



# Activity report 2002 to 2005

## **Deufrako** **Franco-German cooperation in** **Land transport research**

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## Introduction

DEUFRAKO is a scientific and technological cooperation in the field of land transport between **Mobilität und Verkehr**, research programme of the German federal Ministry of Economics and Technology (Bundesministerium für Wirtschaft und Technologie)<sup>1</sup> and **Predit**, French programme bringing together the ministries in charge of transport, research, industry and ecology as well as the ADEME, the OSEO Anvar, and since 2005 the ANR.

The Deufrako cooperation can be described in three stages, with a constant widening of the thematic field covered.

It was implemented in 1978 by the Heads of State Valéry Giscard d'Estaing and Helmut Schmidt to cooperate in the field of research on high-speed train (TGV, ICE and Transrapid).

The first thematic widening occurred in 1998 with an opening on telematics, urban transport and freight transport.

In 2002, during the 1st Forum of the Franco-German research cooperation, the two ministries of research agreed that Deufrako should widen its research sphere of action to freight corridors, noise reduction and road safety.

The second Franco-German research Forum in July 2005 pointed out additional issues concerning hybrid vehicles on one hand, the organization of road transport of goods on the other hand.

### **The objectives of Deufrako:**

- To strengthen scientific and technological cooperation in the field of transport research,
- To better coordinate transport research efforts in France and Germany,
- To stimulate research through reciprocal exchanges, cross experiments and common projects,
- To contribute to the making of a European Research Area at a bilateral level.

### **The structure of Deufrako:**

- The steering committee. This committee brings together the financing partners of the Predit and the German programme « Mobilität und Verkehr » ministries and agencies, involved in Deufrako. It meets once year in a restricted group, and a second time in a plenary session, with the chairmen of the existing thematic working groups and an additional panel of experts from both countries.
- This panel of experts from public and private research sectors, assists the steering committee on the research strategy and future priorities, particularly to clearly identify the added value of bilateral projects compared to national and European activities.
- The thematic working groups. They bring together specialists from both countries to discuss project proposals or other activities and their realization. They work on the basis of a mandate, developed with the steering committee, that sets the group's objectives, its duration etc...

Deufrako projects are mainly inter-disciplinary and bring together partners from the industry, research institutes and higher education establishments. Both countries support them jointly, each partner being financed by its own country.

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<sup>1</sup> Until December 2005, Mobilität und Verkehr was financed by the "Bundesministerium für Forschung und Bildung (BMBF)

# I. Deufrako, 1978 - 2002

## 1. Since 1978: rail technology

DEUFRAKO was created in 1978 to reinforce Franco-German cooperation in the field of high-speed rail transport technologies (TGV, ICE, Transrapid).

For 20 years over twenty research projects have allowed to implement a fruitful habit of Franco-German cooperation in the rail field.

### 1.1 A few significant results

- Tools developed in common for the planning and feasibility studies in the context of implementing high-speed railways,
- The positioning of possible applications of magnetic suspension technology for high-speed « suburban » applications,
- Demonstrator of the use of superconductivity for a powerful and effective, weight and energy-saving rail system,
- Franco-German technical dictionary reviewed and completed by the UIC.

### 1.2 A few results for Europe

- Knowledge of aerodynamic and acoustic problems on TGV, ICE and TR07, noise source identification and industrial solutions carried jointly to European and international level,
- New concepts for control-command and first steps towards the inter-operability of systems. The annex M allowed the launch of ERTMS at European level and the annex P the launch of LOCOPROL project and the use of GPS then GALILEO on low traffic railways.

### 1.3 Project management

Until 1998, the implementation of this cooperation was coordinated in France by the INRETS and the ministry of transport, as well as the German federal ministry of research and TUV. Since 1998, the DRAST, Department of research and scientific and technological animation in the ministry of Transport, ensures the French chairmanship by strengthening the links with all Predit financing partners.

### 1.4 the new rail projects since 2000:

#### **2000–2004 Crosswinds**

Objectives: - To compare methods used in Germany and France on the basis of cross experiments in wind tunnels and on actual sites.

- To define common measuring methods – submitting to standardization authorities

*Partners: SNCF, CSTB / DB AG, Siemens AG*

#### **2003–2006 NOVUM (Rail performance and wear & tear)**

Objectives: Study and assessment of rail performances and the phenomena connected to wear & tear compared to stress and operation.

