INFRASTRUCTURE PROJECTS IMPLEMENTATION WITHIN CRISIS CONDITIONS

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ABSTRACT
The infrastructure projects construction along the railway network after the bulgarian eu membership is related to a number of particularities. for the sections that enter into the european transport corridors is also insured a part of funding from the european institutions. the karnobat – syndel railway line electrification and doubling is carried out only by the state budget funding from the beginning till the present stage. the insufficient and irregular funding leads to a broken rhythm of construction and continuous demurrages that cause failures and technical problems stated in the present report.

Key words: Railway infrastructure, infrastructure projects, railway overpasses, tunnels, failures.

1. TRANSPORT IN CRISIS SITUATIONS
1.1. TRANSPORT SUPPORT DURING CRISES SITUATIONS.

The railway infrastructure construction in conformity with the European standards is an essential item for our country. The insured EU funding significantly supports the realization of our commitments and the high-speed track construction. The National Railway Infrastructure Company State Enterprise in accordance with EU Regulation № 1083/2006 is a Beneficiary on all the projects of first priority axis – the railway infrastructure development along the Trans-European and main national transport axes.

The bigger part of our railway lines are constructed more than 100 years ago with geometrical parameters, substructure and structures intended for up to 100 km/h speeds. The sections doubled during the last 30 years are also with limited speeds due to their geometrical parameters, condition of the substructure (foundation, embankments, and diggings), structures and track layout in the stations. The limited

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financial resources for track and structures repair within the last 15-20 years led to broken international cycles and as a result from that fact to a significant deterioration of their technical condition. The implemented rehabilitation program for 414 km track renewal has been performed for 9 years instead of the initially envisaged for the purpose 3 years always due to the limited financial resources.

Within the recent years for the railway infrastructure construction and modernization has been mainly worked on the implementation of infrastructure projects as Plovdiv –Svilengrad – Turkish, Greek Border Electrification and Upgrading and Karnobat – Syndel Railway Line Electrification and doubling that are part of the European transport corridors.

One of the priority projects for Republic of Bulgaria is the Karnobat – Syndel Railway Line Electrification and doubling project. The 123 kilometers section connects one of the most congested European transport corridor №8 (Varna – Bourgas – Plovdiv – Sofia – Tirana – Duras – Brindisi) with the Traseka corridor, connecting Europe and Asia (Black and Adriatic Sea) and is a connecting unit between 2nd and 8th highway railway lines of the Republic of Bulgaria railway infrastructure system. The section is the nearest railway connection between the big Varna and Bourgas harbors.

The aim of this strategic for the railways project implementation is finalization of the big doubled electrified railway ring Sofia – Mezdra – Gorna Oryahovica - Syndel (Varna) – Karnobat – Plovdiv – Sofia as well as the transport service to and fro Varna ferry complex.

The existing single railway line is with low technical parameters and hinders the North route disburdenment, deteriorates the combined freights transport as on North-South direction as well as between Varna and Bourgas harbors.

The section is situated in a mountainous area with a complex relief and unstable swaths. The track geometrical parameters and existing structures gauge clearance define the maximum allowable speed of 80 km/h in case of 85 km/h design speed. The unsuitable conditions are: bottlenecks, deep diggings, complex curves with a small radius and bypasses with short transition curves. At some places the bottleneck sections have for more than 30 years been under 24 hour's supervision.

The abovestated causes lead to a train operation speed reduction up to 40 km/h., and in some sections up to 15 km/h.

By the Project implementation the following is achieved:

- Shorten the section length by 11 km;
- Avoid potentially dangerous land-slides and bottlenecks along the existing railway line alignment, to which train operation speed "reductions" are given;
- Improving the railway line technical parameters in plan and profile;
- Increase the railway line traffic capacity;
- Increase the maximum allowable speed up to 130 km/h;
- Decrease the traveling-time as in Karnobat-Syndel section as well as on the whole direction Sofia (Plovdiv) – Karnobat – Syndel – Varna;
- Current maintenance operational costs reduction.

To the present stage 9 open lines with 71 km total length are constructed and put into operation. The most difficult open lines are left for implementation Lyulyakovo – Daskotna – Tranak – Asparuhovo – where the line crosses the main part

of Eastern Stara Planina Mountain. The difficult relief through which the railway line alignment passes requires construction of great number of engineering structures – 4 tunnels and 16 bridges.

