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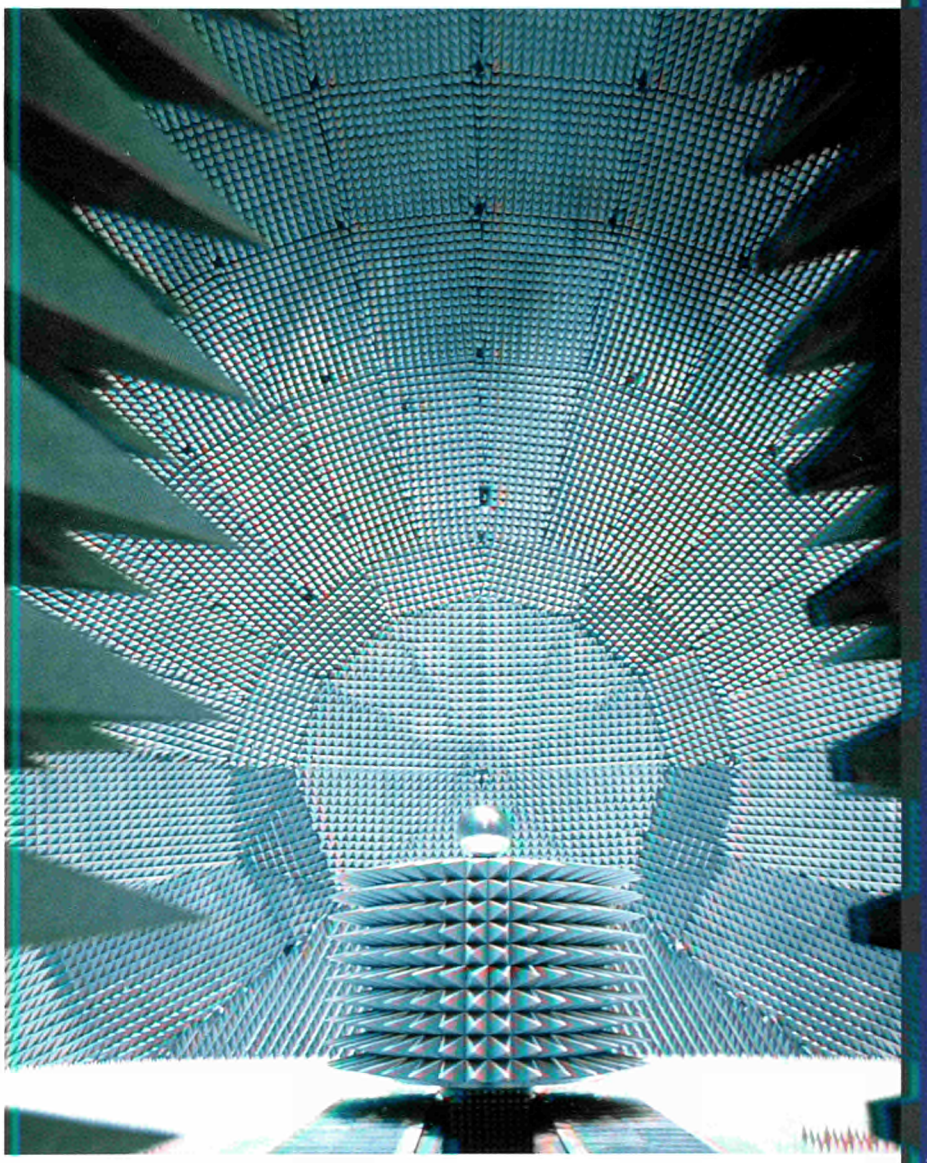

DG XIII-D

Directorate for Dissemination and Exploitation of RTD Results, Technology Transfer and Innovation

The VALUE Programme In-Depth

+ FOURTH FRAMEWORK PROGRAMME UPDATE • SPRINT NEWS • JRC CASE STUDY • AND MORE

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SPRINT in the Fourth Framework Programme

Editorial by Dr. A. S. Strub, Director for Dissemination and Exploitation of RTD Results, Technology Transfer and Innovation

AS REPORTED IN THIS ISSUE, *the structure and budget of the Fourth Framework Programme for research and technological development are falling into place ('Policy News', page 3-5).*

One of its features is that it will merge the work of the SPRINT and VALUE programmes. The aim of SPRINT is generally to encourage innovation and stimulate the transfer of technology, both between business sectors and between the different regions of Europe. Up to now SPRINT has been outside the framework programme system. By putting SPRINT on the same administrative footing as the VALUE programme, initially set up under the Second Framework Programme and concentrating specifically on promoting the dissemination and utilisation of the results of Community research (see Dossier article, beginning page 6), the existing strong links between the two programmes will be even further reinforced.

THE CURRENT SPRINT PROGRAMME WOULD HAVE *ended at the end of 1993. At its meeting in Brussels on 20 December, the Council approved a one-year extension, together with extra funding of 19 MECU to cover the 1994 work programme. This will allow the work of SPRINT to be continued and reinforced, and to prepare for its integration into the Fourth Framework Programme in the near future.*

By that time, the main phase of SPRINT will have been running for more than five years. Initially it was seen as largely experimental - now it has become an established programme, but one within which experimentation is possible and welcomed.

AN EXAMPLE IS THE SPRINT SCHEME TO HELP SMES *make use of new technologies. Known as MINT (Managing the Integration of New Technologies), the scheme is administered and run in each Member State at national or regional level. Each state can adapt the scheme to suit local circumstances, while SPRINT ensures general coordination and a sharing of experiences and results.*

This is a fine example of the scope offered by SPRINT as a test-bed for pioneering ideas and schemes. It is also a model for the way in which comparatively modest Community resources can be used to develop a coherent Europe-wide approach to technology diffusion, building on structures at the national and regional level. ■

European RTD: The Road Ahead

Preparation for the Fourth Framework Programme, within which most European RTD Programmes will be organised for 1994-1998, has made further progress. At the end of last year, Ministers of the Member States reached agreement on the overall budget and its breakdown into subject areas. One of the four main areas, 'Activity 3', is devoted specifically to exploiting research results.

Following the 1987 Single European Act, Framework Programmes are both the basis and instrument of European research and technological policy, setting aims and priorities as well as outlining the budget for research support towards long-term overall objectives. The individual research projects, which usually receive support up to 50% of their costs, must involve partners from at least two Member States, involve generic, precompetitive research and obey the principle of subsidiarity - research that can be carried out at national level should not be elevated to the European level.

The global budget agreed by the Ministers is 12 billion ECU, with the possibility of a further 1 billion ECU to be released by mid-1996, depending on economic circumstances. The Fourth Framework programme is composed of four Activities:

■ **Activity 1:** Programmes of Research, Development and Demonstration: 10,536 million ECU.

The actual RTD Programmes ('Specific Programmes') are carried out under this Activity, which takes up the lion's share (87.8%) of the total budget. They are detailed in the following section.

■ **Activity 2:** Cooperation with Third Countries and International Organisations: 420 million ECU.

International cooperation can take place in two ways - as part of the Specific Programmes and on a centralised basis, which is what this Activity is concerned with. EUREKA will remain the principal vehicle for supporting 'near market' RTD activities.

■ **Activity 3:** Diffusion and Valorisation of Results: 300 million ECU.This centralised action is the successor to the current VALUE II Programme (see Dossier) as well as other EC activities in technology transfer, in particular the SPRINT Programme (see interview with Dr. Strub, p. 5).

In addition to the funds allocated to Activity 3, a further 1% (on average) of the total Framework programme budget is to be earmarked for dissemination and optimisation of results, in the framework of Activity 1. Activity 3 also includes a 'Scientific Services for Community Policies' heading, under which scientific support will be given to Community policies at the request of the Directorates-General in charge of these policies.

■ **Activity 4:** Training and Mobility of Researchers: 744 million ECU.

While training and researcher mobility actions will be carried out under each Specific Programme, this Activity will, among other things, further develop Europe's scientific human resources by addressing advanced training in centres of excellence throughout the Member States.

▷ ACTIVITY 1

Seven Main RTD Areas

A number of new themes apply to all the Specific Programmes, including new actions to encourage market orientation and SME participation, both within projects and in exploiting them. Most of the Programmes follow on from those of the Third Framework Programme, with the notable addition of Transport and Targeted Socio-Economic Research.

■ **Information and Communications Technologies**

The largest single Specific Programme, reflecting the importance of these technologies. The main areas of RTD are:

- Information Technologies: towards a highly accessible and usable information infrastructure, from multimedia software to flat panel displays
- Advanced Communications Technologies: building on the achievements of the RACE Programme, with a greater focus on stimulating innovative use.
- Telematics Applications of Common Interest: developing telematics infrastructures for transport, health care, researchers, education, improving the quality of life and more.

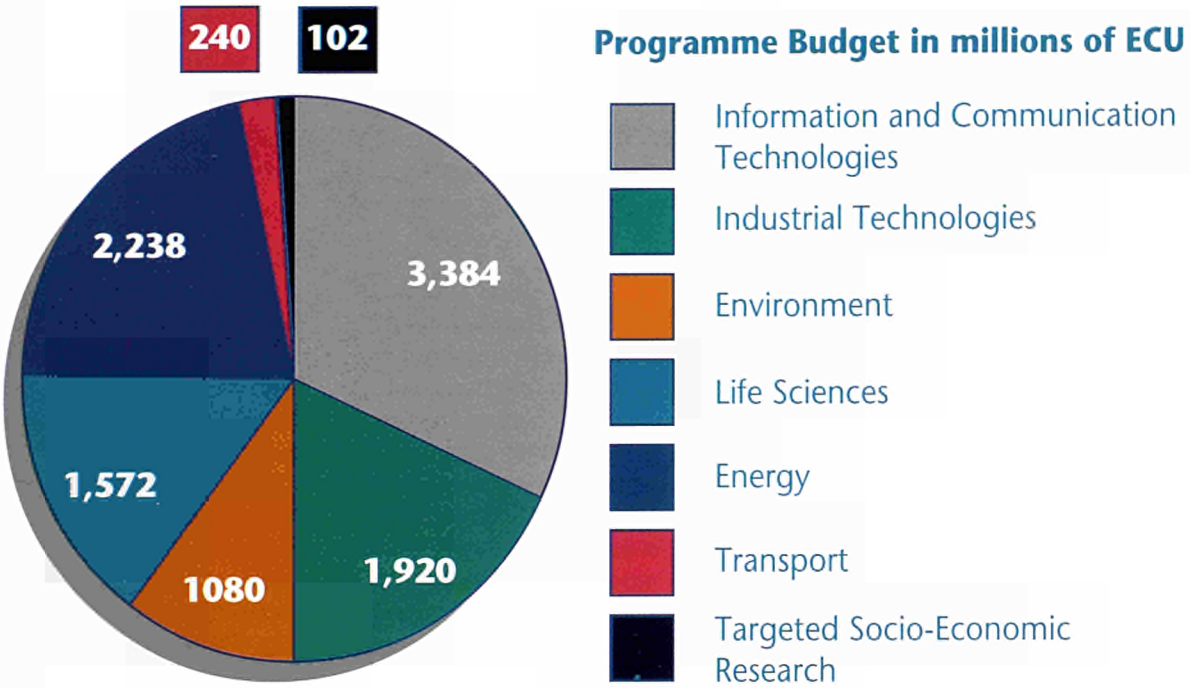
■ **Industrial Technologies**

Promoting the development, integration and application of critical generic technologies applicable at the various stages of the life cycle of products and materials.

