assumes it will be flown a certain way for a certain period of time. The components are tested in labs to determine their design loads and then tested in-flight conducting various manoeuvres.”

“Combining these steps allows the manufacturer to determine a safe operating life. At the end of this life the component must be replaced.”

The key to keeping helicopters safe, he said, was to monitor how they were being used in real conditions.

“By analysing the actual usage of ADF helicopters, HSI-DGTA can determine if the manufacturer’s expected safe operating life is applicable,” LEUT Sethi said.

“If the actual flight manoeuvres are more extreme or usage exceeds this, the replacement time for affected components is reassessed and, if necessary, reduced to account for the increased fatigue stress and decreased safe life.”

LEUT’s Sethi and John admit their jobs are challenging as the pressure to get it right is ever present.

“This job has built-in stresses because your analysis and outputs assure continued safety of flight.”

LEUT Sethi said. “It is minimised through continually aiming at seeking out opportunities for improvements. “These include improving systems used to capture flight data, and having more specific manoeuvres to make it easier for pilots to remember and have input.”

“Another area we are exploring is producing software to analyse flight recorder data which are installed on certain legacy platforms. “We have noted greater efficiencies using this software when compared to older methods. It has potential to be mapped across to new platforms.”

For the HSI team, success is often measured by what doesn’t happen.

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LEUTs Vincent John and Nishchol Sethi inspect a previous generation of helicopter technology at the RAAF Museum, Point Cook.

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