

The logo for EURNEX, featuring the word "EURNEX" in a bold, blue, sans-serif font. The letters are slightly shadowed and have a horizontal line passing through them, giving it a dynamic, forward-moving appearance.

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EURNEX

EUropean **R**ail research
Network of **EX**cellence

SIXTH FRAMEWORK PROGRAMME

PRIORITY 1.6.2: SUSTAINABLE SURFACE TRANSPORT

Pole Action Plan

Pole 4: Product Qualification Methods

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Introduction

Based on the workshop discussions during the 2nd EURNEX Integration Conference each pole of excellence has to prepare an **action plan** to develop and to consolidate the pole within the next critical months. The Action Plan is therefore the “short-term precision” of the mid-term/long-term pole strategy. In order to ensure consistency within EURNEX a template for the action plan had been prepared (see following pages). It is divided into sections with boxes indicating the expected content for the section concerned.

As emphasised on the Integration Conference again, the European Commission expects from EURNEX the more efficient use of the rail research resources. In essence, for our preliminary poles this means:

- Concentration and specialisation
- Integration of research
- Interdependency among pole members

The action plan therefore has to reflect the steps on how to achieve this. Moreover, the contribution of each pole to the durable, long lasting EURNEX business case must be addressed, in particular by the project acquisition planning.

With the aim to cover the relevant items for short-term pole development, the action plan template covers the following sections:

- ❖ Objectives of pole
- ❖ Capabilities involved
- ❖ Collaboration opportunities identified
- ❖ Capability gaps still existing
- ❖ Projects towards Business Case
- ❖ Other actions supporting the establishment of the pole
- ❖ Pole development and milestone planning

It is apparently not necessary to prepare a comprehensive report. The focus should be on understandable and verifiable statements providing the ideas on how to move forward with pole development. Even if not every detail can be described or anticipated today the first issue of the action plan should be prepared as soon as possible, because its submission is the condition to achieve support from the EURNEX WP's.

Due to its importance to achieve support for pole development, the draft of the action plan should be prepared as soon as possible, but not later than **31 March 2005**.

The action plan shall be a “living document” to be periodically updated.

Pole Action Plan

Pole No.4: Product Qualification Methods

1 Objectives of the pole

Improve the effectiveness of testing and modelling and develop of product qualification methods for new techniques and technologies supporting the implementation of TSI's through enlarged Europe.

1.1 Thematic areas

- a) research and development to improve
- methods of assessment
 - test procedures
 - test facilities (equipment)
 - modelling
 - knowledge management system on PQM

- b) independency and efficiency in
- assessment of conformity of standards
 - crossacceptance procedures

- c) education and training for product qualification and TSI implementation through enlarged Europe

1.2 Required capabilities

To be able to bring the added value in introduced areas the following competences are necessary within the pole:

- product design and specification
- materials and technology
- laboratory testing procedures
- design and management of facilities
- modelling procedures
- quality control system
- communications and software reliability and product qualifications

The relationship between the competencies and the pole section is presented in the following matrix:

	Rolling Stock	Infrastructure	Control command and Signalling	Telematics and Informatics	Energy	Safety and Security	
Product design	+	+	+				
Materials and Technology	+	+			+		
Laboratory testing procedures	+	+	+	+			
Design + Management of facilities			+	+		+	
Modeling procedures	+	+	+	+	+	+	
Quality control	+	+	+				
Communication + software reliability			+	+		+	

2 Capabilities involved in the pole

2.1 Institutions and contact persons

Member	Institution		Country	Contact person
3	INRETS	Institut National de Recherche sur les Transports et leur Sécurité	France	Charles Tatkeu
17	DLR	Deutsches Zentrum für Luft- und Raumfahrt	Germany	Klaus Jaschke
20	RTA	Rail Tec Arsenal Fahrzeugversuchs-anlage GmbH Wien	Austria	Gabriell Haller
23	CVUT	Czech Technical Universtity	Czech Rep.	Petr Moos
24	CD-VUZ	Czech Railways - Railway Research Institute	Czech Rep.	Libor Lochman
26	CNTK	Centrum Naukowo-Techniczne Koljenictwa Warszaw	Poland	Witold Olpinski
28	UNIZA	University of Zilina, CETRA – Center for Transportation Research	Slovak Rep.	Mr. Kalincak
29	SUT	Silesian University of Technology Katowice	Poland	Marek Sitarz
30	UPCE	University of Pardubice, Jan Perner Transport Faculty	Czech Rep.	Karel Sotek
34	MMU	Manchester Metropolitan University	UK	Simon Iwnicki
49	IDMEC	Instituto de Engenharia Mecanica	Portugal	P.Tavares de Castro
54	TIFSA	Tecnologia e Investigation Ferroviaria	Spain	J.G.Velarde

This list is only provisional, the membership is in progress.