Four areas of research:

- Design, engineering, production systems and human-centred management
- Materials and materials-related technologies
- Advanced propulsion technologies

Activity 1: 7 Main RTD Themes



●●● - Research concerning standards, measurement and testing

■ Environment

The Fourth Framework Programme stresses the importance of promoting sustainable development and making environmental protection an aspect of industrial competitiveness in all its RTD activities. In addition, work under the Environment heading will focus on three topics:

- the natural environment, environmental quality and global change
- environment-related technologies
- Earth observation and the application of space technologies

■ Life Sciences and Technologies

This programme will adopt a global approach, with an emphasis on the socio-economic application of scientific and technical achievements, especially by SMEs. Research will cover:

- biotechnology
- biomedical and health research
- the application of life sciences and technologies to agriculture and fisheries (including agro-industry, food technologies, forestry and rural development).

■ Energy

Guided by three underlying principles: energy security in the broad sense, environmental concerns, and a consideration of the entire technological process, from R&D to deploying technologies on the market.

Three main areas of research:

- Non Nuclear Energy (involving improved energy conversion and use, introduction of renewable energy resources)
- Security of Nuclear Fission (reactor safety, management and storage of long-lived radioelements, the risk of diversion of fissile material)
- Controlled Thermonuclear Fusion, combining the efforts of all Member States, Sweden and Switzerland in the field of controlled thermonuclear fusion by magnetic confinement.

■ Research for a European Transport Policy

The first Specific Programme devoted to Transport Technology reflects the need to balance the rapidly increasing traffic volume in the Single Market with environmental and other considerations. The Programme's main objectives concern:

- integrating each transport mode (road, air, rail, maritime, etc) into a coherent trans-European network
- optimising transport networks.

■ Targeted Socio-Economic Research

Promoting cooperation and coordination in areas of socio-economic research of major importance to science and technology policy decisions, at European and national levels. Research will be in three sections:

- evaluation of science and technology policy options
- research on education and training
- research on integration in Europe and social exclusion phenomena

Together, the seven main research areas within Activity 1 will involve an investment of 10,536 million ECU.

Dissemination and Exploitation: A Greater Emphasis

Activity 3 of the Fourth Framework Programme is devoted to the diffusion and optimisation of results, and will further integrate all the EC's efforts in these areas under one programme. According to Dr. A. Strub, Director of DG XIII/D (Dissemination and Exploitation of RTD Results, Technology Transfer and Innovation), this will consolidate and enhance Europe's ability to convert its undoubted scientific prowess into internationally competitive products and services.

Dr. A. S. Strub, Director of DG XIII/D

■ Is this the first time that the dissemination and exploitation of research results has been given such priority?

❑ Yes, certainly. Dissemination and exploitation is now one of the four major headings of the Fourth Framework Programme, giving these themes a much higher profile. What we are seeing here is the continuation of a long-term trend. As each Framework Programme succeeds its predecessor, the role of dissemination and exploitation has become more prominent. On the other hand, the current situation is that the funds proposed under this heading of the Fourth Framework Programme are not as high as the European Commission originally proposed, or as the European Parliament wished.

Nevertheless, I expect that the dissemination and exploitation work which was begun under the Second Framework programme, and is now being developed and expanded under the Third, will make further strides forward under the Fourth.

■ What, in your view, are the main features of Activity 3?

❑ From my point of view, one of the main features is the inclusion of work which up to now has been done under SPRINT. Both SPRINT and VALUE are run from within my Directorate, and both programmes operate in the technology transfer area. VALUE concentrates on promoting the dissemination and exploitation of the results of Community-funded research, whereas SPRINT has a brief which is much broader - to contribute towards the creation of a better environment in Europe for innovation and technology transfer.

Up to now the administrative basis of the two programmes have been quite different, with VALUE within the framework programme system and SPRINT outside it. The two programmes have much in common and many shared interests, and the physical proximity of the two management teams means that coordination and cooperation between them is excellent. But having both under the same administrative 'roof' will further improve coherence between the two programmes and facilitate the undertaking of integrated joint projects.

By the way, this poses a nomenclature problem. Should we keep the names VALUE and SPRINT, which everyone knows, or should we find a new name to cover both activities and to demonstrate that they are merged?

Another point worth noting is that the network of organisations set up under the THERMIE programme to promote energy technologies is also put under Activity 3. That adds even more opportunities for a shared approach.

■ How will the financial environment for SMEs and European industry in general be improved to make taking up new technologies easier and more attractive?

❑ One of the objectives of Activity 3 is to improve the financial environment for the dissemination of technology. There will be two main strands to this.

One will target the interface between the financial world and innovative firms. The aim will be to improve communication across this interface, and facilitate investment in technological projects. SPRINT has already done some work in this area - the SPRINT Investment Fora, for example.

The other strand will involve pilot financial schemes specifically aimed at encouraging SMEs to make use of research results and new technological developments. The SPRINT Technology Performance Financing Scheme, which has been a forerunner in this area, will be continued. We still hope that - notwithstanding the reluctance of some Member States - the Commission will also be authorised to try out a new financial 'instrument', and that the funds finally made available to Activity 3 will allow it. This instrument is intended to improve the possibilities for financing the uptake of technologies and RTD results by SMEs, and will be adapted to the needs and practices of each Member State.

Getting Better

The VALUE Programmes were founded to help European industry exploit Development (RTD) Programmes. This Dossier article highlights the recent different ways it has already helped transfer scientific results into industrial

Networks, Information Sources and Direct Assistance for disseminating and exploiting EC RTD Results

The overall philosophy of both the VALUE (1989-1993) and VALUE II (1992-1994) Programmes is to improve European industry's access to the results of the EC's research efforts, including the Specific Programmes within the Framework Programmes and other Programmes run independently. The VALUE II Programme coordinates and supplements the dissemination and exploitation performed by the individual Programmes by:

- developing an effective European infrastructure, through which results may be disseminated and partnerships formed, and
- directly supporting the transfer of results generated by the Programmes into European industries.

The VALUE Programmes do not just concentrate on current Programmes - much worthwhile research was performed before the Third Framework Programme, and VALUE can carry it through to the markets.

VALUE also features special awards for SMEs, a wide range of promotional activities and some activities in the field of Intellectual Property Rights (IPR). And under the Fourth Framework Programme for 1994-1998 (pages 3-5), the results of national programmes and other intergovernmental organisations (such as EUREKA) can also be disseminated throughout Europe using the VALUE Programme's infrastructure.

I. THE CORDIS INFRASTRUCTURE

A major element of the VALUE Infrastructure is the Community Research and Development Information Service (CORDIS). Launched in 1990, CORDIS answered the pressing need for a centralised source of information, bringing most of the information on the European Commission's R&D activities together in a parallel series of on-line databases. It can be accessed by anyone with a modem and telephone line connected to their computer, and costs nothing bar the telephone bill.

Through CORDIS, users can quickly and easily find the information they need from their office, using the user-friendly search and retrieve programmes. There are a total of 8 databases (see 'Databases' Box), and between them users can keep up to date with the latest developments (RTD-NEWS), search for publications relevant to their research (RTD-PUBLICATIONS), find a research partner (RTD-PARTNERS), learn of a new prototype (RTD-RESULTS) and discover who is involved in different EC Programmes (RTD-PROJECTS), to name just a few uses.

As a resource, CORDIS supplies a very complete picture of the EC's research activities. RTD-PROGRAMMES, for example, provides complete coverage of all Programmes both within and outside the first three Framework Programmes, almost complete coverage of activities initiated before the First Framework Programme, and significant coverage of related programmes (energy, environment, training and education, regional development, etc).

It is also a very powerful tool for an organisation wanting to exploit R&D results and connect up with other organisations around Europe. There are almost 10,000 results listed in RTD-RESULTS, while the details of the 8,000 or more organisations provided by RTD-PARTNERS are examined by users at least 600 times every month.

VALUE from R&D

the results of the European Community's Research and Technological accomplishments of the VALUE II programme, and looks at the many technologies.

Cordis CD-ROM Promotion

1994 will see the launch of two new CORDIS products: WATCH CORDIS and CORDIS CD-ROM. WATCH CORDIS is a Windows-based interface for the CORDIS system, which will make it much simpler to use, particularly for those unfamiliar with databases. It will allow users to prepare a query without needing to look up codes,and to customise their query forms.

CORDIS CD-ROM complements the on-line databases, and should reduce users' telecommunication expenses. Subscribers receive a compact disc containing CORDIS data every three months, enabling them to browse at will without cost. The data is six weeks old by the time it arrives, however, so if the latest information is needed they will still need to use the on-line databases.

The difference is the cost. Users can search through the CD-ROM data, using an interface which is converging towards that of WATCH CORDIS, and then, if necessary, push *(cont. page 8)*

CORDIS on CD-ROM: bringing data on the EC's RTD Programmes closer to a wider range of organisations

VALUE interfaces for Science and Society (interfaces II & III)

The original VALUE Programme focused on improving relationships between the EC's research Programmes and industry, working at the 'Research & Industry' interface. In 1992, however, two more Interfaces were added:

□ **INTERFACE II**, 'Research and Scientific Community' (4 MECU): a framework for reflecting on the institutional, legal, socio-cultural and other mechanisms and practices which influence the performance and exploitation of RTD

□ **INTERFACE III**, 'Research and Society' (3 MECU): assessing the social impact of science, communicating science to the public and analysing public demand and new requirements.

These Interfaces have recently brought together the results of their first year's activities, ranging from analyses of public demand for technology to multi-disciplinary studies into the economics, management, communication and general context of research. As a result, three groups of initiatives are being explored:

■ **Communication of Science and Technology (S&T)**

• enhancing public knowledge of S&T processes and results

• reinforcing communication between industry and S&T policy advisors regarding the exploitation of policy studies and the improvement of research programme management

■ **Awareness Initiative**

Promoting and disseminating methodologies, instruments and tools to allow the participation of interest groups in the decision-making process, while simultaneously raising awareness of their relationships with S&T developments. These instruments should bring the experience and knowledge gained at European level to the national, local and sectoral levels.

■ **Assessment of the Impact of Technologies**

• reinforcing Technology Assessment (TA) infrastructures and activities to bridge the gap between scientists/ technologists and managers, providing an understanding of the socio-economic impact of specific technologies and options.

• to involve: TA training scheme, European TA database, Clearing House for projects, institutional information and technological policy developments and a European TA newsletter.

