



PRESS RELEASE Nr. 30 /2013

Results of the RIVAS Project: Final Conference “Vibrations – Ways out of the annoyance” opens in Brussels

(Brussels, 21 November 2013) The RIVAS consortium, under the coordination of UIC, is holding its Final Conference today in Brussels bringing together around 100 rolling stock experts, track maintenance specialists, suppliers, railway operators, rolling stock experts, and academics.

RIVAS is a joint research and development project carried out by 27 partners from nine European countries within the 7th European Framework Programme. Since the RIVAS project started in early 2011, it has been seeking to find ways and methodologies to reduce the ground borne vibrations induced by rail traffic. The final conference is therefore the opportunity to know more about the results achieved by the project and on possible ways to address the issue of vibration mitigation.

The topics covered will include:

- Innovative strategies to reduce vibration from rail traffic;
- Technical solutions for vibration reduction at source;
- Vibration reduction on the transmission path;
- Design of vibration mitigation measures for hot-spots;
- State-of-the-art computer simulations;
- Harmonisation of requirements and assessment procedures;
- Priority routes;
- Recommendations for end-users.

RIVAS aims at reducing the environmental impact of ground-borne vibration from rail traffic while safeguarding the commercial competitiveness of the railway sector. The project's goal is therefore to provide tools to solve vibration problems for surface lines by 2013.

It therefore aims to contribute to the development of relevant and leading technologies for efficient control of people's exposure to vibration and vibration-induced noise caused by rail traffic. RIVAS focuses on low frequency vibration from open lines which is a concern mainly for freight traffic. However, RIVAS results will also be applicable to suburban, regional and high-speed operations. RIVAS includes fundamental research, prototype construction, optimisation of pre-existing solutions and field testing under realistic conditions.

The RIVAS project is strongly end-user driven in order to ensure maximum exploitation of results in practice and to prepare an extensive and fast implementation of technical developments.

The key deliverables of the RIVAS project are: assessment of the benefits of mitigation measures in terms of human response and agreed protocol for the evaluation of annoyance and exposure to vibration; agreed measurement protocols to assess and monitor the

performance of measures to reduce vibrations; agreed protocol to characterise vibration response properties of soils; guidelines for track and vehicle maintenance geared towards low vibration; mitigation measures for ballasted and slab track; guidelines for the design of transmission mitigation measures under/next to the track; guidelines for the design of low vibration vehicles.

Mr Philippe Citroën, Director-General of UNIFE gave an opening speech emphasising the “clear need for innovative vibration reduction technologies in the European context. This would help ensure that in the coming years the aspiration of expanding rail transport in the EU is not hindered by public opposition on the grounds of vibration. This need was reflected in the 7th Framework Programme and will be still present in the coming Horizon2020 Calls. Among other activities, UNIFE produced together with UIC the official Newsletter distributed today. I am convinced that the railway industry (including the 5 UNIFE members part of RIVAS) will benefit from the results of RIVAS, in particular thanks to the new technologies to reduce vibration ‘at source’ in rail vehicle and track design which will be presented later on today... I am convinced that noise and vibration will be two crucial issues to be included in the agenda of the Shift-2-Rail initiative, an unprecedented commitment to massively enhance the capacity of the European rail system”.

Mr Kersten, Director of UIC Rail System Department gave an introduction to the conference reminding participants that “the 2011 EU Transport White Paper foresees the global freight transport activity to increase, as compared to 2005, by around 40% by 2030 and by little over 80% by 2050. Taking into account this general transport trend, the ERRAC forecast for 2050 fully matches the 2011 Transport White Paper objectives as shown in the table: the rail share of both the freight and passenger markets will double by 2050, at the same time the rail freight and passenger market volumes will more than triple by 2050 as compared to the year 2000.

However, the growth perspectives mentioned above will only become reality if the railways will be able to defend their number one position in terms of sustainability. Noise and vibration are definitely to be perceived as a challenge in rail’s environmental credentials. As other transport modes, in particular road transport, are currently catching up in terms of sustainability, it is essential for the future of the rail transport mode that this challenge is met effectively, but in view of the intermodal competitiveness also in a most efficient manner.

In former scientific projects and also in previous UIC-activities, a big effort was made to reduce noise from rail traffic. These activities have led to new noise reduction technologies, which are currently being implemented by the railways. Although noise has received this increased attention in terms of research and implementation of mitigation technology, the related issue of ground vibration has not, because noise was more important in the perception. Nevertheless public sensitivity to vibration issues has also increased in recent years. The number of complaints from residents about high levels of vibration is rising particularly at those locations, where efficient noise reduction technologies like noise barriers have been installed. Most of the complaints against high levels of vibration addressed to mainline railways concern freight traffic on surface lines.

Noise and vibration mitigation have been identified as a top priority for UIC members in the dedicated UIC strategy programmes, such as the UIC Environmental and Sustainability strategy.

UIC has accepted the role of coordinator in the RIVAS project since we consider RIVAS as a key element in the railway sector's effort to reduce the environmental impact of ground-borne vibrations while safeguarding the commercial competitiveness of the railway sector.

However, as you will see in the presentations of that final conference, the solutions were not simple to find because the problem of vibrations has multiple causes and therefore solutions had to take a wide range of parameters into account. Nevertheless we have managed to come up with innovative solutions and approaches for vibration mitigation technologies to help our end-users mitigate rail-induced ground-borne vibrations.

It is important to note that RIVAS is only aimed at dealing with vibration abatement measures in terms of their technical effectiveness. The extent to which they are also cost-efficient can only be determined after a market has developed for such measures, allowing costs to be assessed. Then it might turn out that a Measure A which might be technically slightly inferior to a Measure B should nevertheless be preferred to B, if A's costs are significantly lower than those of B. Even without a detailed cost assessment, however, it can be assumed that some measures will only be economically feasible with newly constructed lines.”

Mr Wolfgang Behr, UIC technical coordinator, explained the problems that the project is willing to solve. First of all the question is complex due to the different trains, different tracks, different soils and different buildings. “The sensitivity of citizens to vibration issues has increased in recent years and opposition to new lines is as much about the effects of vibration as about noise. Besides, vibration mitigation features heavily in the cost of railway infrastructure projects and complaints about vibrations and vibration-induced noise increase where noise barriers have been built. So there is a lack of established solutions for vibration from surface railways.

That is why the aim is to ensure that in the coming years, the expansion of rail transport in the EU is not hindered by public opposition due to vibrations so the rail sector has to find solutions from the vehicles, the tracks and the ground working on innovative solutions for hot-spots, low vibration rolling stock and clear assessment procedures and descriptors.”

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