



CAF rolls into super high-speed with Oaris

With this month's launch of the Oaris, its first 300km/h high-speed train, Spanish manufacturer CAF has joined an elite group of manufacturers offering all types of passenger rolling stock. Kevin Smith previews the latest entrant to the high-speed train market.

SPANISH train manufacturer CAF has in the past supplied rolling stock to a wide range of railways around the world. From metro cars in Washington DC, Hong Kong, Mexico City and Algiers, to 250km/h emus for Turkish State Railways, and LRVs and commuter trains for its native market, the company has built a strong international presence over the past 150 years. Now CAF is looking to expand its horizons further with the launch of its first 300km/h high-speed train, the Oaris, which the company hopes will firmly establish it as a major player at the top end of the market.

Oaris will be central to CAF's efforts to beat Alstom, AnsaldoBreda, Bombardier, Siemens and Talgo to win the €270 million tender issued this month by Spanish passenger operator Renfe for 10 high-speed trains for the new

Oaris key statistics	
Train length	202.2m
Train length in double composition	403.9m
Driving car length	28.6m
Intermediate car length	24.8m
Floor height	1.3m
Wheel diameter	0.92m

Madrid/Barcelona - Paris international service (IRJ January page 8). The company also intends to bid to supply rolling stock for the new São Paulo - Rio de Janeiro high-speed line when a tender is announced early next year, potentially manufacturing the trains at its São Paulo plant which opened in March. It is similarly targeting a bid for the proposed improvements to the United States' Northeast Corridor from Boston to Washington DC, with Amtrak aiming to purchase 25 high-speed trains over the next 10 years. If it secures an order, CAF will manufacture Oaris at its plant in Elmira, New York.

Intended to serve both high-speed and conventional routes, Oaris can be supplied in four, six, or eight-car configurations. The train has a modular interior with interchangeable seating arrangements and services depending on the operators' needs. These include toilets and luggage areas which can be altered depending on the number of seats on the train. Onboard catering facilities can also be expanded while intermediate coaches are designed to accommodate two or four doors. The trains have the capability to supply an Ethernet network that broadcasts audio and video information as well as provide log downloads during maintenance work. Installation of a WiFi network to provide internet access to passengers is also possible.

Reliability

CAF has placed high reliability at the centre of Oaris' design. The bodyshell is composed of extruded aluminium which combines minimal weight with structural strength and crashworthiness and, while exhibiting an aerodynamic profile typical to all high-speed trains, the body is designed to minimise internal and external noise caused by crosswinds, also solving the problem of coach air-conditioning intakes and outlets. The air-conditioning system is situated on the roof of the train, while the train uses a varying number of

auxiliary generating units, which have capacity to supply the whole train if one unit fails.

Each vehicle is equipped with a motor and trailer bogie to aid traction, with primary suspension based on coil springs on elastic supports, elastic guiding joints and vertical dampers. Secondary suspension and car-body bogie connection utilises a pivot with elastic connecting rods, air springs, anti-roll bar, anti-sway dampers and progressive side buffers. The traction motors are mounted on a frame that is in turn attached to the bogie frame by elastic parts and dampers.

Braking is both electric and pneumatic and includes regenerative, rheostatic and blended capabilities. The pneumatic equipment is based on one compact unit per bogie, including electronic/pneumatic and anti-lock equipment, so that all axles are equipped with an anti-skid mechanism. Wheel disc brakes are positioned on each bogie with trailer bogies suitable for the addition of an extra brake disc on each axle.

Much of the Oaris equipment is capable of supporting cross-border interoperability. There is a gauge-change option between 1435mm and 1668mm, while the trains are also compatible with multiple signalling systems including ERTMS Level 2 as well as country-specific systems. Pantographs are able to supply two transformers of differing design and features depending on the power supply, and the train is designed for operation on 1.5 and 3kV dc, and 15 and 25kV ac systems.

With this flexibility and its modern passenger-friendly layout, Oaris is likely to put CAF in a strong position in its upcoming bids for new high-speed rolling stock contracts. **IRJ**

Top to bottom: interior views of first-class accommodation; end vestibule area; the catering vehicle which can be adapted to meet the specific needs of individual customers.