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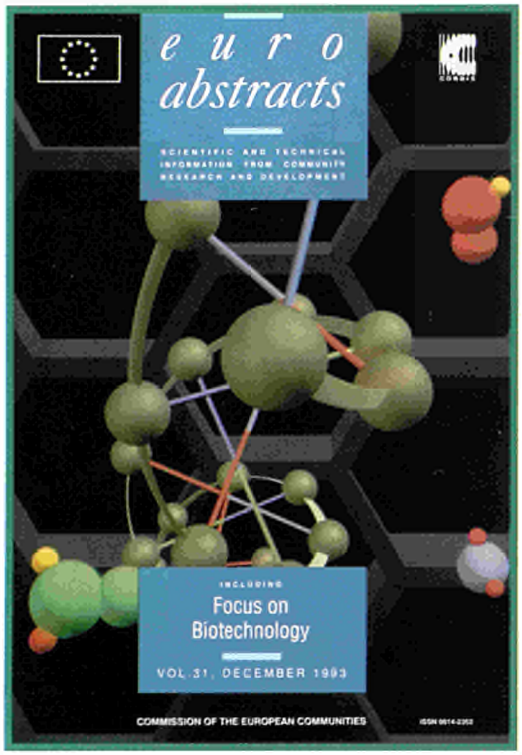
The CORDIS Databases



The December 1993 issue of EuroAbstracts contains articles on the EC's Biotechnology RTD activities and SPRINT's Science Parks initiative, as well as extracts from the CORDIS RTD-News database and over 100 abstracts, extracted from RTD-PUBLICATIONS.

The information is provided by all European Commission departments with any relevance to RTD, as well as some sources outside the Commission. The working language is primarily English.

- RTD-PROGRAMMES: Updated monthly, details on all EC RTD and related Programmes.
- RTD-PROJECTS: Updated monthly, more detailed information on activities within the Programmes (projects, studies, etc).
- RTD-PUBLICATIONS: Updated fortnightly, bibliographic details of over 60,000 publications, documents and reports stemming from the projects, as well as references to scientific and technical documents published by the EC which are not related to any specific RTD Programme.
- RTD-COMDOCUMENTS: Updated daily, information on EC Communications to the Council and Parliament on RTD activities. Uses include searching for advance information on proposed programmes.
- RTD-ACRONYMS: Updated monthly, a guide to the array of acronyms and abbreviations arising from EC RTD activities (excluding technical abbreviations).
- RTD-NEWS: Updated daily, the latest news on all aspects of EC RTD activities, including calls for proposals and tenders, events, publications, Commission proposals, activities in preparation, EC legislation and policies affecting RTD matters and the progress and results of RTD programmes.
- RTD-RESULTS: Updated monthly, news on the results of EC and other RTD projects. Open to contributions.
- RTD-PARTNERS: Updated fortnightly, a partner search database listing thousands of profiles of organisations seeking partners for EC or other RTD projects. Open to contributions.

In the future, a new database will be added to provide users with details of local and European-level contact points, which can provide them with information on EC research. In addition, extracts from these databases are published in printed form. CORDIS Focus, a 16-20 page newsletter, is published every fortnight; EuroAbstracts is a monthly abstracting journal of publications taken from RTD-PUBLICATIONS, and also includes feature articles on research topics. Directories based on the RTD-Projects and RTD-Partners databases are published around once a year (see Publications, page 24).

• To contact CORDIS, see the Quick Reference Guide (centre pages).

●●● *(cont. from page 7)* the 'Update' button. This will send the query to the on-line databases, collecting any relevant information which has been added since the disc was published. As the query is prepared beforehand and only a little data is actually transmitted, expenses are kept to a minimum.

CORDIS CD-ROM thus brings data on the EC's RTD Programmes closer to a wider range of organisations, particularly smaller companies which cannot afford the 'unexpected' telephone charges some on-line databases produce. The system interface is currently available in English and Italian, with German and French versions due to appear in the next 6 months. And around 5,000 copies are being disseminated free of charge from the beginning of this year.

II. THE RELAY CENTRE INFRASTRUCTURE

Another major element of VALUE's infrastructure was established in 1993 - a network of 27 VALUE Relay Centres (VRCs). Operating under the principle of subsidiarity, each VRC is dedicated to bringing the RTD Programmes closer to organisations in its local region.

If you are a:

- manufacturing company, small or large
- university or other educational establishment
- research laboratory, public or private
- consultant specialising in a particular technology or industrial sector
- technical information intermediary or advisory organisation
- financial institution

then your local VRC is there to help you (for a complete list of the VRCs, see the Quick Reference Guide, centre pages). VRCs provide two basic types of services:

- 'Upstream Activities': helping local organisations get involved in EC RTD programmes
- 'Downstream Activities': helping local organisations exploit the results of EC RTD programmes

As each VRC is oriented towards the local environment, each one operates differently. One of the three VRCs in the UK, for example ('The Technology Broker', profiled in issue 4/93), is a

private company specialising only in downstream activities. Other VRCs, by contrast, are hosted by national or regional government offices, Chambers of Commerce and so on.

Focused Technology Transfer Conferences

In practical terms, there are many ways a VRC can aid the exploitation of Programme results. One of the most common over the Network's first year has been the Technology Transfer Day, which bring the 'owners' of the research result together with companies interested in developing it for the market.

To organise such an event, the VRC first studies the companies in the local area, making personal contact wherever possible and building up profiles of the entire region's industrial abilities and requirements.

As a result, the VRC will usually identify one or more needs among the local companies for a specific type of technology, whether it be CAD/CAM software for the local garment industry or Total Quality systems for an industrial manufacturing region. Using their contacts with the research Programmes, they then select a number of projects which may fulfil that need, and organise a meeting to bring them all together.

For the local companies, Technology Transfer Days provide the opportunity to:

- discover new technologies relevant to their needs
- meet potential partners, licensees and exporters in their field
- exchange ideas on their own activities, and make strategic alliances
- obtain an Exploratory Award, worth 7,000 ECU (see page 15)

For the researchers from the RTD project, the event allows them to assess their technology, providing them with a quick appraisal of potential markets and the chance to meet new partners and compare their solutions with those developed in other projects.

III. VALORISATION ACTIVITY: DIRECT ASSISTANCE

A crucial element of the VALUE II Programme is the 'Valorisation Activity', where companies are directly assisted in exploiting the *(cont. page 10)*

The 1992 Call for Proposals

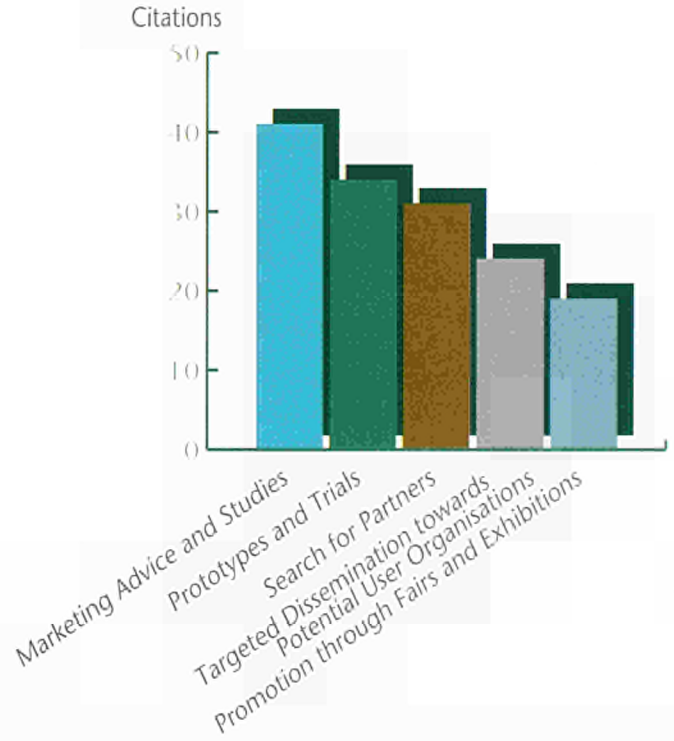
The 1992 Call for Proposals generated 84 submissions, requesting a total of just over 13 MECU. Exactly half proposed to exploit results from the Information and Telecommunication Technologies Programmes, while another 27 resulted from the Materials and Industrial Technologies Programmes. Quite a few of the research results involved stemmed from the first two Framework Programmes, demonstrating VALUE's ability to continue on after the Programme itself has officially finished (see the Case Study on page 15).

Of the 84 Proposals:

- 12 proposals concerned preparatory market studies or requests for support for participating in promotional activities (exhibitions, etc). Their low budgets and immediacy demanded a quick assessment. 10 of the 12 were quickly approved, receiving a total of just over 400,000 ECU.
- 72 were evaluated by an independent panel of experts, split up into three sectors: Life Sciences (8 proposals); Information and Communications Technology (32); Industrial Materials and Technologies (32). Of these, a total of 29 were finally accepted (6 from Life Sciences, 11 from IT/Telecommunications and 12 from Industrial Technologies), receiving around 3.5 MECU between them.

Hence 39 of the 84 were approved, demonstrating the competitiveness of the system. The 1993 Call for Proposals, which is still being processed, will be even more so: over 300 Proposals have been received, but the final list is not expected to be any longer than in 1992. The projects were again dominated by Information and Communication Technology, Advanced Materials and Life Sciences.

VALUE Support to Exploitation for BRITE/EURAM projects



The 84 BRITE-EURAM projects covered in the 3rd BRITE-EURAM/VALUE Evaluation requested a total of 149 Supports to Exploitation. 75% of these were made via VALUE, particularly marketing advice, prototypes and trials, targeted dissemination and partner search. The latter two concerned mainly the Relay Centre Network. Data: 3rd BRITE-EURAM/VALUE Evaluation.

(cont. from page 9)

results of the EC's Programmes. Every year since 1990, VALUE has issued a Call for Proposals, inviting European organisations and companies to take up and exploit the results of EC-supported projects.

The EC's assistance can take many tangible forms:

- market studies
- technological and/or feasibility studies
- production of promotional material and activities
- partner search
- financing prototyping and testing.

Each proposal is evaluated on the project's level of innovation and technical quality and the proposal's expected market impact, exploitation strategy and opportunities. An idea of the evaluation process and success rate can be gained from examining the 1992 Call for Proposals (see 'Call for 1992 Proposals' Box).

Focus on SMEs

Naturally, the original participants of the RTD projects feature heavily in the valorisation proposals, which must have organisations from at least two different Member States. However many other companies are well-placed to exploit these results, and it is to help SMEs in this category that the VALUE II Programme, in collaboration with DG XXIII (responsible for, among other things, enterprise policy), has introduced two awards:

- 'Exploratory Award': around 7,500 ECU for SMEs wishing to exploit the results of projects they were not originally involved in. To help the SMEs make initial contact with the owners of the result and discuss possible partnership agreements. If successful, the SMEs may qualify for a Technology Exchange Award.
- 'Technology Exchange Award': up to 100,000 ECU to help SMEs meet the costs of adapting the technology developed in the original research project to their needs.

Case study: valorisation

Measuring Surface Tension

In 1989 the French national laboratory CNRS Marseilles and its partners in universities in the Netherlands and Germany finished their project into investigating the effect of enzymes on the surface tension between two fluids*. In March 1990, the French SME 'IT Concept' was created specifically to develop some of this technology for the market. Which, along with their Danish partner Novo Nordisk and the aid of a Valorisation project, they have successfully done.

Photo: IT Concept

Measuring surface tension between two fluids.

