Protecting the marine environment: the Arriel engine in action

The United States Coast Guard (USCG) deploys over 100 MH-65C Dolphin helicopters for some of its most demanding missions. They are all powered by twin Arriel 2C2-CG turboshaft engines from Safran Helicopter Engines. Meeting the highest standards of reliability and robustness, this engine also shows its full performance capabilities on demanding missions like the one recounted here, of unmasking ships that pollute our seas.
Clouds over San Francisco

It's nine o'clock in the morning, and clouds have invaded the sky over northern California. Some are about to touch the towers in the famous Golden Gate Bridge, spanning San Francisco bay between the City and Marin County. In other words, visibility is limited!

Back at the San Francisco base of the US Coast Guard (USCG), a four-man crew heads towards one of their MH-65C Dolphin helicopters, built by Airbus Helicopters. The US Coast Guard is tasked with operations such as Search & Rescue (SAR) at sea, port security and protecting the marine environment. The local USCG base is on call 24-7, to cover nearly 350 miles (555 km) of coastline, from Point Conception to Fort Bragg.

Takeoff for a mission over the Pacific

Steve, the lead officer on this operation, takes the controls, alongside Andrew, his co-pilot. Behind them are the hoist operator and the rescue diver. Powered by twin Arriel 2C2-CG turboshaft engines from Safran Helicopter Engines, each developing 839 shaft horsepower (shp) at takeoff, the four-ton helicopter is airborne in just a few seconds.
Steve knows how important it is to be able to count on this **power reserve** for certain maneuvers, especially when operating the hoist. He has already led several rescue operations to save people from shipwrecks in heavy seas.
Tracking sea polluters

Today, the crew isn't on a rescue mission. Instead, they will be hunting down ships that pollute the sea. Some oil tankers and other ships feel free to dump waste products at sea, which is illegal.

This means discharging the boat's holding tanks, often including oily sludge. The upshot is massive pollution in our ecosystems, poisoning flora and fauna and soiling beaches and water. It's one of the major problems facing coastal regions.

Today's mission is designed to catch any guilty boats red-handed. But first our crew has to get to the assigned zone, and that's where the Arriel 2 engine really comes into its own. It's more powerful than previous-generation engines, with each one developing 779 shp during cruise to give the helicopter a top speed of 173 knots (320 km/h).

As the helicopter climbs to cruise altitude, Andrew briefs his crew:

We're going to be making a reconnaissance flight off the coast of Santa Cruz, out to about 43 nautical miles. It's possible that some unscrupulous shipowners will take advantage of this bad weather to dump their waste.

Once they reach the assigned sector, the helicopter will patrol the main offshore maritime route at low speed. His co-pilot adds,
If there's an oil slick, our radar will see it, because oil flattens out the waves a bit.
Safe flight

Despite the turbulence and the black clouds announcing a coming storm, Steve maintains his heading. They're flying over a constant stream of traffic on the maritime highway, including tankers and container vessels.

What's the fuel gauge say?

asks Steve, and his co-pilot assures him that the tank is still almost full.

The full authority digital engine control, better known as the FADEC, is playing its role to perfection. This digital system helps the pilot control acceleration and deceleration, as well as fuel consumption. The result is a very economical propulsion system that reduces the total cost of surveillance missions.
Polluter in the crosshairs!

The helicopter has been flying for nearly two hours. As it continues to scan this offshore sector, the crew spots an oil slick, extending several hundred yards behind a tanker that seems to be running full steam ahead.
Let's drop down and make a very low speed pass

says Steve. He asks the hoist operator to take photos of the ship from different angles, and then asks co-pilot Andrew to radio the ship's coordinates back to HQ, so a coast guard cutter can intercept and inspect the culprit.

To clearly see its registration number and other characteristics, the helicopter moves closer to the offending ship, just a few yards above the sea surface.

The pilot knows that he can count on his **highly reliable twin engines** to perform maneuvers like this in **total safety**.

**Mission accomplished: back to base**

The polluting vessel will shortly be intercepted by a Coast Guard cutter, which means that the mission is over for the MH-65C Dolphin crew. After a last flyover of the ship, the pilot heads back to home base, where the machine will be immediately readied for the next mission.