Welcome to the Europe’s Rail DAC Info Session

February 22nd, 2024
13:00 – 14:00 CET
1. Welcome and Introduction
2. 100 Pre-deployment trains - The bigger picture
3. Objectives and Scope
4. Phasing and Planning
5. Project Structure
6. Next Steps
7. Question and Answers
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The challenges for EU rail freight

**Capacity**

+ 50% rail freight
- 55% GHG emissions by 2030

from bottleneck to green backbone

**Productivity**

from manual intervention to automation

**Quality**

from paper to digital
Processes today – and tomorrow

**manual freight wagon coupling**

Courtesy of ÖBB

**automatic freight wagon coupling**

mechanical, pneumatical, energy & data coupling

Courtesy of DAC4EU consortium
DAC core system & applications (Full Digital Freight Train Operations)

benefits = gains in the processes (time, system time, cost savings, capacity, reliability, quality, safety) + induced modal shift

DAC core system
- Automated coupling & manual uncoupling and digital backbone
- Recording of train composition
- Automatic (in-train and remote) uncoupling
- Heavier & longer trains (within existing infra limitations)
- Increased payload
- Increased speed via improved longitudinal forces

DAC shunting
- Automated parking brake
- Rear view camera for train driver
- Proximity detection
- Sound signals when train in motion

DAC train preparation
- Automatic brake test & calculation of brake capacity
- Automated technical wagon inspection

DAC train run
- Train integrity, enabling ETCS L3 moving block operations
- Increased speed via better braking performance
- Multiple loco traction and trains up to 1500m
- Derailment detection

DAC loading & unloading
- Automatic loading/unloading processes (replacement of hydr/pneum components, electro-mechanical actuators for bridge plates, automated cargo securing, heating elements for defrosting, ...) via ext. energy supply
- Illumination for worker’s safety & interior

red colour = components of the DAC basic package (only those use cases are linked to the pre-deployment trains)
Preconditions for investing in DAC deployment
(= everything that needs to be proven before investment decisions will be taken)

1. DAC-Technology (incl. additional DAC based technology) and DAC-operations/functionalities are clearly defined (tech. package) and harmonised (Single European DAC System)

2. The technology meets all essential requirements - in particular in the area of RAMS (reliability-availability-maintainability-safety/security) - proven through large demonstrations

3. The operational functionalities/use cases bring the expected benefits - proven through large demonstrations incl. safety aspects

4. Positive CBA incl. adequate funding programs (by EU and MS) are made available and guaranteed
   • to all European wagon and locomotive operators (RU) and keepers (as they will have to invest)
   • in order to generate positive business cases in a maximum 10y perspective
   • considering the individual/regional conditions such as the cases where upgrading is not possible/feasible

5. Simple, tailor-made “fast-lane” authorisation procedures are available & authorization risks are mitigated procedures for wagons and locos (incl. availability of relevant documentation)

6. A sound migration plan is set, guaranteeing simultaneous deployment in Europe (sector agreement and legal framework) based on available and adequate funding programs, established capacities for production and upgrading of wagons and locomotives, staff training, and availability of the necessary infrastructure and IT adaptations
All DAC-related activities

Europe’s Rail Flagship Project 5

EDDP
Stakeholder Management

EC/ERA

Europe’s Rail System Pillar

ESOs

DAC migration roadmap

**Europe’s Rail Target operat. proc. functional requ’mts system architecture tech. development testing & demos tech. specification authoris. dossiers**

**DAC/“Full Digital Freight Train Operations”**

**FP 5 FDTO sounding boards**

**Technology (mirroring & sector feedback)**

**Operational Procedures (mirroring & sector feedback)**

**Fleet Analyses & rtf Engineering (rtf readiness)**

**Retrofit capacity plan (workshops, workforce, components)**

**Funding & Financing plan**

**development of efficient & suitable authorisation process & requirements preparing TSI drafts for the EC**

**Investment plan & procurement framework plan**

**TSI revision**

**Operational procedures standardization (plan & execution)**

**Technical harmonisation: preparing inputs for ERA TSI drafting process & driving EU standardisation**

**Alignment of rail & DAC system architecture**

**Executing European standardisation**

**Operating “100” DAC pre-deployment trains**

**Europe’s Rail Stakeholder Management**

**FP5TRAN 4M-R**

**Stakeholder Management**

**Fleet Analyses & rtf Engineering (rtf readiness)**

**Retrofit capacity plan (workshops, workforce, components)**

**Funding & Financing plan**

**CBA (updates)**

**Investment plan & procurement framework plan**

**TSI revision**

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The DAC General Master Plan 01 [June 2023]

Major amendments/NEW:
- DAC pilot deployment projects
- DAC framework conditions development
- Deployment Management Entity

Budget and resource need:
- (already funded)
- (currently mainly unfunded)

Determining milestone:
- DAC Legal Package to be implemented before this deadline

(existing) to be prepared

Sector Statement

Funding Pilot Deployment Projects

Specific access to the network for commercial pilot test operations (based on draft technical specs)

DAC Legal Package:
- TSIs final (technical + migration + operations)
- Deployment Management Entity Deployment Funding Instrument
- Suitable authorisation provisions
Request for expression of interest for 100 pre-deployment trains

EU-Rail Letter sent/published on 17/01; replies requested until 29/02
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Why large-scale testing and a pre-deployment phase is needed

Three objectives:

1. **Ensure full reliability of the DAC technology**
   - Test DAC technology in commercial operations
   - Assess the validity of assumptions developed in EDDP (Migration) / FPS (Design)
   - Assess technology integration by collaboration with FP5 technology providers and suppliers of existing assets

