ISOTTA FRASCHINI

BACK TO THE BASIC

ISOTTA PRESIDENT SERGIO RAZETO SAID:

The company's strategy is to create an Innovation and Development Centre, integral to Isotta Fraschini Motori.
Three projects are in the oven.
1) Back to basic: restore Isotta Fraschini's original quality, detect and resolve engine defects (starting a year from the Centre establishment);
2) An industrial generator engine with existing thermodynamic characteristics but novel accessories. We will apply modularity and comply with communality systems, with the same components on 8, 12 and 16 cylinders. The idea is of a base engine on which standardised packages are implemented, according to emission requirements (two year timeframe).
3) A newly designed engine block, with novel bore and stroke, ranging between different fuels, dual and gasified, for applications integrated with fuel cell, hybrid, batteries, wind fields, photovoltaic.

Alberto **Maestrini**, General Manager of FINCANTIERI: «*Within the next five years we must have entirely new products, perhaps niche products, but as leaders. The demand of electrical production is increasing, both in the military and cruising sectors, and Isotta Fraschini must play a key role*»

Isotta Fraschini has delivered diesel generators to the Italian Navy. The 16 cylinders, completely redesigned with an anti-polishing ring, gives new impetus to Isotta Fraschini, as they set up an R&D centre in order to restore the brand's original quality, modernise the existing platform and embark on a new industrial engine

The 16V170C2 is the result of the partnership between Isotta Fraschini and Fincantieri. This application, a multipurpose offshore patrol vessel (PPA) for the Italian Navy, is the starting point of a far-reaching strategy. The message coming from the headquarters in Bari (Italy) is that Isotta Fraschini will always remain a strategic asset for Fincantieri and will most likely become a player in the nautical sector and PG in the next decade. The diesel generator for the offshore patrol vessel has been redesigned to comply with the requirements of the Italian Navy, with 3700 validation hours: 1400 in motion for the prototype (crankcase, power and turbo line, oil cup, hydraulic circuits), 1200 with the new engine (auxiliary systems and hydraulic circuits, rpm check, automation and monitoring, SCR), 1100 hours in motion for the final validation with SCR. Gianluca **Piscopo**, head of design, illustrates the project.

Where does the match between Isotta Fraschini and this PPA come from?

For the PPA we presented the 170 mm bore, 16 cylinder engine of the 1700 series, already known to the Italian Navy as it is used on FREMM and Orizzonte. We established a team bringing together Isotta Fraschini, Fincantieri, Italian Navy, NAVARM and OCCAM, which followed the development of the diesel generator and made sure it complied with the requirements. Right from the beginning all stakeholders had defined all validation processes.

Why this engine?

In our family the 16V170C2 reaches the target of power and MTBO, and therefore the maintenance timeframe. Amongst the requirements were both annual hours of use and type of load. The electric power demand on the PPA is considerable (as a consequence, amongst other things, of the presence of four radar installations). On applications such as FREMM and PPA the diesel generators are used for propulsion. The main load is not due only to the auxiliaries, but also to the propelling motors (FREMM) and manoeuvre engines (PPA), which provide the greatest transients, because with normal usage the boat remains steady in terms of power load and the transients are mild. The heaviest conditions are reached in manoeuvre.
Despite the required nominal power being equal, 1,600 kWe, on PPA and Orizzonte (although the latter displays mechanical injection), the duty cycle on a PPA is tougher, because on Orizzonte the diesel runs on average at 50% of load and endures far less transients.
This has prompted us to deeply revise the engine. The crankcase is different and the pistons are sill made of steel but designed to work with a sleeve featuring an anti polishing ring, a device that prevents carbon deposits on the piston from polishing the sleeve, reducing its life.

Other features of the 16 cylider?

It has no EGR, since the IMO Tier 2 does not require it, and it has a Bosch 1,600 bar common rail. We expect a future transition to 2,200 bar. EGR and SCR are both compatible with IMO Tier 3. We chose the latter solution, thanks to the collaboration with IFOG Engineering, because of the engine reliance and its efficiency which renders recirculation useless. It is a solution of industrial origin, with 40% urea solution. On the PPA the SCR doesn't have to always be active. DOC and DPF are not required.