

Level 2 rolls out across the Rocade Nord

RESIGNALLING Following a project review earlier this year work is in full swing to install ERTMS on three sections of Algeria's east-west main line linking Oran with Annaba.

Abderrahmane Belkadi, M'Hamed Nedjari, and Amar Aouati*

ANESERIF

Next year is due to see the entry into revenue operation of ETCS Level 2 train control on three sections of Algeria's east-west corridor. As part of its programme for modernisation and expansion of the national rail network, infrastructure manager ANESERIF expects to complete the roll-out of ERTMS across the entire corridor within two years.

The Rocade Nord linking Annaba, Constantine, Alger and Oran is Algeria's principal main line. The route is currently being electrified at 25 kV 50 Hz under a national investment programme approved by the government in 2007 (RG 4.07 p205). Single-track sections are being doubled, and in some cases heavily rebuilt to improve the alignment.

Having considered a range of options for signalling the upgraded route, ANESERIF decided to adopt ERTMS as the best technology available 'off-the-shelf' from a range of suppliers. ERTMS is expected to deliver significant benefits in terms of improved capacity, optimised operation, greater efficiency in maintenance, safe movement of trains and better protection for staff working on the track.

Contract scope

At the end of 2007 agreement was reached for a consortium of Thales, Vossloh-Cogifer and CSEE Alger to equip three sections of the Rocade Nord at a cost of €268.5m. These are Annaba – Ramdane Djamel, El Gourzi – Bordj-Bou Arreridj and El Khemis – Oued Sly. Together these total 440 route-km of electrified double track and 30 stations. The existing signalling is based on absolute block working, with only one train in each section. The installation of train detection systems and intermediate block points will increase capacity.



PHOTOS: ANESERIF

The lines are being equipped for full bi-directional operation, with signalling and crossovers to enable 160 km/h running in both directions on each track, providing operational flexibility. As the Rocade Nord will be used by both fitted and non-fitted trains, ETCS will operate in parallel with conventional lineside signalling.

Reflecting the long distances and limited support infrastructure, train detection for both plain line sections and stations will be undertaken with axle-counters, using GSM-R as the communications backbone. The existing track circuits in station areas will be removed.

Under the contract announced in January 2008, the consortium is supplying ETCS and GSM-R equipment, computer-based Traffic Control Centres, and electronic interlockings, as well as the train detection system. These will be integrated via a Synchronous Digital Hierarchy communications network, using open protocols and carried on high speed optic fibre rings. As well as supporting the ETCS

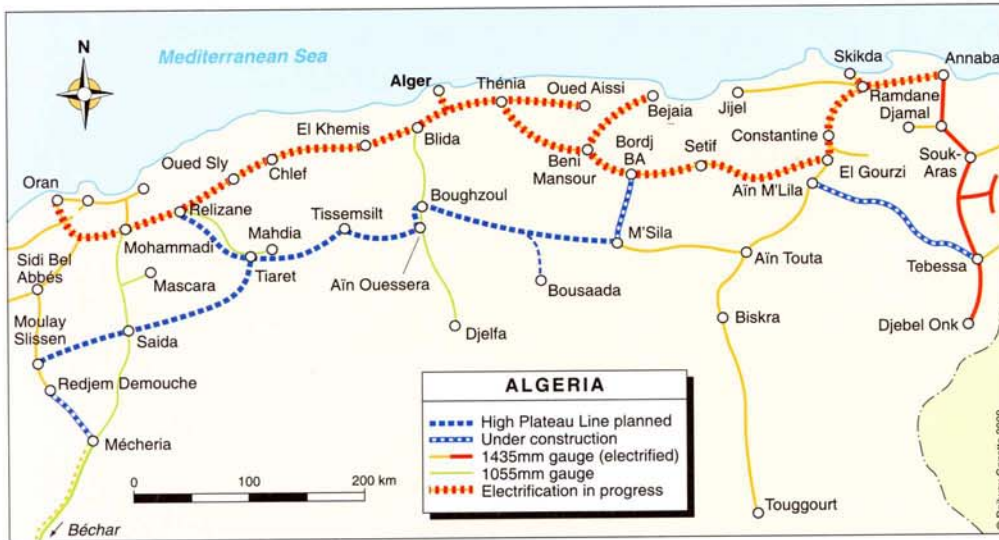
Tenders are being called for supply of ETCS on-board equipment on both diesel locomotives and SNCF's CAF-built inter-city trainsets.



data services and axle-counter train detection, the GSM-R communications network will handle voice radio and emergency communication between track and trains.

