Testimonial Statement

Product: TUnIS.moving station | Project: Brasov Sighisoara Railway

The science of tunnel navigation is an area of technology that over the decades has moved from the simplest of surveying techniques to the modern complex IT supported systems we have today. VMT has always been at the forefront of such developments and has recently introduced the latest innovation TUnIS.moving station.

Q: Why did you choose TUnIS.moving station as assistance system to the main navigation system TUnIS Navigation TBM^{Laser} – were there alternatives / competitive solutions?
A: Reliability, that's the first reason VMT has been chosen. VMT Tunnel Navigation systems have proven themselves reliable and steady within any kind of tunnels I have worked in. Hereupon improvement of tunnel surveying perspective and adaptation to new requirements in tunnelling is always at company's agenda. VMT Navigation system updated with moving station became the most convenient Tunnel Survey System. In my case, at "Brasov Sighisoara Railway Project" in Romania, TUnIS.moving station is beyond than assistance system. Due to structural complexity of TBM's there no other Survey-Navigation system could be an alternative.

Surveyor Manager Ali Kemal Oztur

Q: Which were the main arguments with which TUnIS.moving station could convince finally?
A: There wasn't any argument necessary to convinces us: system functions are clear, results are evident.
Reducing of working time and simplicity of procedure were beyond my initial thoughts. Accuracy is also accomplished for requested precision. So now planning to transfer remaining two machines, not only the advantages mentioned above and cost reduction for project have been significant. Relocation of manpower for remaining activities became easier and effective.

Q: Could TUnIS.moving station generally fulfil the expectations – did it perform like it was expected/ordered/bought?
A: VMT Systems exceed my expectations, consistent improvement of systems fulfils all requirements, personally and professionally.

Q: Which were the main benefits that the system delivered → are there any "hard figures" that show/proof the benefits like cost reductions, reduction in staff/time etc.?
A: Narrow Survey Laser Window was our concern, due to structure of TBM and equipment placed at the gantries, Total Station bracket could not be installed as supposed to be in best position.

- Moving Station cleared this issue definitively.
- Almost "zero" cost of consumables for the total station consoles maybe sounds small but almost half cost of Moving Station at 24 km of tunnels.
- Moving forward of spherical targets can be done with Junior Surveyor. Lead Surveyor tasks can be reoriented for supervisory controls.
- Total number of TBM Surveyor was decreased to 4 from 7, in 4 TBMs.
- Duration of each TBM survey work was reduced from 2 hours to 25 min. in daily basis.
- Heavy labour for Total Station installations is no longer necessary.

> "Due to the structure of the TBM and the equipment placed at the gantries the narrow laser window was a great concern. Thanks to TUnIS.moving station, however, this challenge was successfully overcome."
>
> Ali Kemal Ozturk, Surveyor Manager at Aktor

Q: How do you judge the collaboration with VMT: in negotiation & consulting phase, during implementation, during the project?

A: Initial communication was helpful and creative. VMT's international Know-How helps to improve our vision. Implementation and operational support were swift, and all our requests were fulfilled promptly and to our satisfaction.

Q: Were there any advantages in workflow (synergy effects) in using several VMT products in the project – in terms of functionality/support etc.?

A: VMT's approach for solutions and ease of understanding the systems help deliver the project as intended.

Q: Do you have any proposals for improvement of our technologies?

A: I am only looking forward to seeing the new improvements.

Q: Would you opt again for TUnIS.moving station and VMT as partner?

A: I would very much prefer to work with VMT systems in the future and do not hesitate to recommend them to all who are looking for reliable and steady Tunnel Survey Systems.

Q: Any further comments?

A: Observations

- Increasing the numbers and distribution of spherical targets enhance the precision of positioning.
- Specially in sharp curves, limitation of "Survey Laser Window" and frequently shifting total station bracket have been eliminated.
- Fixed position of total station prevents unintentional hazards of instrument compared to bracket installation.
- Easier and safe work.
- Orientation of TBM Operator for the new system was short and easy.

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