An enormous range of industrial processes involve hydrolysing oils, where lipases or other enzymes catalyse a reaction between oil and water, degrading the complex oil molecules. Industries as diverse as cosmetics and pharmaceuticals are interested in making this process as efficient as possible.

The enzyme works by reducing the surface tension between the oil and water. It is therefore essential to be able to measure this surface tension accurately, a need which IT Concept's tensiometer, developed from technology transferred from the CNRS, fulfils.

"Our tensiometer works by placing the tip of a syringe needle into a mixture of water and the enzyme being tested," explains Mr. Alain Cagna, director of the French SME. "The syringe is filled with the oil, and a small droplet is pressed to the tip of the needle. A CCD camera records the shape of the oil/water interface, which our image processing software then analyses to determine the surface tension between the two fluids."

Three-Phase Assistance

The VALUE Programme helped IT Concept in many ways. To begin with, after the French company's initial application, the EC performed a market survey and partner search. This identified a long list of clients for this technology around the world, including the world's first enzyme producer, Danish company Novo Nordisk, who joined IT Concept in the main phase of the VALUE project.

The partners were then granted a total of 200,000 ECU to develop three prototypes, which have now been installed at CNRS Marseilles, Novo Nordisk and IT Concept. "In addition," Mr. Cagna comments, "we have shown our product at international exhibitions through the EC's stands, and the VALUE Programme has acted as a 'letter of introduction', helping us approach many more customers. All this is very valuable for an SME."

The market research found a global demand for around another 150 tensiometers in the company's first market - testing lipases for industries as diverse as detergents, agri-foods and pharmaceuticals. Future adaptations will also open up the petroleum, lubrication and construction industries, and they have already started a collaborative investigation with a road building company into improving asphalt.

1. Biotechnology Action Programme (BAP), Project 0062F

(Value Dossier cont. page 15)

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QUICK REFERENCE GUIDE

Remove this 4-page pullout and keep it aside - it lists many sources of general information on the EC's RTD Programmes, including local and regional offices providing information on European RTD. It will be referred to extensively in future editions of Innovation and Technology Transfer.

▷ DATABASE SOURCES

CORDIS: On-Line and on CD-ROM

Much of the information on the EC's RTD activities is available through on-line database services, accessible via modem through ECHO, the European Commission Host Organisation. The most important of these is CORDIS - the Community Research and Development Information Service (see issue 1/94 for more information).

CORDIS was launched in 1990 to provide a centralised source of information on Community RTD, and costs nothing to access bar the telephone bill. The information in the 8 databases is provided by all European Commission departments with any relevance to RTD, as well as some sources outside the Commission. The working language is primarily English.

The databases are RTD-Programmes, RTD-Projects, RTD-Publications, RTD-Comdocuments, RTD-Acronyms, RTD-News, RTD-Results and RTD-Partners. Between them, users can keep up to date with the latest developments, search for publications relevant to their research, find a research partner, learn of a new prototype and discover who is involved in different EC Programmes, to name just a few uses. Another planned database will provide users with details of local and European-level contact points.

CORDIS is releasing two new services in 1994:

- WATCH CORDIS, a new Windows-based interface which will make CORDIS much simpler to use, allowing users to prepare a query without needing to look up codes
- a CORDIS CD-ROM subscription service: the quarterly CD-ROM will reduce users' telecommunication expenses and bring the data on the EC's RTD activities closer to a wider range of organisations, particularly smaller companies.

Other Databases

Other databases available through ECHO specialise in EC biotechnology and materials projects, as well as projects within the EUREKA Initiative. Of particular interest is the I'MGuide database, which provides information on databases and database producers, host organisations, CD-ROMs, PTT contact points, gateways and information brokers in Europe (see page 19-20).

In addition, the EC's commercially oriented host service (EUROBASES) offers seven databases ranging from EC law to press releases. Of possible relevance to RTD issues:

- ECLAS - bibliographic database of the European Commission library
- SCAD: official documents and articles from journals (also available on paper form as the SCAD bulletin)
- SESAME: energy technology demonstration projects

• **CONTACT:**
EUROBASES Help Desk,
Brussels
✆ **Tel:** +32 2 295 0001/0003
✆ **Fax:** +32 2 296 0624

Lastly, a network of National Awareness Partners (NAP) exists to disseminate information regarding the European electronic services market and to organise appropriate awareness activities at local and national level. The InfoNap file provided on ECHO contains the NAP contact names and addresses, or contact the ECHO Help Desk.

THE CORDIS AND ECHO HELP DESKS

Located in Luxembourg, ECHO hosts many of the EC's on-line databases, including CORDIS. Users of ECHO services also receive a quarterly newsletter, free of charge.

- The **ECHO Help Desk** can be reached free of charge on the following numbers:

✆ Belgium: 0800 1 8456
✆ Denmark: 800 10 756
✆ France: 05 905 956
✆ Germany: 0130 823 456
✆ Ireland: 1800 555 256
✆ Luxembourg: 0800 3456
✆ The Netherlands: 060 223 356
✆ UK: 0800 899 256

All other countries, at normal charge:
✆ TEL: +352 3498 1200;
✆ FAX: +352 3498 1234

- The **CORDIS Help Desk**, within the ECHO Help Desk office, can be reached as above, or on:

✆ TEL: +352 3498 1240
✆ FAX: +352 3498 1248
✆ EMAIL: X400: C=DE;ADMD=DBP; PRMD=GEONET; S=CORDIS-HELPDESK

PRINTED SOURCES

Publications and Journals

The following publications and journals provide a general introduction to, and broad coverage of, the EC's RTD Programmes. To obtain a publication or journal, remember:

- **Unless mentioned otherwise, the publication or journal is free**
- **The Catalogue number helps to obtain an EC publication**
- **Sometimes a name and fax number is supplied for obtaining the publication.**
- **If not, *for any EC publication with a price listed in ECU*, contact your nearest Sales Agent (see page 14).**
- **Otherwise, the RTD Help Desk (see Box, below) may be able to supply the document, or give you the right number for the person who can.**

General Introductions

For information on contacting the individual Specific Programmes, as well as a clear overview of EC research activities, the following publications are useful:

■ **'INFOGUIDE: GUIDE TO SOURCES OF INFORMATION ON EUROPEAN COMMUNITY RESEARCH', 2ND EDITION**

Catalogue Number: CD-NA-14775-EN-C. 12 ECU. 90 pages, published in English in 1993. Provides:

- Background and overview of the Second and Third Framework Programmes as well as other research-related activities:
- Broad sources of information
- Overviews and information sources (publications, help desks, videos etc) for all research and related programmes

■ **'EC Research Funding, A Guide for Applicants', 3rd Fully Revised Edition, 1992**

Catalogue Number: CD-NA-14122-EC-C. 10 ECU. 180 A5 pages, published in English, French, German, Italian and Dutch.

Covers the research programmes for 1990-1994 (both within and outside the Third Framework Programme) in five parts:

- 'Research and Technological Development: Building Blocks for European Union',
- 'From the Idea to the Project',
- 'EC Contracts - not shrouded in mystery'
- 'An Outline of the Programmes of the Third Framework Programme': 2 pages per Specific Programme.
- 'Related Programmes outside the Third Framework Programme'

In addition, two annexes provide sources of information and information on databases.

■ **'EU-FUNDED RESEARCH AND TECHNOLOGICAL DEVELOPMENT'**

Catalogue Number: to be assigned; English (other languages to follow)

Published as this edition of *Innovation and Technology Transfer* goes to press, this 84-page 'How To' manual is designed to make the EC's management of its RTD Programmes more transparent, supplying researchers with the information they need to get involved without snowing them under with administrative detail. Two parts:

- 'An Insight into the Handling of Project Proposals': the process for organising the evaluation of the proposals after they have been submitted and the selection of which proposals to fund;
- 'An Introduction to Contract Negotiation': the processes of negotiating an RTD contract and subsequent project management

• **CONTACT:** Donatella Fassone, European Commission, DG XII, Brussels
✆ Fax: +32 2 295 82 20

■ **JOINT RESEARCH CENTRE**

Information regarding the publications of the JRC can be obtained from:

• **CONTACT:** Joint Research Centre, Public Relations Office, Ispra, Italy
✆ Tel: +39 332 78 91 80
✆ Fax: +352 4301 320 84

Journals

Unless otherwise stated, all journals are available through the RTD Help Desk:

■ **INNOVATION AND TECHNOLOGY TRANSFER**

Published in English 6 times a year, covering EC actions relevant to innovation and technology transfer.

■ **RTD INFO**

Published 6 times/year in English. Covers in brief all work carried out under the Framework programmes, including calls for proposals, conferences, publications and so on.

• **CONTACT:** ✆ Fax +32 2 295 8220

■ **CORDIS FOCUS**

A fortnightly newsletter in English, containing items extracted from the CORDIS RTD-News database. Provides the latest news on all aspects of EC RTD activities.

■ **PROGRESS IN COAL, STEEL AND RELATED SOCIAL RESEARCH**

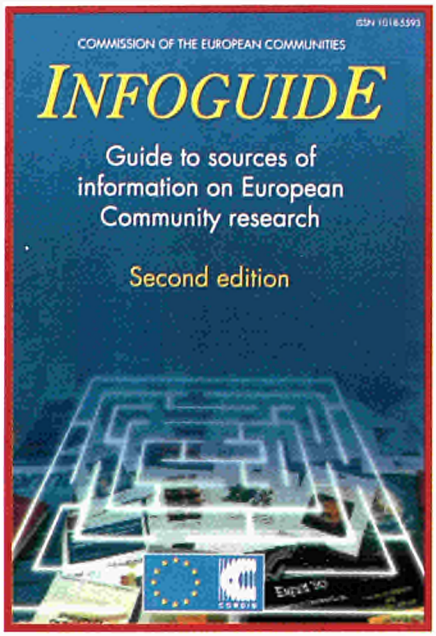
Published quarterly in English, covering all activities and publications in these areas (single copy: 12 ECU; yearly subscription: 45 ECU).

■ **EURO ABSTRACTS**

Published every month (single copy: 5 ECU; yearly subscription: 60 ECU), this is a printed version of the CORDIS database RTD-Publications, and gives abstracts of all RTD-oriented publications from the EC (100-200 a month). It also includes at least one major 'feature article' each month on the policies, activities and results of EC and other RTD programmes.

■ **ANNUAL AND SECTORAL CATALOGUES**

- 'Research Publications' is a yearly catalogue of the EC's publications in RTD, listed by subject and with title and author indexes.
- Sectoral Catalogues (20-30 pages) are available, giving details of all recent publications in specific research sectors.



RTD HELP DESK

The RTD Help Desk can answer queries on the EC's research programmes and supply details of contact persons and their telephone/fax numbers.

• CONTACT:
RTD Help Desk, European Commission, DG XIII/D-2, Luxembourg
✆ **Tel: +352 4301 33161**
✆ **Fax: +352 4301 32084**

VALUE Relay Centres

The VALUE relay service is a dedicated network of proactive advisory centres bringing the Community research and technological development activities (R&TD) closer to its clients (see Dossier article on VALUE, issue 1/94).