*Partners: SNCF, CORUS, RATP, INRETS, LMS, INSA / DB AG, BAM, GKSS*

#### **2004–2007 LICOS (Light composite bogies)**

Objectives: Use of composite materials to reduce the weight of structures in rail rolling equipment: development, realization and approval of a composite bogie for the A-TER train.

*Partners : Alstom, SNCF / Alstom LHB*

#### **2005–2008 AOA (Aerodynamics in Open Air)**

Objectives: To acquire a greater knowledge thanks to an international cooperation on specific aspects of the interaction between vehicles and rail infrastructures: on aerodynamics and aspects of crosswinds.

*Partners: SNCF Recherche, Alstom / DB, Siemens, Bombardier*

## **2. Since 1998: first thematic widening**

In order to bring the national PREDIT and "Mobilität und Verkehr" programmes closer, a first thematic widening in 1998 gave rise to projects in the fields of telematics and road safety, urban transport and mobility.

### **2.1 Telematics and road safety**

#### **2000–2003 « IVHW » - Inter Vehicle Hazard Warning System**

Objectives: - To develop and assess a common system of warning and information between vehicles, to be deployed along European motorways and to analyse the potential market for such a system considering costs and efficiency.

Partners: *ISIS, Renault, PSA Peugeot Citroën, ESTAR, COFIROUTE, INRETS / Daimler Chrysler, Bosch, BASt*

#### **2003–2005 SafeMAP**

Objectives: To validate the economic efficiency and the technical feasibility of a digital card containing information related to road safety (signalling, road works, etc...)

Partners: *ISIS, Renault, PSA, NAVtech, LCPC / Daimler Chrysler, BASt, TeleAtlas*

### **2.2 Urban transport and mobility**

#### **2000–2004 « IRAMES » - Intelligent Ramp Metering System**

Objectives: - To define assessment parameters and criteria of traffic regulation techniques when accessing motorways and urban ring roads depending on the characteristics of these infrastructures and traffic scenarios.

Partners: *CERTU, SIER, CETE Bordeaux, ZELT Toulouse / SSP Consult GmbH, Dambach Werke GmbH, Fraunhofer Gesellschaft IV*

#### **2000–2004 "BahnVille I "**

Objectives: To study the relationship between urban development and rail infrastructure development. To identify examples and strategies of railway revitalization connected to inter-modal behaviours.

Partenaires: *CERTU, SNCF, INRETS, ADEUS, CETE / RWTH Aachen, ILS NRW, DB Services*

The results of the first phase were presented at the final seminar, on 18<sup>th</sup> – 19<sup>th</sup> October in Bonn. To disseminate these results in France also and to discuss the possibilities of applying this project, Deufrako organized a conference on BahnVille at La Défense, on 1<sup>st</sup> June 2005.

#### **2005–2007 CADMIUM: Demographic changes and impact on the use of modes and multi-modality**

Comparative study of transport modes in France and Germany due to demographic differences.

Partners: *INRETS / Karlsruhe University*

## II. The new activities launched in 2002

Following the 1st Franco-German research cooperation Forum in February 2002 in Paris, 4 thematic initiatives have been envisaged with different realization tools: the launch of a first common call for propositions on freight transport, the setting up of a thematic group on the noise issue, the reinforcement of exchanges between researchers' teams on road safety, projects on electronic ticket machines. The latter was subsequently abandoned. In parallel, it has been decided to launch actions to bring the two Predit and « Mobilität und Verkehr » national programmes closer.

### 1. Transport of goods: Green Freight Transport Corridors

#### 1.1 Procedure

After a substantial amount of preparation work from March 2002, the call was officially open on 12th December in France and Germany. Communication on the call was done in the work environment concerned. On 15<sup>th</sup> March 2003, the call was closed.

At the time of the closing, 12 projects have been handed at the Deufrako secretariat in France and in Germany. Among these projects, 6 concerned information platforms; 4 concerned operational or technical aspects and 2 projects were off the point.

Two independent experts in France and an expertise committee in Germany individually assessed these projects. Followed by a meeting of discussion on the results by the ministries in charge of the call on 28<sup>th</sup> May in Brussels. The French minister organized hearings on 26<sup>th</sup> and 27<sup>th</sup> June 2003 inviting some of the project managers.

