Keynote

"ELECTRICAL PROPULSION SYSTEMS: A PERMANENT INNOVATION CHALLENGE FOR ALSTOM"

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Abstract

The trend for system traction drives is dictated by the requirements of better operational conditions for trains and global comfort for passengers. This analysis is strongly depending on the market segment but they are some common trends:

- In general, price of new traction drive must be more and more competitive.
- Reliability of new technologies must improve the reliability of previous generation
- Maintenance must be ease and manage (e maintenance)
- There is a global request to optimize energy efficiency
- Life cycle cost is now a key parameter to be considered

Segment by segment, there are some specificities that can be summarized in the following table:

Segment & Product	Key Drivers	Some tentative trends
For all segments	1) Acquisition cost equal or lower 2) Better reliability (Increased MTBF) 3) Easier maintenance 4) Better energy efficiency 5) Lower Life Cycle Cost	1) New Active Components Introduction = SiC 2) Breaktrough in Passive Components 3) e-diagnostic
TRAMWAY	Mass/volume reduction	Synergy with automotive & industrial (600V regulated bus) Energy management with ESC (Braking Rheostat suppression)
METRO	Volume reduction Electric braking improvement	Synergy with automotive & industrial (600V regulated bus) Full integration on boggie (inverter -motor)
REGIONAL	Weight reduction	New architectures including motor Passive cooling system
TGV/AGV	Weight reduction Power increase	e-transfo Higher bus voltage Higher isolation of motors
LOCO	Power increase	Higher bus voltage Higher isolation of motors
Auxiliaries	Global Integration in the car Noise reduction	New electrical and physical architecture Extended passive cooling

In PRIMES (Platform for Research in power Integration, Management of Energy and Storage), power technologies are developed and tested to meet the requirements described in the above table.
The presentation will detail two technologies that have a very high application potential: wide band gap semiconductors and passive cooling.

Biography of the Speaker

Ing. Alain Jullien is currently director for Development and Industrial Relationship – Innovation & Research Group. Electronic engineer, with more than 39 years spend in railways business, he began is career in research with the challenge to design first chopper in 1970. After different jobs like Quality manager, Sourcing director, Head of technology, International sales he has been responsible to implement research strategy on the site of Tarbes from the last ten years. In 2001, he has been in charge to organize PEARL cooperative lab, and is President of the innovative platform PRIMES. He is well known in France for its feeling on Mechatronics strategy. Also coordinator of all electronic federating program within aerospace Valley.