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Department Coordinatie, Administratie voor de Programmatie van het Wetenschapsbeleid (Flemish Region)
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B-5100 NAMUR
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Fax +49-7111231322;

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Tel. +49-3328435173;
Fax +49-3328435216;

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Fax +44-443 841 393.

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▷ PUBLICATION SOURCES

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N-0602 Oslo 6
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(cont. from page 10)

Case study: VRC Profile

Flemish VRC: Forging Industrial Links

The VALUE Relay Centres may only have been established in the past year, but the actual host institutions are often much older and experienced in technology transfer. In Flanders (Flemish-speaking Belgium), for example, the VRC is reinforcing and supplementing the work already started by other organisations.

IWT (Flemish Institute for the Promotion of Scientific and Technical Research in Industry), is a part of the Flemish VALUE Relay Centre. For 'downstream' work, they work extensively with the Research Centre of the Belgian Metalworking Industry (WTCM/CRIF), formed in 1949 by a trade association of companies in the metal, mechanical, electrical and electronics engineering and plastic processing industries.

In many ways, the WTCM/CRIF played the role of a VRC before 1993. Apart from its own research activities in BRITE/EURAM and ESPRIT projects, the WTCM/CRIF now works as an intermediary between the Relay Centre and over 1000 SMEs, assisting in partner searches and helping exploit the results of the EC's research Programmes. Their role in turning a Belgian RTD project into a BRITE/EURAM project is typical.

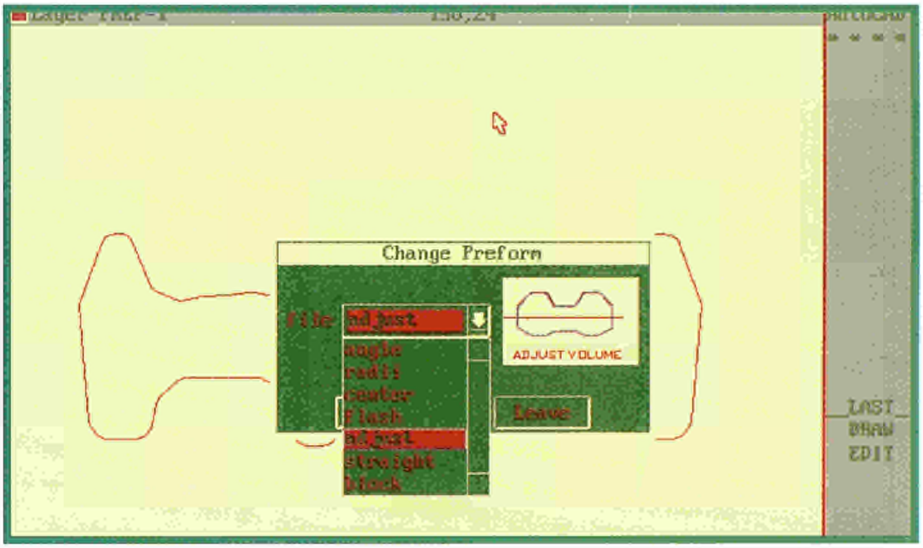

Illustration: WTCM/CRIF

In BRITE project P2210, Belgian and German research institutes worked with small and large companies to develop Computer-Aided Design systems for hot forging processes.

Internationalising R&D

The project concerns Computer-Aided Design (CAD) systems for hot forging processes. Hot forging has seen many innovations appear in the past few years, including the forging of products directly into the required shape. Companies have been forced to invest in new technologies, particularly CAD systems.

Such technology is difficult for many SMEs to adopt successfully, particularly when normal packages are unsuitable. In Belgium, where most of the forging companies are SMEs, none of the smaller SMEs used CAD systems, as available low-cost systems did not have the tools they needed. The larger SMEs did use CAD systems but, due to increasing international competition, these had to be improved in terms of speed, quality and cost.

To pool resources the companies formed an association and asked the WTCM/CRIF to set up a research programme. In Germany, meanwhile, a similar group of companies had formed their own research programme. Through the WTCM/CRIF's international contacts, the best ideas from both projects were combined into a new BRITE project (P2210), launched in January 1989.

Transferring Knowledge from Institute to Industry

The 4-year project aimed to develop a CAD system which could be adapted to suit different needs. The key to its success was the extensive contact between the researchers and their industrial partners.

Every 6 months the research institutes from both countries presented progress reports to the industrial partners, allowing them the chance to redirect the research. Purely national meetings were held at more regular intervals. In Belgium, a researcher stayed in one company for a week to better understand the practical problems of forging.

A typical industry-led change to the project involved making some of the developments, originally planned to be run only on workstations, available on PCs for the smaller Belgian companies. Some research was redirected into basic tools, while other tasks were dropped or 'filled in' by commercial software.

At the international level there was a constant flow of ideas, software and testing between the institutes and companies, resulting in German software with Belgian developments and vice-versa. The software has been distributed to all partners, with the German software, written for expensive, specialised CAD systems, being made available at the WTCM/CRIF for the Belgian SMEs. In addition, several new projects, within both the EC's Industrial Technologies and Advanced Materials Programme and EUREKA, are envisaged.

This project illustrates the importance of accounting for the practical needs of companies from the very beginning. It began before the Relay Centres were established, but the VRC has already provided a channel for wider distribution of the results, and, together with the other 26 VRCs, is reinforcing the international contacts between institutes and companies throughout Europe, making such projects even more likely to succeed.

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INNOVATION SURVEY

Better Data for Better Policies

SPRINT IN BRIEF

SPRINT (Strategic Programme for Innovation and Technology Transfer) is an EC Programme designed to improve Europe's ability to innovate and transfer technology, both between business sectors and between Europe's different regions. It is an innovative and experimental programme composed of a number of actions and initiatives, and will be covered extensively in next issue's Dossier.

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Science, technology and innovation are areas in which policy-makers have an urgent need for better information. The Community Innovation Survey (CIS) is a first step in building up comparable statistical data on Innovation in the EC at the company level, and will help improve the European environment for technology transfer

It has become clear that those nations that excel at creating new knowledge and transforming it into new technologies and products will prosper in years to come. The increased policy attention being paid to processes of technological innovation and diffusion by companies, however, has revealed limitations in the data available to analyse these processes.

The Community Innovation Survey (CIS) therefore aims to put technological change and innovation on a statistical footing equivalent to other key areas of economic policy. It is a joint action by the European Innovation Monitoring System (part of the EIMS' 'Innovation and the Firm' subprogramme, see Box) and Eurostat.

The database will cover at least 25,000, and possibly up to 50,000 firms, based on a common questionnaire adopted in all Member States. A similar survey will also be performed in the United States and Japan, making comparisons possible.

The CIS covers a wide range of questions and indicators of general innovation activity. The aim of CIS is to provide analysable data on:

- primary characteristics and objectives of, and obstacles to, innovation activity at company level
- innovation outputs, in the form of data on introduction of new products, and their contributions to the turnover and exports of firms
- data relevant to company performance, such as levels and growth of output, export and employment

Thus, the CIS project is itself an innovative one. Firstly, the data are new. Secondly, it will not only give policy makers a view of what is happening at the sectoral level, but also give them a precise and detailed picture of innovative activities inside European companies. Lastly, its scope, coverage and international dimension will make the project a genuinely unique policy resource.

Aiding Policy Analysis

CIS will permit a number of unique and different studies to be undertaken with relevance to formulating policy. A few examples include:

- Key policy issues seem likely to depend in the future on a better understanding of innovation complexity and variation. The existence of micro-level innovation data is a major resource in exploring this issue.
- There is evidence that innovation outputs are shaped by the proportion of basic research which firms undertake. Using CIS data, the composition of R&D can be related to innovation performance at the company level.
- The importance of networking is widely acknowledged. It should be possible to use this data to analyse the innovation performance of networking versus non-networking firms.

CIS is potentially a major breakthrough in data collection and comparative analysis of innovative activities. The data collection phase will be completed for most Member States by the end of '93 or in early '94.

The analytical phase has already started by launching different studies. These will be integrated into a first descriptive report, to be titled 'Innovation and Technology Transfer in Europe', and published in November 1994.

THE EUROPEAN INNOVATION MONITORING SYSTEM

The EIMS is a set of programmes aimed at providing policy makers with information, analysis and research on the factors shaping, promoting and inhibiting innovation at company level across Europe.

In seeking to fulfil these objectives, the aims of the EIMS are:

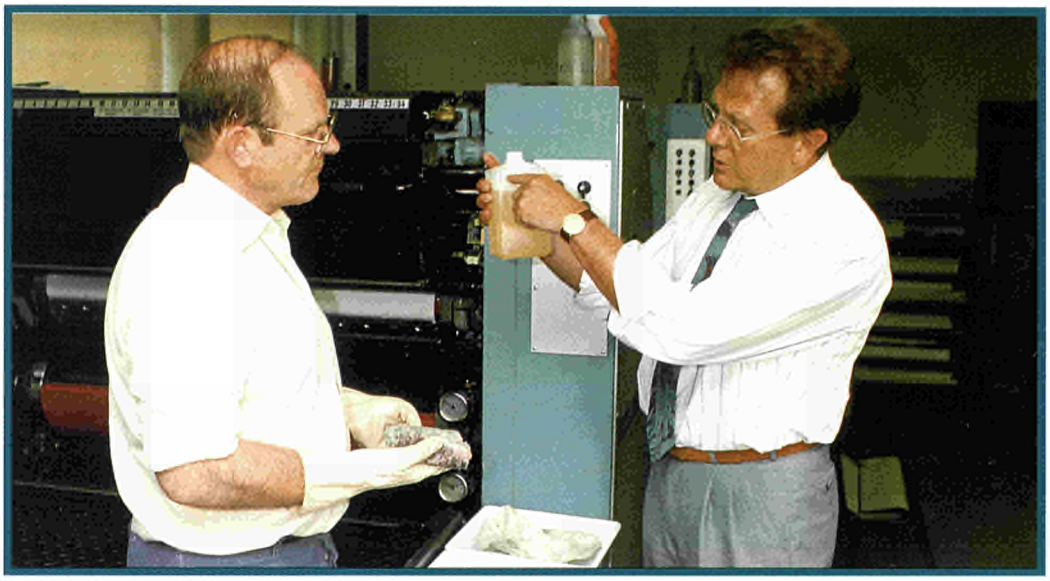
- to develop and assist the implementation of a permanent Community-wide data collecting system for monitoring the innovation capabilities and performance of industries and regions - **the EIMS observatory**
- to establish a systematic diffusion of the results of relevant studies and surveys performed in the Member States by the Commission, and outside the Community - **the EIMS clearing house**
- develop and link centres of excellence performing applied innovation research and surveys **at the Europeanlevel - the EIMS network**

The research and analytical activities of EIMS are divided into four main components or subprogrammes:

- Innovation and the firm
- Innovation infrastructures and support services
- Innovation policy
- Evaluation activities

Possible 1994 Extension for Current Projects

The Specific Projects action line was launched in 1989 as a major activity of the SPRINT programme. There have been two calls for proposals, in 1989 and in 1990, resulting in 22 specific projects in the main implementation phase. In 1994, some may be extended.



