

## INTERFACE EXPERT GROUP

### 1. Characteristics and Objectives of the Expert Group, Professional Focus

Professional goals:

- Competitiveness and expertness increasing of the cooperating subjects (internal within TP and the external ones) in the sector of railway vehicles; especially on its interface with other subsystems of the railway sector (structural and functional)

Working priorities:

- intensify pursuit of the long-term cooperation of the public and private sector in the interfaces of railway vehicles and the next subsystems
- intensify the interdisciplinarity of research, development and international cooperation
- accent on the human resources development

Characteristics of EG:

- project-directed expert working team which covers the wide problems range of the railway vehicles and their interfaces with its specialization
- sharing of related expert and organizational skills between the members of the group and in terms of the whole TP as well as within public

### 2. Contents of Expert Group Activities

Work Topics:

#### **Railway vehicle – sound emissions and vibrations**

- sound emissions in the railway system, effectivity of the sound protection measures, practical carrying out and evaluation of the related tests, sound parameters research for the wheel-rail contact, development of new measuring and testing facilities

#### **Railway vehicle – track**

- force effects at the wheel-rail contact, research in the area of measuring technology, new tests and evaluation procedures, research of the safety-relevant parameters of the vehicles during their position on the twisted track, centripetal acceleration effect due to the cant

#### **Railway vehicle – interior**

- applied research of the interior elements effects to the passive safety of the passengers, simulation of persons movement in the vehicle interior during the vehicle impact and the possible injuries, international legislation, fire safety requirements to the interior elements

#### **Railway vehicle – aerodynamics**

- calculation and measurement of the relevant force effects, related international legislation, influence of surrounding conditions to the measurement results

#### **Railway vehicle – dimensions**

- design dimensions requirements to the railway vehicles from the point of view of limiting (reference) dimensions, international legislation, linkage to the relevant technical vehicle features

#### **Railway vehicle – common service safety**

- application of the CSM problems, the requests of the up-to-date EU legislation (4.RP)

#### **Work outputs:**

- research reports, measuring reports, expert evidences, assessments, articles, lectures, statements, functional and industrial designs, benefits for the working team activity, consultations, cooperation, pedagogical activity. Outputs are aimed for business partners, cooperative subjects, project's consortiums, national and international working groups, official institutions, academic sector

#### **EG's contribution to the interoperability:**

- submissions to the discussion about the international legislation actualization, participation on the work of many international working groups with the referred direction, the work on the questions connected with the praxis of 4.RP

### 3. Composition of the Expert Group

	<i>Name</i>	<i>Company/Institution</i>	<i>Expertise</i>
<i>Manager</i>	Ing. Zdeněk Malkovský, Ph.D.	VÚKV	RST, legislation
<i>Deputy of the Manager</i>	Ing. Jiří Jelének	VÚKV	RST, CSM, legislation
<i>Members</i>	Ing. Jaroslav Grim, Ph.D.	TP IŽI	RST, INF, ENE, CCS, legislation
	Ing. Jiří Hanuš	ACRI	RST, CCS, legislation
	doc. Ing. Josef Kolář, CSc.	ČVUT	RST, pedagogical activity
	Ing. Lukáš Hejzlar	VUZ	RST, testing
	Ing. Petr Kaván, Ph.D.	EUROSIGNAL	RST, CCS, testing

	Ing. Martin Kohout, Ph.D.	UPa DFJP	RST, testing, pedagogical activity
<i>Other Associates</i>	Ing. Michal Satori, Ph.D.	EŽ	RST, ENE
	Ing. Jaroslav Vašátko	TP IŽI	RST, legislation

