

D.E. Carlson



GRS Company Profile

Safety Aspects of HTR-Technology NRC visit to Germany

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Tasks, Objectives and Competence of GRS

Central technical and scientific expert organisation for nuclear safety and waste management in Germany

Task

Assess and improve the safety of technical facilities

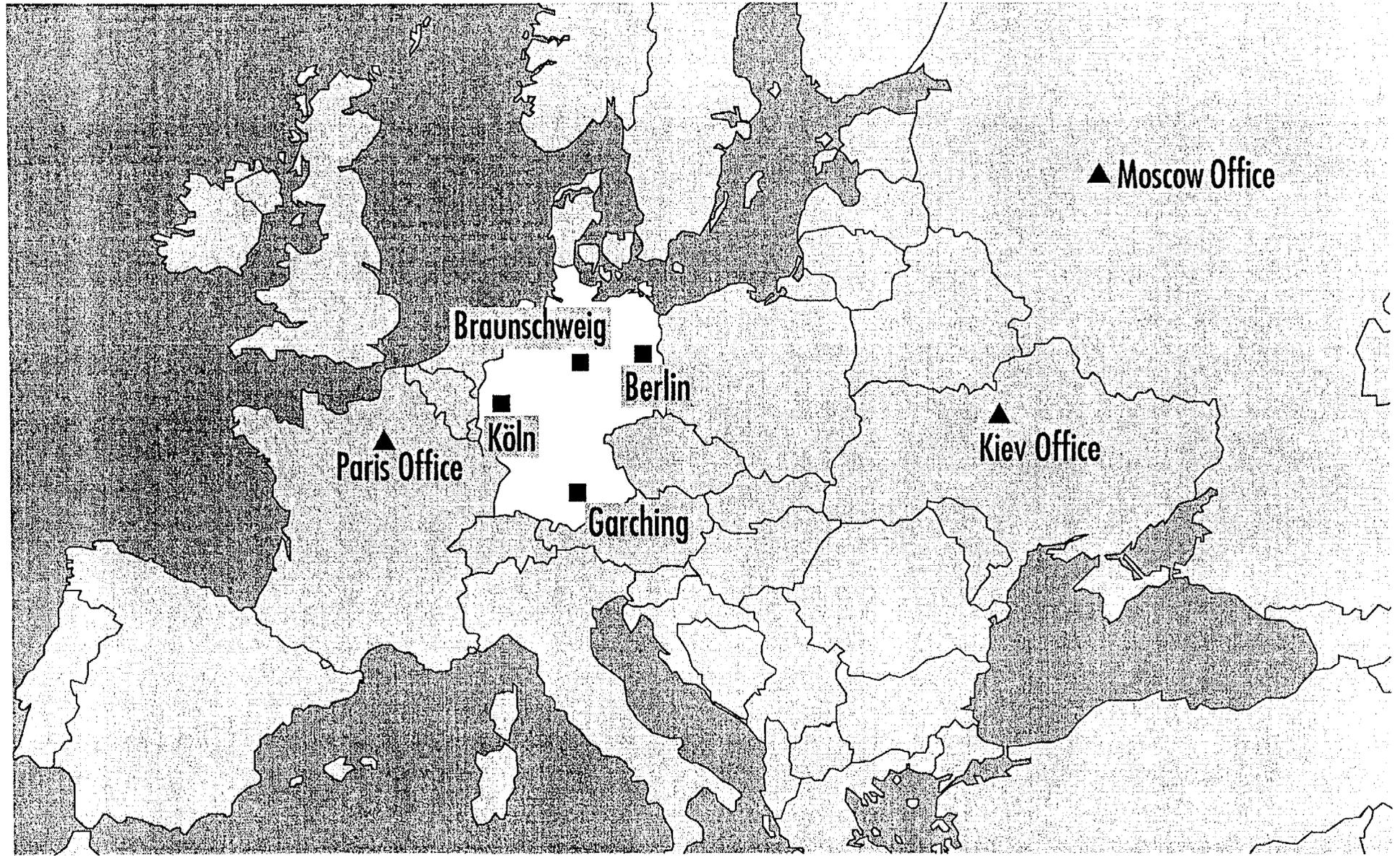
Objective

Protect man and the environment from the hazards of technology

Competence

- Interdisciplinary knowledge
- Advanced methods
- Qualified data

Company Locations and Technical Branch Offices



Governing Bodies of GRS

Shareholders' meeting

The shareholders are:

- the Federal Republic of Germany (46.1%)
- the Free State of Bavaria (3.85%)
- the *Land* of North Rhine-Westphalia (3.85%)
- the technical inspection agencies (TÜVs) and the Germanischer Lloyd (3.85 each, together 46.2%).