SP231: Non-toxic vegetable oils for cleaning printing machines have been developed and are being transferred from north to west and south Europe

All the projects are concerned with quite large scale, industrially relevant technology transfer, involving a wide partner mix (end users, technology providers and intermediaries). Due to the intensive selection processes, a new call for proposals for specific projects will not be possible during 1994.

However, certain successful running projects may be considered for extension, particularly if the proposals involve new partners, additional countries and increased diffusion. Already during 1993, three projects have been given additional support to extend their activities to further users:

- SP231 is concerned with improving the conditions of people working in the printing industry through replacing solvent-based products with vegetal cleaning agents. It has extended its activities to include training seminars in Italy, the UK, The Netherlands and Luxembourg.
- SP257 focuses on leakage control in fresh water supply systems, and is extending to include partners in Germany.
- SP034, concerned with the high speed spinning of wool, is extending its diffusion activities to Ireland, the UK and Belgium.
- SP226, working on the transfer of real-time control systems into urban drainage systems, is extending to include pilot implementations in Lake Garda (Italy) and Berlin (Germany).

Existing projects and national authorities are currently identifying new potential partners for selected successful projects, and it is hoped that during 1994 further extensions will be supported.

SPRINT is looking not only to increase the impact and geographical spread of current projects but also to identify the practices and methods used by project partners to overcome the many barriers still existing to technology transfer. SPRINT will therefore also be supporting a number of subordinate accompanying measures, in which existing project partners can exchange experience on topics such as project management and best practice in innovation transfer. □

SP257: Close monitoring of predefined leakage control zones can detect leakages and, using instruments, identify their exact location

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▷ VALUE ANALYSIS

Better Management Through Value Analysis

Demonstrating the practical applicability of Value Analysis

Within the framework of the SPRINT programme, DG XIII has published 'Better Management Through Value Analysis'. It is the fifth publication in a series aimed at fostering knowledge and use of value analysis techniques, and presents case-studies covering a wide range of applications of the value analysis methodology.

Value analysis is a management tool which leads to innovation and increased productivity through the successful fusion of strategy, intellectual ability and imagination. It is aimed at a thorough improvement of profitability by completely rethinking the product or service. The only factor considered 'untouchable' is the product's final purpose - the users' real needs. The product with greatest 'value' therefore just meets the necessary functions required to satisfy user needs at minimum cost.

Value analysis strategy has six identifiable phases:

1. Preparation and orientation
2. Information collection
3. Functional analysis
4. Creativity
5. Evaluation
6. Implementation

In the case studies in the report, these phases are systematically highlighted. The report describes value analysis methodology as adopted by groups of people with different backgrounds, working in an informal atmosphere. The informal group approach is clearly central to the method and generates useful new ideas, along with a better team spirit.

The report shows that value analysis is a versatile tool relevant to a variety of companies, large or small, operating in high-tech or traditional sectors. Not only can it be used to improve design and production, but also to increase the performance of service and administrative activities.

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▷ SCIENCE PARKS

The RITTs Initiative: Regional Interactions

One of SPRINT's main objectives is to increase the efficiency and the coherence of existing policies and instruments at regional, national and Community level in the field of innovation and technology transfer.

Science Parks and similar initiatives, which are part of these processes, are a SPRINT priority, which is expressed through the Science Park Consultancy scheme. SPRINT is launching a new call for proposals within this framework.

The call includes two new strands, aside from the classic support for Technology Park feasibility studies. The first new strand is concerned with the evaluation of existing Science Parks, while the second is RITTs - the Regional Innovation and Technology Transfer audits initiative.

One aspect of RITTs is to analyse the interactions between the various organisations which deal with technology transfer aspects at the regional level and the regional fabric of SMEs. Another is to devise a strategy aiming at improving the efficiency of technology transfer organisations in terms of the services they actually deliver to firms.

The Commission will provide financial support* to local or regional governments and/or development organisations wishing to set up a transnational team of experts to review the design, impact and effectiveness of technology diffusion organisations at regional level. Strategies aimed at improving the innovation support infrastructure should also be developed.

Information packages for RITTs and Science Park Initiatives are now available.

** 50% of the eligible cost of the consultancy assignment, unless the region is classified as lagging in development or in regional decline, where the support rises to 75%. Maximum support is 120,000 ECU*

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▷ RESEARCH & TECHNOLOGY ORGANISATIONS

RTO Conference

The SPRINT programme organised a conference on 16-17 November 1993 on the future role of Research and Technology Organisations (RTOs) in Europe. This conference took place in the Palais des Congrès, Brussels, and brought together a total of 400 practitioners and policy makers. The event was structured around four core themes:

- Strategic issues facing RTOs
- Competition versus collaboration; the options facing RTOs
- Adapting the role of RTOs to the needs of SMEs
- Managerial issues facing RTOs in the immediate future.

The proceedings of the conference will be published in Spring 1994.

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▷ TELEMATICS

Europe-wide Telematics-based Training

The DELTA Programme's Telematics-Based Training Multiconference, held on 26-27 October last year, used telematics technology developed by DELTA projects to simultaneously connect up 500 experts in education and technology, gathered at six European sites, to discuss the future of flexible and distance learning.

Telematics, where computer and telecommunications are combined synergistically, promises to make a major impact in the field of 'learning at a distance' in the next decade, holding out the promise to improve Europe's training and education systems and encouraging integration across the continent.

Three main problems in telematics-based training - user requirements, pilot experiments, and standardisation and network management - dominated the debates at the Conference. Working under the general theme of "How can telecommunication networks and multi-media tools improve lifelong learning for the citizens of Europe?", participants in Athens, Berlin, Brussels, London, Madrid, and Montpellier explored the issues in a variety of panels, workshops and demonstrations.

The discussions on user requirements and pilot experiments focused on the technological issues in telematics, whilst standardisation and network management discussions centred on the content and set-up of educational programmes. The presentations ranged from "The contribution of DELTA projects in the development of telematics in Flexible and Distance Learning" (Berlin) to "Experimentation Management" (Montpellier).

The DELTA Programme's Multiconference: The technology used to bring 500 people, gathered at six European sites, together to discuss the future of flexible and distance learning was itself developed by a DELTA project

Photo: SNE J. Alais

Key conclusions included a call for the maximum liberalisation and tariff reduction in telecom services (Athens); a consolidation of technologies between different regions, sectors and institutions (Madrid); pilot programmes to explore the development of useful media that favour accessibility, familiar technologies and a good cost/benefit ratio (Brussels); discussions of technical, teaching and strategic aspects of telematics-based training (Berlin); and a recognition of the need for the proper design and culture of the learning environment, and a scientific method to judge the effectiveness of these new designs (London).

Appropriately, the conference made use of Interactive Teleteaching (ITT), which was developed in the DELTA research project ACT (Advanced Communications for Training), and the Eutelsat satellite to provide a video educational forum. □

DELTA

Development of European Learning through Technological Advance (1988-1990)
Continued into the Third Framework Programme as:
Telematics Systems Specific Programme: Area 4 - Flexible and Distance Learning.
Participants: Around 180 organisations (nearly half SMEs).
R&D Budget: 55.9 million ECU.

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▷ INFORMATION SERVICES

An Active IMPACT

With the ever-increasing power of desktop computers, the 'information services' market is booming, as recent mergers between telecommunication, entertainment and publishing companies in the USA demonstrate. In Europe, many firms are developing these technologies within the IMPACT II Programme, which is establishing a 'single market in information services'.

IMPACT aims to stimulate and reinforce the competitiveness of European suppliers of information services, promote the use of advanced information services, reinforce Europe-wide cooperation in this field and make use of the results of other Community and national programmes. To this end, IMPACT supports a number of strategic information initiatives.

A good example is multimedia, where systems are being developed to handle and display every conceivable sort of information: text, pictures, sound and full-motion video and film. Multimedia, particularly combined with tomorrow's powerful telecommunication networks, could revolutionise the way people receive, ●●●

search for and assimilate information, from news to education and entertainment.

22 Multimedia Prototypes

In 1992, IMPACT issued a Call for Proposal, resulting in a number of multimedia projects which recently reached the prototype stage. On November 22 last year, the Commission chose 22 of these projects for further support. The majority of these new titles, which should be ready by this autumn, will appear in the CD-ROM or CD-I (compact disc-interactive) formats, and will aim largely at the mass market.

Between them, they will demonstrate the enormous flexibility of the multimedia format, with subjects ranging from baby care to Flemish art. Some will feature full-motion and full-screen video, while others will include quizzes and games to make learning more enjoyable.

As is typical with multimedia, the companies involved in these projects come from a variety of fields, ranging from traditional publishing to hi-tech electronics. If this first range of projects is successful, they will represent another step towards a globally competitive European multimedia industry.

Electronic Publishing at the Frankfurt Book Fair

Four of these prototypes were demonstrated as part of the significant IMPACT presence at the 1993 Frankfurt Book Fair, held last October:

- OPERATION GOLD: an audio-visual database of post-war German history, combined with an interactive spy game involving chases around Berlin.
- HYPP (Hypermedia for Plant Protection): information on weeds, plant diseases and pests in 6 languages on CD-ROM
- HAZARD: An interactive, CD-ROM-based database providing training, information and instruction on 'Managing Health and Safety at Work'
- EDUSEX: Frank and accurate information on facts and experiences important to a healthy sex life.

The Fair (with the theme 'Frankfurt Goes Electronic', indicating where most publishers see their industry heading) attracted over a quarter of a million people, and also featured an IMPACT Information Day and a series of pre-arranged meetings between industrialists and scientists, brought together through the IMPACT programme.

IMPACT also organised a major conference, bringing 280 people together from various European publishing houses and related industries. On the agenda was a Commission study on identifying and creating a European market for electronic publishing. The main recommendations of the study are for publishers to:

- get on the learning curve early
- get involved in strategic alliances
- follow a low-risk path from purely printed to combined printed and electronic information services

The general message of the conference was that, while industry must be the driving force behind this revolution, the Commission should help create the right conditions, focusing on actions with broad industrial support, substantial impact and tangible results. Industrial representatives, welcoming the chance to contribute to defining the EC's activities, called for level playing fields for network access, workable solutions to copyright protection and improved standards.

New Call for Proposal

In spring or summer this year the EC will launch a Call for Proposals for projects to stimulate the development of pan-European information services. These services, such as on-line databases, videotex and audiotex, as well as off-line services such as CD-ROM, diskette and fax, should all be accessible from one point. The Call for Declarations of Intent closed in the middle of January, but interested companies can still contact the IMPACT Central Office to be put on the mailing list for the Call for Proposals.

In addition, the proposed Fourth Framework Programme (see pages 3-5) includes an 'Information Engineering' Initiative to help the European publishing industry carry out the necessary R&D to make the 'scribe-to-screen' transition. The Initiative aims to improve the usability of information for the consumer, which means developing better methods and tools for creating information products, better databases for distributing information and systems for finding, retrieving and exploiting information.