The preliminary design envisages construction of 1605 m tunnel in Tranak – Asparuhovo open line. After a proposal for alignment change from km 73+087 to km 77+670 made by Transstroy – Varna, the site construction starts along a new alignment, crossing through Tsonevo Dam Lake by 3 railway overpasses instead of a tunnel.

Railway overpass 1 is from km 74+627 to km 74+867; it is situated in a curve. Initially it is intended for 210 m length however in 2004 due to security measures another hole is additionally constructed. The holes length is 30 m from pole axis to pole axis. The final length of Railway overpass 1 is 240 m.

Railway overpass 2 is from km 75+755 to km 75+965, with 210 m length, is situated in a straight line and passes over Tsonevo Dam Lake. Where the longest column of constructed railway overpasses is situated.

Railway overpass 3 is from km 76+550 to km 76+999, with 449 m length, is situated in a curve with R=800 m and also passes over Tsonevo Dam Lake.

The three railway overpasses are completely constructed, with laid track and catenary of track №2 in November 2007.

In the end of 2007 the train operation is reactivated in Tranak – Asparuhovo open line along track № 2 of the new alignment with 130 km/h design speed. By this activity the track length is significantly shorten and the traveling-time reduced in Karnobat-Syndel section.

In 2008 in the same section is also laid track № 1. It is envisaged from Struya halt duty point (through a railway switch with control and remote video control from Asparuhovo station) the train operation in Syndel – Varna direction to be performed along track №1, that will lead to a more uniform loading of the three railway overpasses. In relation to the fact is also envisaged reconstruction of the switches in Asparuhovo station throat, Karnobat side for which a definitive design is prepared.

The new doubled electrified railway line parameters for 130 km/h train operation speed are: minimal radius of the horizontal curves 800 m and maximal gradient (longitudinal cant) 15 ‰

The Karnobat-Syndel railway line doubling and electrification starts in the beginning of 1980. After 1990 due to the non-rhythmic funding, the different structures construction schedule is broken, construction works are performed only on the tunnels and railway overpasses.

The main part of the engineering structures has started and part of them even completed immediately after the design.

The terrain conditions require implementation of three tunnels (№№1, 2 and 3), two of which are totally completed.

The tunnels construction is unique and requires good and effective organization of construction-repair works performance as well as timely funding. In the tunnels construction beginning with ensured funding a progress of 25-30 m monthly prepared tunnel is achieved. After the severe financial resources restriction for the construction, after 1990 the work is decreased to 20 linear meters annually as only tunnel №2 has been timely put into regular operation.

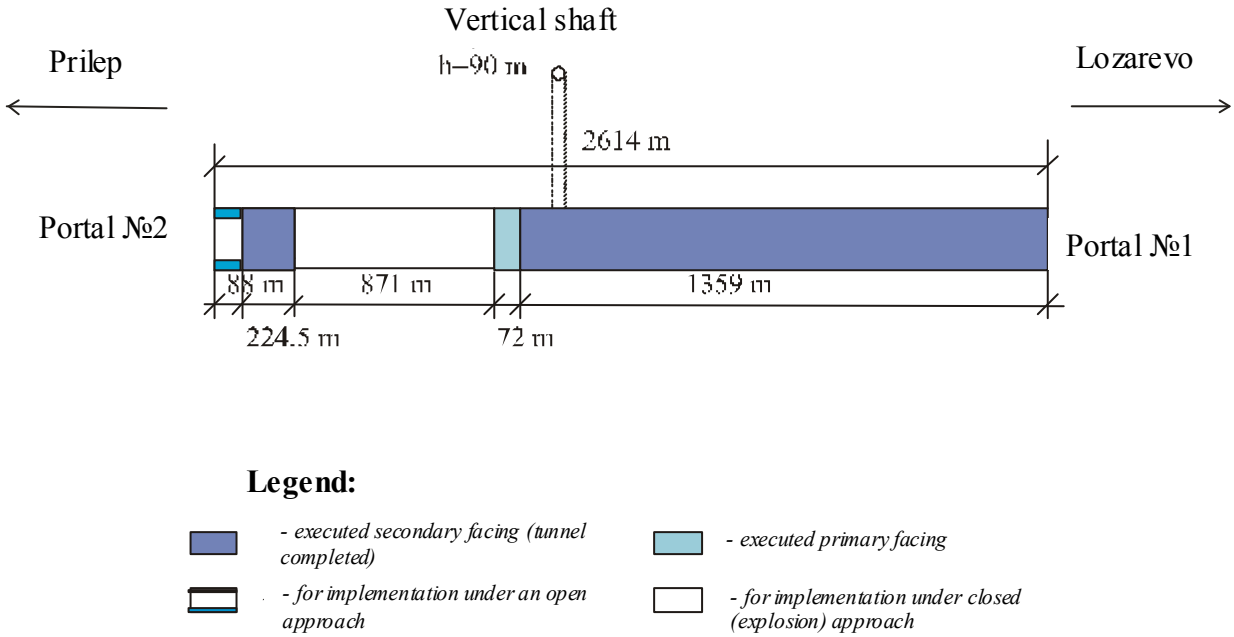
Tunnel №2 is situated in the Lyulyakovo – Daskotna section with 340 m design length. From several years is in operation.