On 9th July the Franco-German jury was held under the chairmanship of the two Deufrako chairmen, M. Isensee of BMBF and M. Perdrizet of the DRAST. The Jury agreed on the 2 following projects INDAGO and CORRECT, and on a feasibility study for the 2 other projects SINATRA and GOPAX.

#### 1.2 Project realization

The project manager of the BMBF, the TÜV, handles the German partners' follow-up and funding of the GFTC projects. In France, a series of negotiations with all the financing partners took place in order to share out the funds. Finally it is the DRAST, the DTT, the ADEME and the MR that give their funding agreement.

The InDaGo project, carried mainly by a Germano-Belgian operator and the SNCF Fret had to give up its proposal when the French partner pulled out. Following this failure, the steering committee agreed to also finance a feasibility study for the GrailChem project.

A second project pulled out after 2 years of management difficulties within the consortium and gaps in the work plan. This GOPAX project intended to have mixed passengers and freight trains running between Mannheim and Lyon.

#### 1.3 Present situation

Today three projects are being developed:

- **CORRECT: Corridor for Rail Equilibrium and Cooperation in Transports**  
Availability of an information system and information management tools enabling to have a global and shared vision of the state of the production system and the availability of rare resources (time-slot-, locomotives, driving agents)  
*Partners: SNCF, NESTEAR / DB Railion, Karlsruhe University, VWI Stuttgart*
- **SINATRA:** Modal transfer from road to an inter-modal river-rail chain through the use of innovative stackable mobile crates between the German Rhine-Ruhr basin and Lyon-Marseille.  
Results of the study are expected in April 2006.  
*Partners: MVA, Port de Strasbourg and de Mulhouse, SNCF / Uni. Stuttgart, SGKV, Kessel&Partner, CCS*

- **GRailChem:** Development of a central information and communication platform for more surveillance in chemical transport. Results of the study are expected end of 2005.  
*Partners: INRIA, AETS, log-o-Rail, ILL Europe, BIBA, European OXO, OHB Teledata, Timtec Teldatrans*

## 2. Reduction of transport noise

The setting up of a thematic working group on transport noise has been in preparation since October 2002. The first meeting opportunity between French and German researchers occurred in June 2003 when the BMBF invited a French delegation, under the chairmanship of the DRAST's manager, to take part in the intermediate seminar of the German research programme on noise reduction called "Leiser Verkehr" in Bonn. In this occasion and following the seminar, Deufrako organized a Franco-German workshop on the possibilities to cooperate. It was then possible to collect first declarations of intents.

The « noise » group has developed a written mandate for the objectives of the next three years. This mandate was presented during an information meeting at the French-German acoustics congress in March 2004 in Strasbourg. The first Franco-German experts' meeting took place on 18<sup>th</sup> June in Marseille, and produced a joint project on the road noise model (P2RN) with the LCPC and the BAST. The group's second meeting was held on 9th May 2005 in Munich and saw the appearance of a second project on the effects of noise on sleep, with the cooperation of the SNCF and ifado.

Ongoing project:

- **P2RN: Methods for the prediction of the emission and the propagation of rolling noise**  
Optimisation of new road pavement concepts with respect to tyre-road noise in a wider context of the abatement of road traffic noise.  
*Partners: LCPC, INRETS, Ecole des Ponts, BAST, Müller BBM, EUROVIA*

Project designated:

- **Noise effect on health**  
Health – complete physical, mental and social well-being Noise abatement – essential element of public health care  
*Partners: SNCF, CNRS, / Ifado (Barbara Griefahn), DLR*

## 3. "Road safety"

A Franco-German workshop got interested in road safety cooperation during the Deufrako seminar on 4th December 2003 (Berlin, 25th anniversary). In this occasion, it was suggested to organize an information meeting on the national projects INVENT (Germany) and ARCOS (France), which are both focusing on driving-aid systems.

First contacts have been made when a group of people in charge of the INVENT project and German researchers took part in the final seminar of the ARCOS project. A small group of ARCOS researchers met their German counterparts during the final seminar of INVENT on 28<sup>th</sup> April 2005 in Munich.

A meeting to exchange information had been planned and organized at the ministry of transport at La Défense for the summer 2004. But following the absence of French car industrialists, it was cancelled.