The 'Hazard' multimedia package, developed by British and German companies with the support of the IMPACT programme, was shown at the Frankfurt Book Fair last October

On-Line Information

More information on IMPACT can be obtained, appropriately, from two on-line databases, recently added to ECHO (European Commission Host Organisation). The databases are:

- IMPACT INFORMATION SERVICE: a brief introduction to IMPACT; recent news; contact points; documentation; document list and ordering service; and an electronic mailbox facility, where users enter messages or questions to be answered by IMPACT Central Office
- INFORMATION MARKET FORUM (I'M FORUM): Currently holds data on over 600 companies and individuals offering consultancy and/or services in the information market, categorised using over 80 fields (from artificial intelligence to videodisk). An excellent information source for companies needing information, advice, or even a partner for an EC research project.

Both databases are free of charge. For further information, contact the Central Support Team, ECHO (see the Quick Reference Guide, centre pages)

IMPACT II

Information Market Policy ACTions
Timescale: 1991-1995.
Budget: 64 MECU.
Aims to establish a single market in information services.

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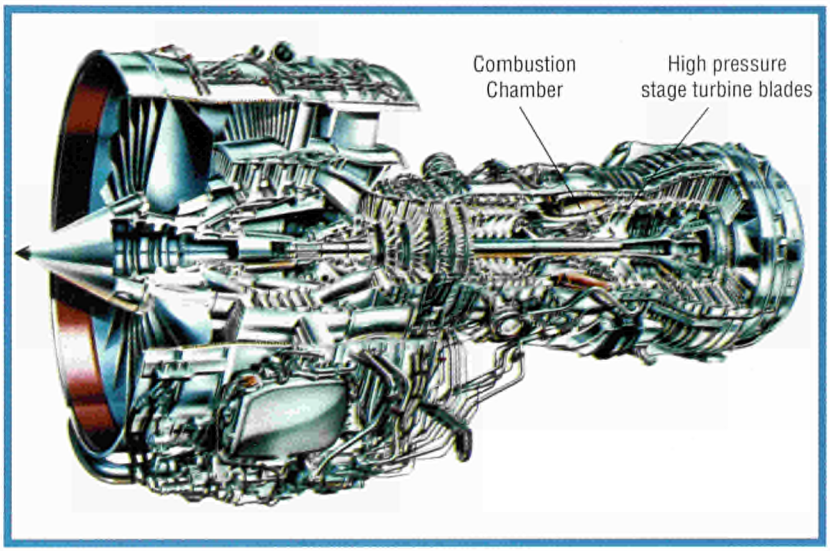
Electronic Image: 3V Multimedia, Germany

▷ CASE STUDY

Advanced Testing for Advanced Materials

In a model of how European industries can exploit the expertise of the Joint Research Centre (JRC), the UK's Rolls-Royce and Germany's Motoren und Turbinen Union have joined forces through the Third Framework Programme, using the JRC's Institute for Advanced Materials (IAM) as a subcontracting laboratory.



Turbine blades and a driveshaft transfer energy produced in the combustion chamber forward to compress incoming air

Illustration: JRC Institute for Advanced Materials

The international recession and defence cutbacks have significantly intensified international competition in aeroengine manufacturing, which is divided between a small number of European and American firms. To remain competitive, Rolls-Royce is focusing on making engines as fuel-efficient and as cheap to maintain as possible. Motoren und Turbinen Union GmbH (MTU), which is Rolls-Royce's major partner on the upcoming Eurofighter's engines, faces similar challenges. Both see using advanced materials as essential to their future as hi-tech manufacturers.

Turbine Blades: Critical Components

In an aircraft engine, fuel and compressed air explode inside combustion chambers at high-temperature and pressure. The resulting gases are ejected out the back, propelling the aircraft forward. However, as they leave the combustion chamber they also drive a set of turbine blades, which transfer energy to the front of the engine to compress incoming air.

The mechanical load, or stress, on these turbine blades varies enormously, and these stresses occur over a wide range of temperatures, with blade surface temperatures approaching to within a few hundred degrees of the material's melting point. Due to their extreme operating conditions, their importance to safety and the inexact understanding of their lifetime, the blades are regularly checked and replaced when any structural faults, such as microcracks, are detected.

Engine efficiency is proportional to the temperature inside the combustion chamber, so improving engine efficiency requires turbine blades which can withstand higher temperatures and whose lifetime is more exactly understood, reducing the need for maintenance checks. Blades must also be as light as possible, to keep engine weight to a minimum.

Industry Link-Up Through JRC

According to British materials scientist Andy Bennett, "Rolls-Royce had worked on isothermally testing potential turbine blade materials, where samples were stress-tested at one temperature. However we needed a thermo-mechanical fatigue, or TMF, testing laboratory, which would put the materials under similar conditions to those found in the engine itself. We decided to subcontract to an existing laboratory, and the IAM was the obvious choice - their resources, both human and technical, make them the best in Europe."

The IAM knew that MTU were also interested in this field, and put the companies in touch with one another. Together with Spanish modelling institute Centro de Estudios e Investigaciones Tecnicas de Guipuzcoa (CEIT), they formed a project under the EC's Industrial Technologies and Advanced Materials Programme (BRITE/EURAM II), with the IAM as a subcontracting laboratory. Project BREU-0338, as it became, was launched in 1991 for four years, with Rolls-Royce as the prime partner.

Thermo-Mechanical Testing

A turbine blade consists of two main components: a metal core, or substrate, and a coating. The substrate is a single crystal of a 'super alloy', while the coatings are composed of one or more elements which are easily oxidised, forming a protective oxide layer.

The IAM test equipment simulates the behaviour of the blade under its operational conditions in the laboratory, and observes the growth of any cracks. The sample is heated by electromagnetic induction, while the strain is produced by a hydraulic piston and measured with an extensometer. A load cell measures the stress applied by the piston.

In this way the researchers can measure the substrate-coating combination's actual stress-strain-temperature relationship, which is crucial to predicting the blade's lifetime.

According to IAM project scientist Dr. Johan Bressers, one of the most important and unique features of the system is that it investigates non-intrusively. ●●●

"We have developed a computer vision system, composed of an optical microscope coupled to a video camera, which monitors the sample for micro-crack initiation and growth," he explains. "This system captures, digitises and displays images of the sample in real-time, and can either scan the entire surface or concentrate on a particular region with a magnification of up to 1000 times."

This enables the operators, if they wish, to find cracks as they appear and focus in on them for more detailed analysis. Usually, however, the scanning pattern is programmed in advance, so the equipment needs no supervision.

This system compares well to the 'replica technique', which is traditionally used to monitor surface damage. The replica technique requires that the test be halted so that the surface of the sample can be replicated by means of an acetate film. This has to be done dozens of times for each test, a laborious, resource-intensive process which can also compromise the results.

After the test is completed the data is analysed to produce a crack growth history of the primary crack, the one which leads to total breakdown. At this stage the important data are when the cracks appeared, how fast they grew, and whether they joined together.

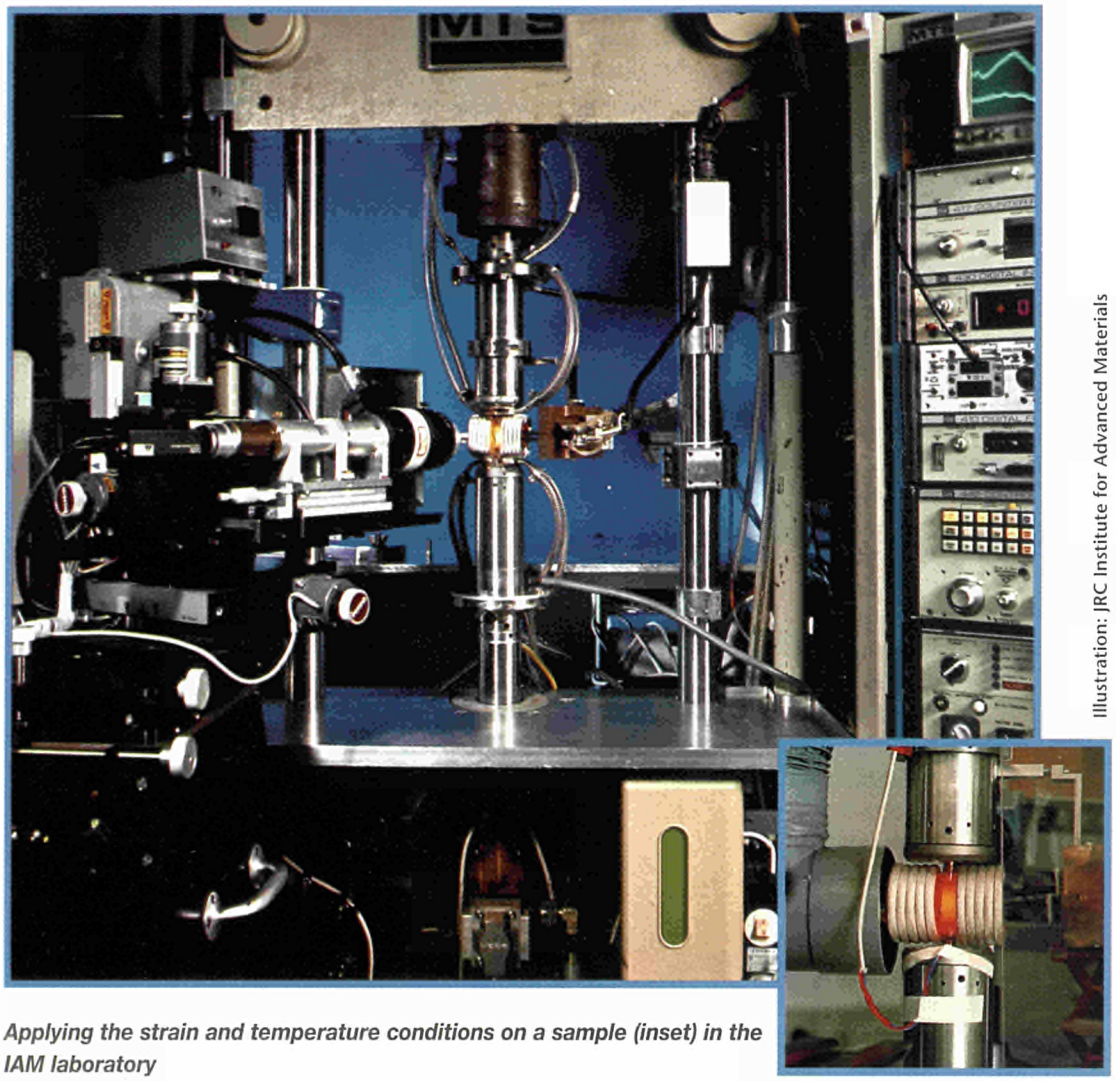


Illustration: JRC Institute for Advanced Materials

Applying the strain and temperature conditions on a sample (inset) in the IAM laboratory

The sample is also analysed using electron microscopy and a scanning electron microprobe, which also provides information on its micro-chemistry. This three-dimensional information on the crack helps to identify and analyse the mechanisms which affect crack growth, as well as the crucial question of why some cracks grow from the coating into the substrate and others do not.

Lifetime Prediction Model

Working together, Rolls-Royce and MTU identified two substrates and three coatings to be tested in this way. The IAM laboratory has already performed 55 of the 80 tests, and has also finished a literature survey of over 30 different models, selecting one for further development.