Tunnel №3 is situated in Daskotna-Tranak section with 460 m design length. It is completed as structure without laid track.

Tunnel №1 is situated in Lozarevo – Prilep section. It is the longest double railway tunnel of the Republic of Bulgaria railway network and on the Balkan Peninsula with 2614 m design length and 125 м^2 miner section. By its construction only in Lozarevo-Prilep open line the alignment is shorten by 5 km. The structure has a limited significance for putting into operation the whole railway line and mainly defines the section construction value.

The Tunnel №1 construction started in July 1987 on both sides – from Karnobat side (Portal №1) and from Syndel side (Portal №2)

Tunel №1



I. Portal №1 – The tunnel is worked in a tectonic treated massif with underlined instability. It is worked under a principle design – digging according to an explosion method with an advanced block and reinforcement by sprinkled concrete (new Austrian method). Over 1 500 m tunnel is constructed. Around 800 m rocks are left for treatment.

II. Portal №2 – The tunnel passes through an area with very heavy engineering – geological parameters – plastic swelling clays, which hinder significantly the pass works and exert serious pressure on the permanent tunnel support. 224 m tunnel is constructed. The pass works are suspended compulsory in the fall of 2005, when an unforeseen underground waters breakdown happened. The face is entered into an emergency situation and is blocked by concrete and wooden support. In order to clarify the geological situation within the resting 150 m to the rock massif is carried out an additional engineering-geological study, which shows the necessity of new

design solution in this section. That leads to the supporting geodesic network bench marks displacement, which makes impossible the tunnel conduct on axis and level; the constructed tunnel is always flooded as result from the intensive showers. The tunnel flooding in the section is a precondition for heavy deformations of the tunnel structure. All the abovestated requires a change of the tunnel development technology – from one side, from Portal №1 side only. The initially envisaged installations (ventilation, power and water supply) are performed for 1200 m approximately, which is achieved in 2005 and exhausted all their possibilities. In order the tunnel development to continue is necessary a new design solution for the portal ventilation, as well as new high power supply of the machinery in the face. It is necessary a technical solution performance with vertical shaft construction in the middle of the tunnel and temporary kiosk switchgear on the surface for complete definitive solution of the two problems.

Till the Tunnel №1 final completion the following main construction works are envisaged: vertical shaft construction, with approximately 90 m height for communicational ensuring of the tunnel (ventilation and power supply); construction of 760 m tunnel in middle-rocks sediments according to a new Austrian approach; construction of 170 m tunnel in heavy engineering-geological conditions – Pliocene swelling clays with an underground waters high level; construction of 88 m tunnel under an open approach; portals construction; tunnel invert and drainage systems construction; pre-portal trench swaths supporting; Patomishka river correction (at the tunnel approach from Prilep side), including earth works, cascade dams and culvert; catenary's performance; train dispatching radio-connection; fiber optic cable; axle counter; superstructure and tunnel illumination.

In relation to the necessity of projects conformity with European railway systems interoperability requirements, NRIC SE assigned through a tender procedure the investigation of project condition and its actualization.

In accordance with the long-term 2009-2018 program of railway infrastructure development, the financial resources for Karnobat-Syndel railway line construction are planned for the period from 2009 to 2015 which means that to 2015 the construction works shall be completed. Unfortunately in connection with the financial crises the NRIC SE financial resources have been significantly reduced. That led to the long-term development program revision.

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