Ongoing project:

- **SafeMAP II:**  
The objective is to assess the socio-economic effectiveness of a dedicated digital map data.  
*Partners : ISIS, Renault, PSA, NAVtech, LCPC, DaimlerChrysler, BAST, Teleatlas*

Project designated:

- **Common driver performance database:**  
Tool for analysing normal, non-critical driver behaviour.  
*Partners : LAB, INRETS /, Volkswagen AG (Axel Tenzer), Bosch, DLR, 3 Universitys*

#### **4. Bringing together Predit and "Mobilität und Verkehr"**

The first intermediate seminar of both programmes was held during the celebrations of Deufrako 25<sup>th</sup> anniversary, on 3<sup>rd</sup> and 4<sup>th</sup> December 2003, in Berlin. During this event, part of the agenda was devoted to reflecting on the common points between the two national programmes, more specifically in three thematic workshops on Railways, road safety and urban transport.

At the Predit Convention in March 2005 in Clermont-Ferrand a workshop on Deufrako was held with the objective of having important actors from Predit and Mobilität und Verkehr to talk and define Franco-French research priorities.

#### **5. Organization**

##### **Structure**

Since the Lille steering committee in October 2002, a working group had the responsibility to propose a new structure to make Deufrako more transparent, more effective and to open the groups to new actors. Another concern was the scientific follow-up of current projects and the creation of a panel of experts to advise the steering committee on its decision concerning research priorities.

The new structure holds that thematic groups work on the basis of a mandate elaborated with the agreement of the steering committee, to define priorities and modes of action in the next three years. Two mandates have been elaborated to date, one for the noise group and one for the rail group.

##### **Secretariat**

Considering the extent of work jointly involved following the Franco-German research Forum, both countries have decided to provide themselves with a common secretariat. Financed half by the BMBF and the DRAST, this secretariat includes a project leader from December 2002 housed by the Drast, and is responsible for the follow-up and valorisation of the projects, and the organization of steering committee and other working meetings. Besides, bringing together the two national programmes has led – on the French side – to highly involving the Predit permanent secretariat in the implementation of new actions and funds coordination.

##### **Communication**

In order to give Deufrako a visual image, a graphic designer from the TÜV created a logo. An information leaflet on the state of current projects is regularly printed and distributed during the different animation and research events.

An Internet site has been created to communicate on the web on the work of Deufrako: [www.deufrako.org](http://www.deufrako.org). An internal information platform exists, but the groups have not used it yet.

Several information sessions have been organized to present Deufrako. The latest one was during a Deufrako workshop on « What role for bilateral cooperation in the European research area? » at the Predit Convention on 16<sup>th</sup> March 2005 in Clermont-Ferrand. On this occasion, representatives from French and German rail and car industries gave their opinions on the situation. During this Convention, two Predit research awards were given to the Franco-German projects: NOVUM and Crosswind.

##### **Steering committee meetings**

Since the new activities have started, Deufrako has needed meetings by the steering committee concerning financing decisions at a rate of one every 6 months. In fact, there will be a plenary meeting of information on the state of current projects and declarations of intents towards the end of the year. This meeting is open to all research actors involved in Deufrako projects, projects managers and financing partners, and the Deufrako group's chairmen. A decision-making meeting restricted only to the financing entities is normally held in April each year. The location for these meetings varies between France and Germany.

Since 2002 took place the following steering committees:

10/10/2002 plenary session in Lille / Villeneuve d'Ascq: final decision on the text by the GFTC

09/07/2003 decision-making meeting in Paris: Franco-German jury of the GFTC

03/12/2003 plenary session in Berlin

09/7/2004 decision-making meeting in Paris

18/11/2004 plenary session in Lyon

13/04/2005 decision-making meeting in Bonn: preparation of the 2<sup>nd</sup> Franco-German Forum

24/11/2005 plenary session in Bordeaux

### III. 2<sup>nd</sup> Forum and prospects

In the context of the preparation of the second Franco-German research cooperation Forum on 6<sup>th</sup> and 7<sup>th</sup> July 2005 in Potsdam, ministries and institutions involved in DEUFRAKO have begun a reflection on future research priorities, in the continuity of the existing works. The transport experts' group was invited to discuss the relevance and feasibility of the following proposals:

- To reinforce road safety
- In the field of railways, to reinforce rail safety and inter-operability
- To open a thematic approach on hybrid motorizations
- To open a thematic approach on the environment efficiency and the inter-modality of road transport of goods

#### New activities

It was decided to realize the following actions:

Organization of workshops:

- On **road safety**, technological aspects for the industrialists, and to advice politicians, and a seminar to exchange ideas between the ARCOS and INVENT projects