"The test data will form an invaluable database, giving us a feel for how changes in operating conditions, coating materials and other parameters affect blade performance," explains Mr. Bennett. "It will, for the first time, give us an understanding behind the data. CEIT's work has also been important. Previous models were very material-specific, but CEIT has focused attention on which phenomena and parameters are the most important. This should eventually lead to a general model which can be applied to a wider range of materials, because we will be working from a better understanding of the material mechanics."

The final goal is a lifetime prediction model, enabling the industrial partners to select better materials for new engines, although neither MTU nor Rolls-Royce expect the project to result in an 'off-the-shelf' product. "By giving us a good picture of the behaviour of these materials under these conditions, the project will make the first step towards a more general model," stresses MTU scientist Dr. Affeldt. "Our company laboratory will continue the work for our specific needs."

Rolls-Royce has similar plans, and may continue its collaboration with the IAM. "We found the IAM very focused to our engineering needs." Andy Bennett adds, "so in the future we may enter into a private arrangement where the IAM tests our more confidential materials, those closer to the edge of development."

The IAM has also launched several sub-projects within their own research programme to provide, as Dr. Bressers explains, "a better basis for the mechanistic understanding and the mechanism-informed modelling of blade lifetimes. These projects will help us prepare for contracts for manufacturers of land-based turbines, such as in power plants, as there's no reason why we cannot serve these industries as well."

THE JRC IN BRIEF

The Joint Research Centre is a European scientific and technical research centre established by the EC. The four research sites in Belgium, Germany, Italy and the Netherlands house eight Institutes:

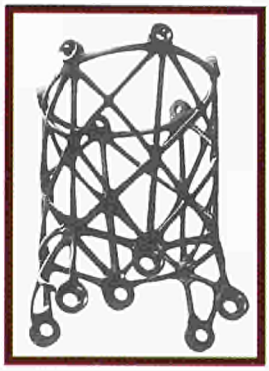
The Central Bureau for Nuclear Measurements, The Institutes for Transuranium Elements, Advanced Materials, Systems Engineering and Informatics, Safety Technology, Remote Sensing Applications and Prospective Technological Studies, and the Environment Institute.

For further information, see the Quick Reference Guide (centre pages)

▷ C O N F E R E N C E S

ADVANCED MATERIALS FOR LIGHTWEIGHT STRUCTURES

22-25 March 1994, Noordwijk (The Netherlands)



The International Symposium on Advanced Materials for Lightweight Structures will examine the design, manufacturing processes and integrity of lightweight structures. Presented by the European Space Agency (ESA) in conjunction with BRITE/EURAM, EUREKA and SAMPE.

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VALUE AT ENVIRONMENTAL TECHNOLOGY 1994

22-24 March 1994, Birmingham (UK)

As part of VALUE's activities in helping the results of EC-supported RTD reach the market (see Dossier article, page 6), a VALUE stand will present around 10 projects at 'ET 94', now the largest exhibition of environmental technology in the UK.

300 exhibitors and 10,000 visitors are expected to attend the exhibition, which will cover everything from air and water pollution control to software and information services.

Contact: Sara Binns, Reed Exhibition Companies, UK
Tel: +44 81 948 9800 - **Fax:** +44 81 948 9989

EUROPEAN STANDARDS FOR ADVANCED CERAMICS

29-30 March 1994

Organised at the JRC's Institute for Advanced Materials laboratories in Petten (The Netherlands), the Second Round Table for this subject examines industrial requirements, and the future outlook for ceramic powders, composites, coatings and monolithic ceramics (see pages 21-22 for a JRC-IAM case study).

Contact: Mr. B. Seysener, JRC-IAM
Tel: +31 2246 5375 - **Fax:** +31 2246 35 44.

MANAGEMENT OF COLLABORATIVE EUROPEAN PROGRAMMES AND PROJECTS IN RESEARCH, EDUCATION AND TRAINING

10-13 April, 1994, Oxford (UK)

Designed to stimulate a wide-ranging and high-level exchange of European experience in managing international collaborative programmes and projects, the conference aims to bring together leading policy-makers, programme managers and project coordinators in all existing programmes from throughout Europe.

Contact: Manfred Horvat, Austrian Bureau for International Research and Technology Cooperation (BIT), Austria
Tel: +43 1 50 59 059 - **Fax:** +43 1 50 59 054

A REVIEW CONFERENCE OF TECHNOLOGY TRANSFER IN EUROPE

28-29 April 1994, Hanover (Germany)

Held to mark the 10th anniversary of TII - The European Association for the Transfer of Technology, Innovation and Industrial Information - and of the operational launch of the SPRINT Programme, this conference will immediately follow the Hanover Industrial Fair, giving participants the opportunity to attend both events.

It will focus on the assessment of technology transfer and related innovation support services in Europe during the last ten years; future developments in technology transfer to the year 2000; and networking opportunities for all SPRINT professionals and network partners.

Contact: Christopher Hull, TII, Luxembourg
Tel: +352 46 30 35 - **Fax:** +352 46 21 85

CONCERTED CLEAN COAL TECHNOLOGY DEVELOPMENT FOR SUSTAINABLE ALL-EUROPEAN DEVELOPMENT

25-27 May 1994, Moscow (Russia)

Including specialists from both Eastern Europe and the EC.
Contact: J. M. Bemtgen, JOULE Programme,
European Community, Brussels
Tel: +32 2 296 20 71 -
Fax: +32 2 296 42 88

IT AND THE TRANSFORMATION OF THE ENTERPRISE

6-8 June 1994, Brussels (Belgium)

This European Commission conference will explore the future direction of information technology R&D, examine the emergence of new markets for information-intensive products and services, and conclude with a round table of leading political and industrial leaders discussing the effect of IT on industrial policy and employment.

Contact: EITC 1994 Conference Secretariat, Brussels
Fax: +32 2 296 83 97.

▷ P U B L I C A T I O N S

• *DRIVE Reports on-demand*

Like many Specific Research programmes, the Dedicated Road Infrastructure for Vehicle Safety in Europe Programme (DRIVE) has resulted in hundreds of 'deliverables' - reports, software, prototypes, standards and more. To make these results more available, DRIVE has launched an 'on-demand' report publishing system.

The approximately 80 DRIVE projects, finished in 1991 as part of the Second Framework Programme, produced over 300 deliverables in the field of transport telematics. Many of these projects are now being validated, assessed and developed as part of the 1991-1994 Telematics Programme. The DRIVE Infrastructure Group estimated that the market for this technology will be 50 billion ECU by the year 2020, with the infrastructure costing another 10-15 billion ECU.

Today, all available reports from DRIVE are listed in a catalogue, and anyone interested can order them. Requests are sent to a private publishing company, which will produce and send the reports on demand. Developed in collaboration with VALUE, the new system should prove more cost-effective, waste less paper and indicate which projects generated the most interest. ●●●

●●● It is being examined for possible application for other programmes.
Contact: Mr. B. Stergiou, European Commission,
DG XIII/C-6, Brussels
fax: +32 2 296 2391
or ECOTEC Research and Consulting Ltd, Birmingham (UK)
Tel: +44 21 616 1010
Fax: +44 21 616 1099

• SPRINT

See 'SPRINT News', pages 16-18, for more on SPRINT.

■ 'An Integrated Approach to European Innovation and Technology Diffusion Policy: A Maastricht Memorandum'. Based on brainstorming meetings held by experts in Maastricht and Paris, this 104 page book investigates the issues of developing and maintaining an effective policy of technological transfer. Concepts and medium and long-term solutions are explored, as are the political policies needed for structural change. Policies for environmentally sustainable technologies are especially emphasised.

■ "Better Management Through Value Analysis'. ISBN 928264936 9. Described on page 18 of this issue.

Contact: SPRINT Technical Assistance Unit, Luxembourg
Tel: +352 46 55 88
Fax: +352 46 55 50

• CORDIS

See the Dossier article on VALUE (beginning on page 6) for an introduction to CORDIS, which has recently produced two new publications, based on information held in CORDIS databases:

■ "Catalogue of Research Projects in the Third Framework Programme'. Catalogue no. CD-NA-14937-EN-C. 40 ECU. Contains information on 1,800 projects, including the subject, start/end dates and lists of partners, plus details of the specific programmes.

■ "Directory of Research Partners': Catalogue no. CD-NA-14993-EN-C, 66 ECU. 420 pages containing information on 1400 companies - including many SMEs - and private sector research organisations interested in forming partnerships for research and research exploitation.

• MEDICINE AND HEALTH

Four final reports in book form and a lexicon on diskette are being released by the Fourth Medical and Health Research Programme.
The first four books:
Contact: IOS Press Oxford, UK,
Fax: +44 865 74 20 24
Amsterdam, The Netherlands,
Fax: +31 10 620 34 19

■ "Advances in Biomedical Engineering: Results of the 4th EC Medical and Health Research Programme'. ISBN: 90 5199 119 3

■ "Health Services Research: Results of the 4th EC Medical and Health Research Programme'. ISBN: 90 5199 136 3

■ "Advances in Medical Biology, vol 3: Results of the 4th Medical and Health Research Programme'. ISBN: 90 5199 146 0

■ "Epidemiology: Results of the 4th Medical and Health Research Programme'. ISBN: 90 5199 150 9

■ "Epilex', based on John Last's 'Dictionary of Epidimology' (Oxford University Press), an electronic multilanguage lexicon of epidimological terms on a 3.5 inch floppy disk.
Contact: Dr. M. Hallen,
Fax: +32 2 295 5365

■ **Sectoral Catalogue**
The 20 page Sectoral Catalogue on Medical and Health Research Publications is now available.
Contact: RTD Help Desk,
Luxembourg,
Fax: +352 4301 32084

• JOULE

■ HERMES: Harmonised Econometric Research for Modelling Economic Systems'. ISBN 0-4448-9760-7
Covers the HERMES system of models set up by the JOULE programme. Developed from a pan-European network of 12 institutes in each Member State, models show energy's role in production and economics.
Contact: Elsevier Science Publisher BV
Fax: +31 20 586 26 23

■ JOULE I Catalogue of Contracts, final version. EUR 15305
Contact: E. Van der Voort,
JOULE, DG XII/F-3, Brussels
Fax: +32 2 296 42 88.

• DELTA

People and Organisations in the DELTA Programme ('92-'95)
ISBN: 3-8229-9910-5
Published by and available from Tribune, the DELTA project in charge of dissemination of information.
It gives an overview of all the DELTA R&D projects, including 220 organisations, companies and contact persons, as well as useful addresses and explanations of various projects.
Contact: Mr. W. Cooberman
or Mr. Paul Held,
University of Erlangen, Germany
Tel: +49 9131 85 47 35
Fax: +49 9131 85 47 38

• CORRECTION

The photo on page 6 of issue 2/93 of Innovation and Technology Transfer (June 1993) illustrated research carried out in the Laboratório Nacional de Engenharia Civil (LNEC) in Lisbon (Portugal), not the Italian National Civil Engineering Laboratory as stated.

N O T E

If specific contact information for obtaining a publication is not supplied, refer to the 'Quick Reference Guide' (issue 1/94). Publications are free unless otherwise stated.