


#	<p>George Leoutsakos (Mechanical Engineer, MSc, DIC, PhD.)</p>	
Title:	E/M systems manager	
email:	gleoutsakos@ametro.gr	
Presentation title:	<p>Advanced System Architectures and Operational Methodologies Leading to Energy Efficient Operations in the new Metro Line 4 in Athens</p>	
<p>In the context of minimizing the energy consumption for the new Metro Line 4 in Athens, currently in the tender phase and with the project construction aimed to start in 2019, new measures, new system architectures, new operational methodologies and new equipment characteristics were adopted in the design and project specifications, in an effort to ensure minimized overall energy consumption for the trains and systems operation and providing a sustainable operation with minimized CO₂ production.</p> <p>The measures covered a wide range of systems in stations, tunnels and trains. Regarding the trains, these measures include a new scheme for sending regenerated energy from train braking back to the city medium voltage 20 kV grid and new upgraded functions for the driverless trains operation maximizing the trains braking energy re-use by other accelerating trains, implying a central computerized optimization of the complete train fleet in operation. For stations, the new measures include new lighting concepts with LED lighting fixtures and efficient lighting control philosophies including discrete lighting circuits control, dimming, use of lighting sensors etc.; new advanced control systems for electromechanical installations operating continuously such as escalators / travellers, optimizing their high energy consumption as based on need ; new interfacing philosophies between systems to further increase the overall operational efficiency such as managing the deployment of the suitable number of operational trains at any time of the day in the line as based on the incoming passengers at stations as counted in detail by the entrance gates. Regarding tunnel ventilation and temperature control in the tunnels, the operation shall maximize the use of natural ventilation through the trains' piston effect, and minimize the use of the high volume flow rate and high powered axial fans as based on tunnel temperature sensors.</p> <p>For the complete project, all motors used in equipment such as in fans, HVAC units, pumps, lifts, escalators, Platforms Screen Doors (PSDs), fare collection gates, etc., shall be of high energy efficiency according to the latest EU standards. Furthermore, the maintenance activities of all trains and systems shall be organized on principles of condition based maintenance to the degree possible as allowed by the information from the trains and systems sensors and this will overall reduce the maintenance activities and thus save energy. Finally, the selection of materials for the construction of the stations shall be based on environmentally friendly materials and materials with the minimum possible CO₂ footprint in their production and transportation.</p>		

CV:

BSc, MSc in Mechanical Engineering, PhD in experimental/computational fluid dynamics - heat transfer (Imperial College London, 1987). Continued with CFD in turbomachinery/aircraft/wind turbine aerodynamics for 5 years, participating in EU funded research projects. Worked (in a Ministry) in large scale public transportation projects planning, then moved to Attiko Metro, working for 23 years, initially as a metro ventilation-A/C, fire protection and electromechanical systems engineer, then in design, interface coordination and project management of metro/tram systems implementation as Deputy Engineering Manager.

Worked for 14 Metro & 3 Tramway projects in operation / construction / design, on :

- Managing electromechanical/railway systems design reviews from on-going construction contracts submitted by contractors and design consultants on all design levels.
- Managing, coordinating and contributing to electromechanical/railway systems in-house or consultant assisted designs of new metro lines and extensions covering stations, tunnels, shafts and depots, underground car parks and bus transfer facilities as well as systems upgrading in existing metro lines. Emphasis on civil works layouts, interface coordination between structural/architectural/electromechanical/railway system requirements.
- Ensuring passive/active Fire and Life Safety design for stations/shafts,/tunnels/depots (smoke dispersion control, evacuation safety, fire compartmentation, fire detection, fire suppression, dry/wet systems, sprinklers, automatic fire extinguishing, fire curtains, emergency/safety/directional lighting, emergency routes/exits, pressurized staircases, structural fire safety, interfaces with other systems, rolling stock & fare collection gates).
- Organizing and preparing Design - Performance - Material & Workmanship specifications for new projects for all electromechanical and railway systems.
- Managing and preparing rolling stock specifications and procurement strategies for metro/tram vehicles
- Organizing "General Specifications" for new metro/tram projects covering procedures, design contents, coordination requirements, RAMS, EMC, project documentation, etc.
- Identifying new systems technologies and preparing tender documents for their implementation, ensuring compatibility with existing operational systems.
- Providing necessary input for Environmental Impact Assessment studies
- Providing BOQs & costing estimates for electromechanical/railway systems and rolling stock. Created and continuously supplementing costing databases.
- Assisting projects costing/scheduling, at concept/preliminary/detailed levels
- Coordinating with Contracts, Costing, Scheduling and Legal departments, in preparing contract documents for metro/tram projects construction contracts.
- Cooperating with operational safety auditors on operational safety assessments
- Defending the company's positions against external auditors
- Worked on the ISO certification procedures for the Engineering department
- Supporting Research/Technology proposals to secure EU's research project funding.
- Testing/commissioning procedures preparation
- Systems installations supervision
- Managing contractual disputes
- 32 publications in international journals/conferences. Limited teaching experience.