2.2 Competences of Pole members

Based on the informations introduced by the pole members in the catalogue sheets, the Pole disposes in it's six sections of following competences:

Rolling Stock

- design, exploitation and repair of rail vehicle and certification
- development and testing of new concepts for guidance systems of railway vehicles with/without control and mechatronics, respectively, e.g. the mechatronic wheelset

Testing:

- design, assembly and calibration of instrumented wheels/wheelsets

- design and assembly of measurement chains for other on-board and wayside measurements
- planning and execution of tests
- interpretation of test results
- vibration measurements
- noise measurements
- measurement electronics design and assembly

Simulation:

- multi-body simulation of railway vehicles
 - Finite Element Analysis
 - track and switch vibrations
 - comparison of theoretical and experimental results
 - expert assessment in certification against nacional, european (ex. TSI) and international normative
- propulsion system
 - body shell
 - air conditionig systems
 - brakes
 - carriage/wheel interaction
 - vehicle/track interaction
 - energy systems
 - pantograph
 - bord energy supply system
 - vehicle superstructure
 - door systems
 - coupling systems
 - control systems
 - noise and vibration
- Review of existing test procedures
- Recommendtions for new test procedures

Infrastructure

- design, and construction infrastructure and certification
- asynchronous simulation of railway operation in complex stations and nodes
- simulation of railway traffic on lines (equipped by variuos signalling systems) and station (equipped by various interlocking systems)
- simulation of line/station signalling systems operation
- comparison of theoretical and experimental results
- permanent way (rails, sleepers, switches, ballast)
- control and diagnostics systems

Energy, power supply, power consumption

- AC/DC traction technology for electric locomotives
- AC traction technologies for diesel locomotives
- 50 Hz high voltage electrification network, system monitoring and control
- alternative energy systems, environmental influences optimization
- testing of electromagnetic emission solutions - EMC
- simulations and modelling
- effectiveness of energy consumption
- electric and traction power supply system.
- overhead contact system.
- power supply system of non-traction receiver.

Control-Command and Signalling

- control and diagnostic systems
- signalling (ERTMS, ETCS, ETML, EOR)
- processes oriented IS decision support
- interlocking plants
- GSM-R
- GALILEO

Information Systems and Telematics

- transport and logistic control systems, automation transport processes, problems
 - of modelling in control theory and engineering, digital electronics and telematics, transport and logistic control elements and systems.
- researching of traffic control devices and verification of safety proves and control systems.

Safety and Security as "cross-sectional"

- railway safety inspection against the relevant european normatives:
 - safety independent assessment for the Safety Case
 - follow up of the life-cycle in safety of a product, installation, subsystem, etc.
- certification and conformity assessment of products for railway application as well as calibration of measuring tools and measurements of assemblies, subassemblies and parts of rolling stock and infrastructure during their service

3 Collaboration opportunities

Strong collaboration will be established with the other Poles, mainly with Pole 3 – Rolling Stock, where tests and models - also as new product qualifications – have to be improved and for new types of products (mainly in control and signalling) have to be introduced. In cooperation with the Pole 2 – Operation and Interoperability – the methods and methodologies on the basis of TSI's will be transformed in to the practice mainly in new EU countries.

The results will help to common understanding to TSI standards for railway components and their relationship. As a common issue there is a range of tools or models to quantify relationships, system validation and testing.

Deep coordination has to be established between Notified body, Standardization bodies, European Railway Agency and the Pole. For that reason, the structured knowledge base in cooperation with UIC, UNIFE, ERRAC, ERA must be designed on the common platform with the mutual agreed knowledge ontology.

The cooperation with the Pole 5 – Intelligent mobility – will help in assessment of IT products.

4 Projects towards Business Case

4.1 Definition of new projects

(Will be discussed and completed during the meeting in Vienna – 25th April 2005)

- as a priority in a short term ist to define a limeted set of pilot projects to start within the next four month
- current projects will be included into the concept of the Pole and coordinated with Pole teams
- the reviewed list of relevant projects will be specified during the workshop in Vienna

4.2 Support to the railway industry

- new offer in establishing of “virtual teams” cooperating with the “scientific network”. Formulation of projects, protocols and processes for virtual teams
- new methods for modeling, simulations and TSI implementation

4.3 Collaboration with other poles

Starting the work the Pole will organize a seminar for representatives of other Poles to offer them possible issues for cooperation. In some specific projects the pole members will offer service with the testing and modeling capabilities.

In an introductory workshop the basic principles and formats of cooperation in “virtual teams” will be introduces simultaneously with the “basic onthology” of common “EURNEX Knowledge Management System”.

5 Other actions supporting the establishment of the pole

5.1 Internal knowledge sharing and mobility

- edition and print of "Catalogue of Services in Product Qualification Activities"
- common knowledge management system within the Pole and whole EURNEX network based on the new established knowledge ontology
- scientific "Virtual Team Configuration" for pole members
- regular pole workshops (3-4 per year) to bring together researchers with different research areas
- to prepare proposals for new projects and business cases in a common workshop of the pole

5.2 External communication and promotion

- participation in Pole workshops will be offered to the representatives of the industry (namely to UNIFE) as well to certain producers directly
- invitations for industry experts in certain project (f.e. SIEMENS – in the pilot project of testing GSM-R applications in the Laboratory of social communications at CVUT Prague)
- pole web pages for single pole sections and offered services within the EURNEX portal (capabilities, facilities, projects, services)

5.3 Service to the industry

- summary of offered services for industry – printed and e-form of the catalogue of services
- scientific and laboratory support to industry
- market analysis and concentration on market challenges
- complexity of tests, validations, assessment with scientific support and knowledge management system

6 Pole development and Milestone planning

6.1 Short term schedule (April – July 2005)

- | | |
|-------------------------------------|----------|
| - establishing the pole structure | 30/04/05 |
| - completing the Action plan | 15/04/05 |
| - finalization the pole member list | 30/04/05 |
| - summary list of initial projects | 30/04/05 |
| - proposals for pilot projects | 30/06/05 |
| - web pages Pole 4 | 30/06/05 |
| - workshop on pole integration | 03/07/05 |

6.2 Mid term actions and milestones

- | | |
|--|----------|
| - International Conference under the participation of industry | 10/05/05 |
| - printed catalogue of services | 08/05/05 |
| - launch pilot projects | 10/05/05 |
| - new projects proposal | 31/05/05 |
| - establishing the Pole Committee | 31/05/05 |