#### 4. Specific Expert Group Collaboration with the other Members of TP IZI

<i>Member of TP IŽI</i>	<i>Content and Focus of Collaboration</i>
Elektrizace železnic Praha, a.s.	interface current collector-contact line
VUZ, a.s.	RST (noise emission, vibration, running quality of the vehicles)
ČVUT Fakulta stavební	interior and its fire quality
ČVUT Fakulta strojní	RST (running quality of the vehicles), pedagogical activity
ČVUT Fakulta dopravní	RST, rail vehicles (ergonomic, passive safety), CSM
UPa DFJP	RST (noise emission, vibration)
ZČU	Interior quality (characteristics), passive safety
EUROSIGNAL, a.s.	general safety of the railway vehicle's operation according to CSM RA
Skanska a.s.	evaluation / assessment of OTM
enteria a.s. .	evaluation / assessment of OTM
Subterra a.s.	evaluation / assessment of OTM
SŽ	RST (tests, projects cooperation)
Vyšší odborná škola a Střední průmyslová škola strojní, stavební a dopravní, Děčín, p.o.	participation in school activity (lectures, according to the agreement)

#### 5. Overview of Implemented Projects (*in the period from 2018 to the end of 2020*)

<i>Project Title/ Acronym</i>	<b>Advanced stationary test processes of railway vehicles / TWIST</b>
<i>Project No</i>	TH 0101529
<i>Funded by</i>	TA ČR
<i>Implementation Period</i>	2015 - 2018
<i>Total Budget</i>	17,42 mil. Kč
<i>Beneficiary/ Coordinator</i>	VÚKV
<i>Consortium</i>	VÚKV
<i>Project Goal/ Project Benefits</i>	applied research in the area of safety relevant parameters of railway vehicles

<i>Project Title/ Acronym</i>	<b>Competence centre of railway vehicles / CKDV</b>
<i>Project No</i>	TE 01020038
<i>Funded by</i>	TA ČR

<i>Implementation Period</i>	2012 - 2019
<i>Total Budget</i>	340,23 mil. Kč
<i>Beneficiary/ Coordinator</i>	ZČU
<i>Consortium</i>	ZČU, UPa, ČVUT, VZLÚ a.s., Eurosignal a.s., CZ LOKO a.s., DAKO-CZ a.s., LEGIOS a.s., MSV elektronika s.r.o., ŠKODA ELECTRIC a.s., Škoda Transportation a.s., VÚKV a.s., Wikov MGI a.s. (in the time of project approval)
<i>Project Goal/ Project Benefits</i>	increasing of competitiveness of the Czech Republic in the railway vehicle branch, strengthening cooperation in the branch, strengthening of the research staff mobility, research and development strengthening in the railway vehicle branch

<i>Project Title/ Acronym</i>	<b>Running quality evaluation of the vehicles in the limited ride (directional) conditions, connection with the increase of the load on track, derailment risk caused with high longitudinal compressive forces in the train units</b>
<i>Project No</i>	-
<i>Funded by</i>	SŽDC
<i>Implementation Period</i>	2017-2018
<i>Total Budget</i>	3 mil. Kč
<i>Beneficiary/ Coordinator</i>	-
<i>Consortium</i>	SŽDC, DFJP UPa, VÚKV
<i>Project Goal/ Project Benefits</i>	obtaining the groundwork for the rules for the pushed train operation

<i>Project Title/ Acronym</i>	<b>Numerical simulation of the noise emissions from the bogie when the vehicle's passing</b>
<i>Project No</i>	TH02010775
<i>Funded by</i>	TA ČR
<i>Implementation Period</i>	2017 - 2018
<i>Total Budget</i>	13,2 mil. Kč
<i>Beneficiary/ Coordinator</i>	MECAS ECI
<i>Consortium</i>	VÚKV, MECAS ESI
<i>Project Goal/ Project Benefits</i>	obtaining the groundwork for the methodology for the track and railway wheel model for the vehicle's passing simulation

<i>Project Title/ Acronym</i>	<b>National Competence centre of Josef Božek / JOBNAC</b>
<i>Project No</i>	TN01000026
<i>Funded by</i>	TAČR
<i>Implementation Period</i>	2019 – 2022
<i>Total Budget</i>	
<i>Beneficiary/ Coordinator</i>	ČVUT
<i>Consortium</i>	ČVUT, VÚKV, TUL, Siemens Mobility, ŠT, TUL, UPa, ...

