
UIC Project PROSPER - Network Meeting Paris

„Procedures for Rolling Stock Procurement with Environmental Requirements“

Project Results

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Content

State of the art

Integration of environmental aspects into the procurement process

Environmental specifications in invitations to tender

Evaluation of tenders under env. aspects

Cost/ Benefit analysis



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There is a large variety of different environmental specifications in invitations to tender.



How are environmental aspects regarded in invitations to tender?

- **In each of the analysed invitations to tender environmental aspects were stated, but in many cases**
 - a large variety of different specifications
 - the intensity of concerning environmental aspects differs from railway to railway
 - energy is often not regarded under the consumption aspect
 - some specifications are not measurable

⇒ need for harmonisation and common approach



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Environmental requirements should be considered as a standard requirement in the procurement process.



How can environmental aspects be integrated into the procurement process?

- **To handle environmental aspects in a structured way the following issues should be regarded:**
 - **Establishing a guideline that reflects the environmental strategy of the company**
 - **Environmental requirements as a standard aspect**
 - **when elaborating invitations to tender**
 - **in evaluation of tenders**
 - **Fixing environmental performance in the contract**



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Integration of Environmental Aspects into the Procurement Process

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Cost/ Benefit analysis

Especially Noise, Exhaust Emissions, Energy and Materials/ Recycling/ Waste are relevant for railways.



Which are the most relevant environmental aspects for railways? Why are they relevant?

- Noise emissions ⇒ **legislation**, env. performance
- Exhaust emissions ⇒ env. performance
- Energy consumption ⇒ **env. Performance**, cost efficiency
- Materials/ Recycling/
Waste ⇒ env. Performance, legislation
- Electromagnetic Fields
as an upcoming aspect ⇒ env. performance

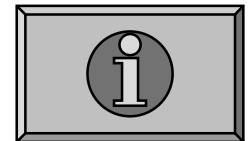


Energy Efficiency is a cost cutting factor in terms of LCC.



Energy Efficiency: Background for specifications

- **Core aspect for environmental performance of railways**
 - Competitive advantage towards other modes of transport
 - International agreements on climate protection (Kyoto Protocol on climate change; national agreements)
- **Cutting Life Cycle Costs**
 - ⇒ in LCC models energy consumption is usually regarded by 10 - 15%
- **Energy consumption standard like in the car industry does not exist for railways**
 - ⇒ energy consumption has to be calculated for the individual case



Energy Efficiency: Specifications

Setting targets or limits for:

- ⇒ **Efficiency of traction equipment**
- ⇒ **Weight per seat**
- ⇒ **calculation of traction energy/ diesel consumption for a specified route**
- ⇒ **calculation of on board energy consumption**

Requiring:

- ⇒ **Energy management system for longer standstills**
- ⇒ **Energy recovery (if possible, e.g. recuperation brake)**

The aspect of noise emissions is already and will be further regulated by European legislation.



Noise Emissions: Background for specifications

- Pressure from residents and legislators to reduce railway noise levels
 - **Directive 1996/48/EU** for high speed trains with Technical Standard for Interoperability (TSI) already in force
 - **Directive 2001/16/EU** on conventional interoperability.
 - development of TSI until April 2004
 - ⇒ Limit values for **passing by noise** (according to applicable legislation)
 - ⇒ Noise measurements according to prEN3095

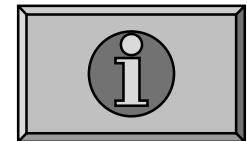


The car industry in the EU reduced diesel emissions due to legislation.



Exhaust Emissions: Background for specifications

- Car and heavy vehicle industry developed effective technologies to reduce exhaust emissions (strict legislation)
 - No limit values on diesel emissions for railways on EU level
 - Recommended limit values by UIC (leaflets 623-2; 624)
 - Particle emissions are often subject of complaints from customers
- ⇒ **Limit values according to UIC-leaflets 623-2, 624;**
for engines < 560 kW according to EURO III - IV (99/96/EU)
- ⇒ Reduction of the necessity of **running engines at standstills**
- ⇒ Possibility to use fuel with **low sulphur content**



The aspect of Materials/ Recycling and Waste is closely linked with maintainability and scrapping costs.



Materials/ Recycling/ Waste: Background for specifications

- Risk management (forbidden and restricted materials)
- End of life costs
- EU Directive on used cars
 - ⇒ No use of materials hazardous to health, safety and environment (**black list**)
 - ⇒ Limited use of restricted materials (**grey list**)
 - ⇒ Defined value for **recyclability** rate
 - ⇒ Use of renewable materials (defined ratio)

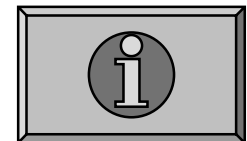


The aspect of Electromagnetic Fields was integrated into PROSPER to serve the precautionary principle.



Electromagnetic Fields: Background for specifications

- **Public discussion on Electromagnetic Fields in several European countries**
- **No evidence of impact on human health**
- **Integration of guideline recommendations to serve the precautionary principle**
 - **Applicable guidelines**
 - **ICNIRP Guideline 1998**
 - **DIN VDE 0848-3-1 for Pacemakers**
 - ⇒ **Recommended limit values by ICNIRP and DIN VDE should be followed**



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REPID will provide the methodology to evaluate the materials/ recycling/ waste aspects.



Evaluation of tenders

- **Noise and Exhaust emissions: indicators and methodology exist**
 - ⇒ verification by measurements
- **Energy Efficiency**
 - ⇒ mass, efficiency traction section, calculation of consumption etc.
 - ⇒ Energy consumption has to be evaluated under LCC aspects
- **Materials: Methodology will be elaborated by REPID**
 - ⇒ Indicators, standardised material lists and IT-Tool will be available soon
- **Electromagnetic Fields: indicators and methodology exist**
 - ⇒ verification by measurements



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Energy is supposed to be a cost cutting factor in terms of LCC.



What is the qualitative impact of environmental specifications on costs?

Analysis of cost/ benefit aspects

- **Elaboration of a questionnaire**

- sent out to railways and manufacturers

- first overview on the results

- ⇒ Energy specifications can be a cost cutting aspect in respect of LCC

- ⇒ Specifications for Noise Emissions will raise investment costs

- ⇒ **final results will be available at the end of the project in June 2003**



Further tasks until project end in June 2003

- ⇒ Finalise investigation on cost/ benefit aspects
- ⇒ Elaborate UIC Environmental Guideline for the Procurement of new Rolling Stock