Supervisory board (12 members)

Chairman: Staatssekretär Rainer Baake

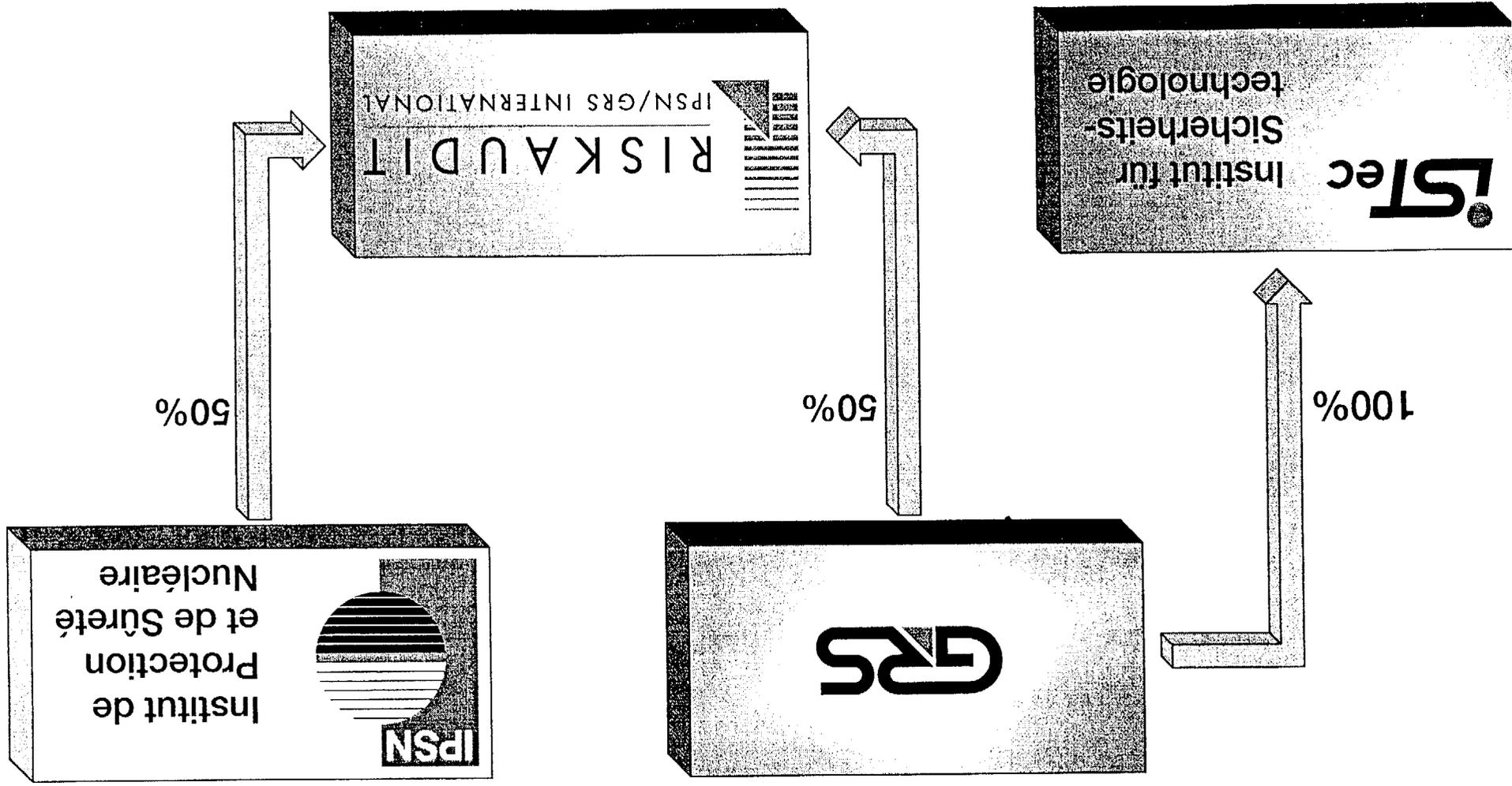
Vice-chairman: Prof. Dr.-Ing. Bruno O. Braun