<i>Project Goal/ Project Benefits</i>	Research and development of the future means of the sustainable mobility
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<i>Project Title/ Acronym</i>	<b>Safe tram front</b>
<i>Project No</i>	FV20441
<i>Funded by</i>	MPO
<i>Implementation Period</i>	2017-2020
<i>Total Budget</i>	25,5 mil.Kč.
<i>Beneficiary/ Coordinator</i>	ŠT
<i>Consortium</i>	VÚKV, ŠT, ZČU
<i>Project Goal/ Project Benefits</i>	Pedestrian-Tram collision analysis, real accident analysis, static and crash test of windshield

<i>Project Title/ Acronym</i>	<b>Accident analysis: pedestrian-Tram, validation of the simulation models</b>
<i>Project No</i>	CZ.02.1.01/0.0/0.0/16_026/0008401
<i>Funded by</i>	MŠMT
<i>Implementation Period</i>	2018-2022
<i>Total Budget</i>	43 mil.Kč.
<i>Beneficiary/ Coordinator</i>	Univerzita Karlova, Praha
<i>Consortium</i>	UK, VÚKV, ŠT, Advanced Engineering
<i>Project Goal/ Project Benefits</i>	Real collision analysis of Tram and DUMMY, simulation models and its validation, optimized 3D (CDA) model proposal, Tram front MKP design

<i>Project Title/ Acronym</i>	<b>Design and optimization of welded constructions of structure and bogies parts of railway vehicles</b>
<i>Project No</i>	TH03020044
<i>Funded by</i>	TA ČR
<i>Implementation Period</i>	2018-2021
<i>Total Budget</i>	32 mil. Kč.
<i>Beneficiary/ Coordinator</i>	ŠT
<i>Consortium</i>	ŠT, ŠV, VÚKV, MECAS ESI
<i>Project Goal/ Project Benefits</i>	Calculation and design of aluminium and steel welded constructions

6. Overview of Implemented Expert Group Activities (in the period *from 2019 to the end of 2020*)

<p>(Expert Group members participate repeatedly on the following activities)</p> <ul style="list-style-type: none"> <li>• Technical Meeting UNIFE</li> <li>• Technical Assembly UNIFE</li> <li>• Cooperation - plenary meetings ERA</li> <li>• work and meetings ACRI</li> </ul>
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- national and international trade fairs / professional meetings / conferences
- work for professional groups CEN/CENELEC/ISO (01, 2, 10, 32, 269, 256 ... all in connection with the interface of RST subsystems)
- pedagogical activity (ČVUT, DFJP UPa)
- work on projects, see point no. 5
- cooperation on related activities TP IŽI

## 7. Representation of the Expert Group in National and European Institutions

<b>National or European Institution</b>	<b>Name</b>	<b>Place of work</b>
ACRI	Ing. Zdeněk Malkovský, Ph.D	VÚKV
UNIFE	Ing. Zdeněk Malkovský, Ph.D	VÚKV
CEN/CENELEC	Ing. Zdeněk Malkovský, Ph.D	VÚKV
ISO/CEN/CENELEC	Ing. Radek Westfál	VÚKV
CEN/CENELEC	Ing. Jan Čapek, Ph.D	VÚKV
CEN/CENELEC	Ing. Tomáš Heptner	VÚKV
CEN/CENELEC	Ing. Jiří Jelének	VÚKV
ERA	Ing. Jiří Jelének	VÚKV
CEN/CENELEC	Ing. Emanuel Mergl	VÚKV
ČAS / TNK 141	Ing. Jan Lutrýn Ing. Tomáš Heptner	ACRI / VÚKV VÚKV