* **Abderrahmane Belkadi** is Director-General of Algerian infrastructure manager ANESERIF (Agence Nationale pour la Réalisation et le Suivi des Investissements Ferroviaires). **M'Hamed Nedjari** is Director, Signalling, Telecoms & Energy, and **Amar Aouati** is ERTMS Technical Adviser.





Project review drops Level 1

Earlier this year ANESRIF undertook a review to assess the rationale underlying its initial choice of ERTMS against the current state of development. We felt that it was essential to consider whether any changes to the strategy or technology were needed ahead of installation, so that these modifications could be incorporated into the system design as soon as possible.

Our review drew on the lessons learned from ERTMS projects across Europe, ongoing work at the European Railway Agency, and the broad acceptance of Level 2 as a proven technology. The review concluded with a meeting on May 20 attended by senior ANESRIF management, key representatives from Thales and the consortium, plus the regulatory authorities and project managers overseeing the Rociade Nord upgrading. This agreed to a

number of significant amendments to the programme.

The resignalling was originally contracted on a three-layer basis, using ETCS Level 2 with Level 1 as a back-up, plus lineside signalling for unfitted trains. As Level 2 has now been fully validated and is in commercial service on several main lines across Europe, we concluded that Level 1 was no longer required. The lineside signalling would provide an adequate fallback, while avoiding the risk of interference between the Level 1 and Level 2 systems. This should avoid unnecessary expenditure, and will help to ensure timely delivery.

There is a general recognition that the changes will bring stability and coherence to the project, and ensure that it is achievable. The updated design has been fully endorsed by all those responsible, and delivery and installation are now well underway.

communication paths between the GSM-R network elements as well as between the RBCs and the Traffic Control Centres. Other built-in capabilities include provision for regulating and supervision at alternative sites in the event of technical incidents affecting the main control centres.

The uniform application of ETCS Level 2 over all three sections should greatly simplify the design and implementation. At the same time we will be harmonising the operational rules to take advantage of the sophisticated train supervision which ERTMS can deliver. The installation will be based on the approved European SRS version 2.3.0d, but with provision for upgrading to version 3.0.0 to ensure forward compatibility as SNTF's train fleet is progressively fitted with ETCS on-board equipment.

Commissioning and roll-out

The first section to be commissioned under Level 2 supervision will be between El Gourzi and Bordj Bou Arreridj, where GSM-R voice data testing is scheduled to begin by the end of February 2010. Full-scale testing of the signalling is planned to begin in June, lasting three months.

Under a joint agreement between ANESRIF AND SNTF, a tender was to be called last month for ETCS on-board equipment to retrofit SNTF's diesel locomotives, with proven compatibility with Unisig Baseline 3 RBCs as a pre-condition.

The commissioning of a state-of-the-art computer-based signalling and train control system in such a short timescale effectively marks a 50-year leap in technology for Algerian Railways, which will clearly impact on railway operations staff and train drivers, so the change management strategy is very high on our agenda. Explaining the operational changes to the staff and training them to use the equipment is our top priority.

Following our review, we have a high degree of confidence that ANESRIF will achieve the full potential benefits from its investment in new signalling and train control technology. This is a major step in the massive Algerian railway investment and expansion programme. Once the resignalling of the Rociade Nord has been successfully completed, we envisage that it will pave the way for the approval of a comprehensive strategy to roll out ERTMS across all main lines in the national network. ❏

Resignalling work is already underway on the El Gourzi - Bordj Bou Arreridj line.



Contingency planning

Despite the decision to drop the Level 1 back-up, a full contingency plan remains a regulatory requirement, and ANESRIF must ensure that the signalling and train control remain available at all times. Contingency measures have been incorporated in the design, and will be reflected in the physical architecture.

To achieve the required availability, the ETCS Level 2 equipment will be fully redundant, with each section under the control of two RBCs at different locations. These will be connected to a dual GSM-R network giving independent and geographically-separate duplicate radio coverage.

The fixed transmission network has been designed to provide multiple