2. **Prove added value and optimise EDDP processes for full DAC roll-out**
   - Gather information for full-scale deployment and roll-out
   - Learn and develop. Create a steppingstone towards full DAC deployment
   - inform and communicate with stakeholders

3. **Ensure smooth integration of DAC into the overall railway system**
   - Ensure (mass) authorisation provisions can effectively be applied
   - Test interchangeability/broad interoperability with other digital systems on trains, tracks and central IT systems
   - Assess operational rules effectiveness
Functions and components considered within the pre-deployment trains

The 100 pre-deployment trains shall be equipped with the **DAC basic package**:  
- DAC coupler incl. energy and data system  
- train composition detection  
- Automated brake test  
- Train integrity/train length determination  
- Automated uncoupling (in-train from loco and with wagon-sided push-button)  

*coupler with mechanical or push-button uncoupling from wagon side and including “prevent coupling” function*

* (Hybrid coupler for locos and DAC for special wagons, e.g. T3000 – if applicable)
For successful piloting in commercial operations, we are looking for ...

- A balance between different involved European regions and Member States
- A mix of different operational conditions (with considerable number of shunting operations, if possible)
- Different Loco and wagon types
- Partners and operators from the whole sector (especially those not yet engaged or involved!):
  
  RUs, wagon & loco keepers, rail freight customers, leasing companies, IMs/shunting yard operators, shunting service providers, maintenance providers, ...

- Enthusiastic frontrunners
• operate as much as possible in commercial operation, maybe supported by special supervision (as potentially not yet fully authorised by the start of operation)

• start operation around in late 2026 for a duration of around 2 years
Your benefits as pioneer for DAC pre-deployment trains

- Operate DAC technology before it is fully rolled out
- Optimise its integration into your operations to gain best efficiencies
- Give feedback for improvement of operational and technical handling, especially for your staff
- **Gain an advantage** in shaping your future freight train operations best to your needs
- Become, together with your customers, innovation frontrunner to early optimise and secure your future business.

- Your feedback will also clarify the budget needed for the pre-deployment phase
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100 Pre-deployment Trains Project - Phasing

**Preparation**
Including finishing the preconditions before start of PHASE II
- Financing and funding conditions
- Stable technical solutions (TRL 6+)
- Authorisation
- Training
- Rolling stock and infra readiness
- ERJU (FP5; SP/Task4) deliverables, including additional calls

**Operation**
With specific focus on...
- Operational scope, geographies, type, ...
- Maintenance, repairs, etc.
- Upgrading and updating
- Monitoring + follow-up / accompanying of operations by FP5
- Procedures / interaction with customers for such special operations

**Evaluation**
Check “intended vs. delivered”. Will be done mainly by FP5 for tech and operational useability and by the “project”/EDDP for the other parts, e.g. retrofit ability.
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For successful testing in commercial operations, we will offer...

- A centralised project structure and programme/project management, following EDDP structure
- Involvement of all participating companies
- Best practice exchange among participants and experts (knowledge sharing, collective problem-solving)
- Expertise support and stakeholder management
- Central alignment with technology providers & on operational rules effectiveness, authorisation, …
- Public Relations Support
- Interaction with ERA, EC, NSA's,…

Note: subject to financing and funding and sufficient participants
• Currently, there is no funding available for the large-scale testing
• Investigations have started on European budgets (e.g. CEF) and national funds
• Interested parties shall nominate, together with the potential train candidates, the required financing and funding

• A substantial list of train candidates is a precondition for an ambitious plan for financing and funding
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100 Pre-deployment Trains Project – Next steps

1. **Reply to the „Expression of interest“ letter sent by EU-RAIL on January 17**
   - info-DAC@rail-research.europa.eu
   - Extended to mid March 15/03/2024

2. **Consolidation of candidates (companies) and train types**
   - Refinement of 100 Trains concept and scope
   - Until mid April

3. **Project initiation charter to be co-developed with participating entities**
   - Until end of May

4. **Project structure to be formalized and staffed; pre-conditions to be fulfilled**
   - Until end of June
To summarise

- We are working on technology, test preparation, migration plans, etc.
- We need, in the next phase, **pilots in commercial operations across Europe** to prove the assumptions and to take the step towards full deployment.

**Therefore we need:**

- Participants, information about trains, operations, vehicles, ...
  
  to further prepare for this phase (funding and financing, testing,...)

**... to achieve the final objectives of**

- Making you more competitive in rail freight business
- Provide better working conditions for (shrinking number of) staff
- Contribute to the Green Deal
Are you interested to join?

• For further questions, information and expression of interest:
  info-DAC@rail-research.europa.eu

• Join the EDDP work packages and sounding boards:
  https://ec.europa.eu/eusurvey/runner/DACIdentificationGridforOperation
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We are also looking for special testing environments

- **Sidings of different sizes** (from single-track to extended siding networks, e. g. chemical, automotive or steel plants)
- Stations using **own wagons for local use**
- **Separable sub-networks**

- Unloading by strong **magnet crane** (effect on electronic equipment)
- **Overhead gravity unloading**
- Very quick **heating of frozen bulk cargo** in winter
- **Permanent exposure to heat** (e. g. waiting close to a furnace)

- **Very heavy trains** close to structural durability, e. g. ore trains
- **Corrosive** environment, e. g. transporting salt
- **Dusty** environment with effect of dust on e. g. pneumatic couplers and e-couplers (e. g. concrete, coke, dust)
- **ATEX** transports

- **Effects of long periods out of service**: Functionality after long time without coupling and energy provision
- (Vandalism)