Managing directors

Prof. Dr. Dr.-Ing. h.c. Adolf Birkhofer

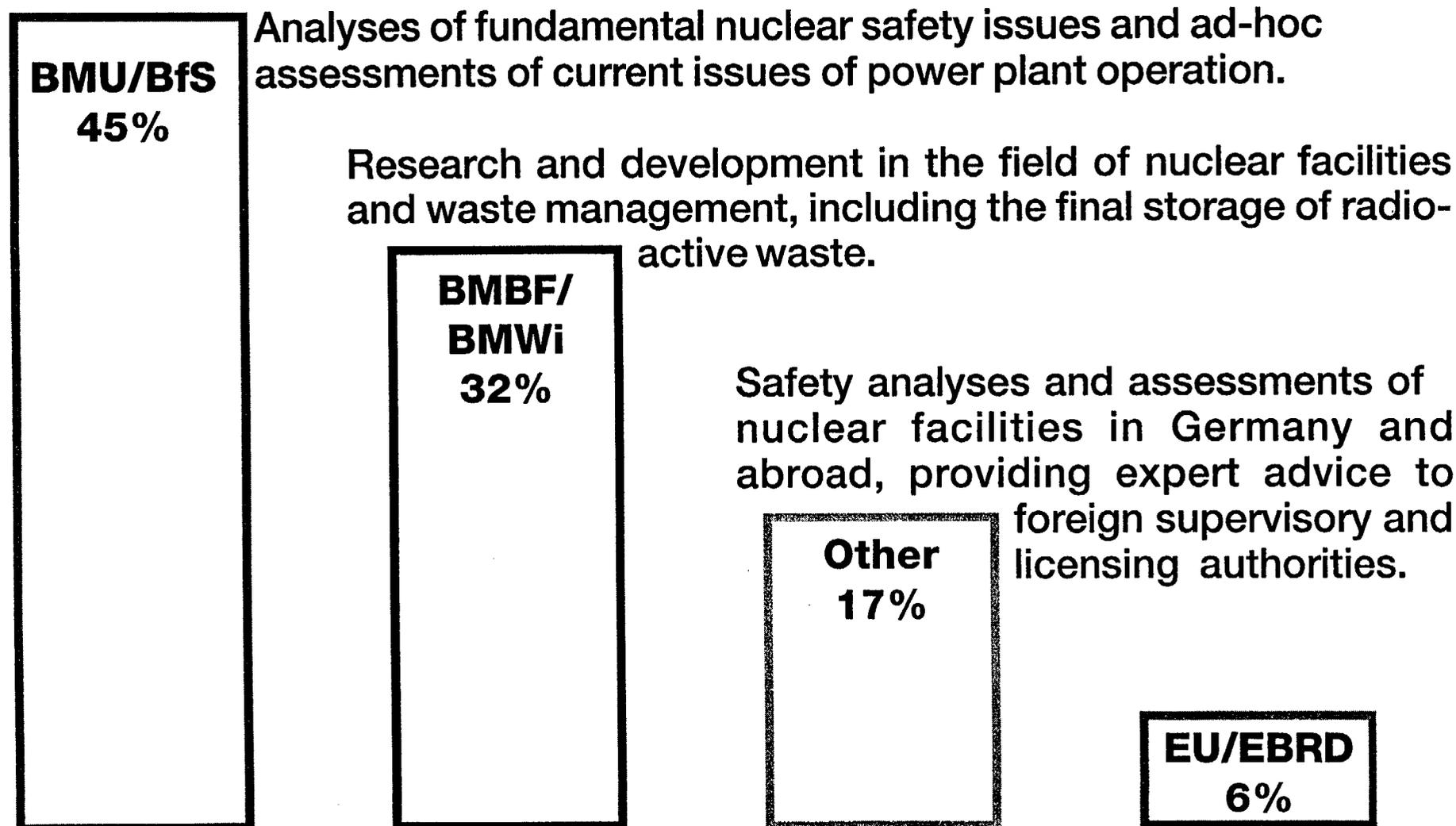
Dr. Walter Leder

Subsidiaries of GRS



Customers 1999

GRS is exclusively financed through contracts.

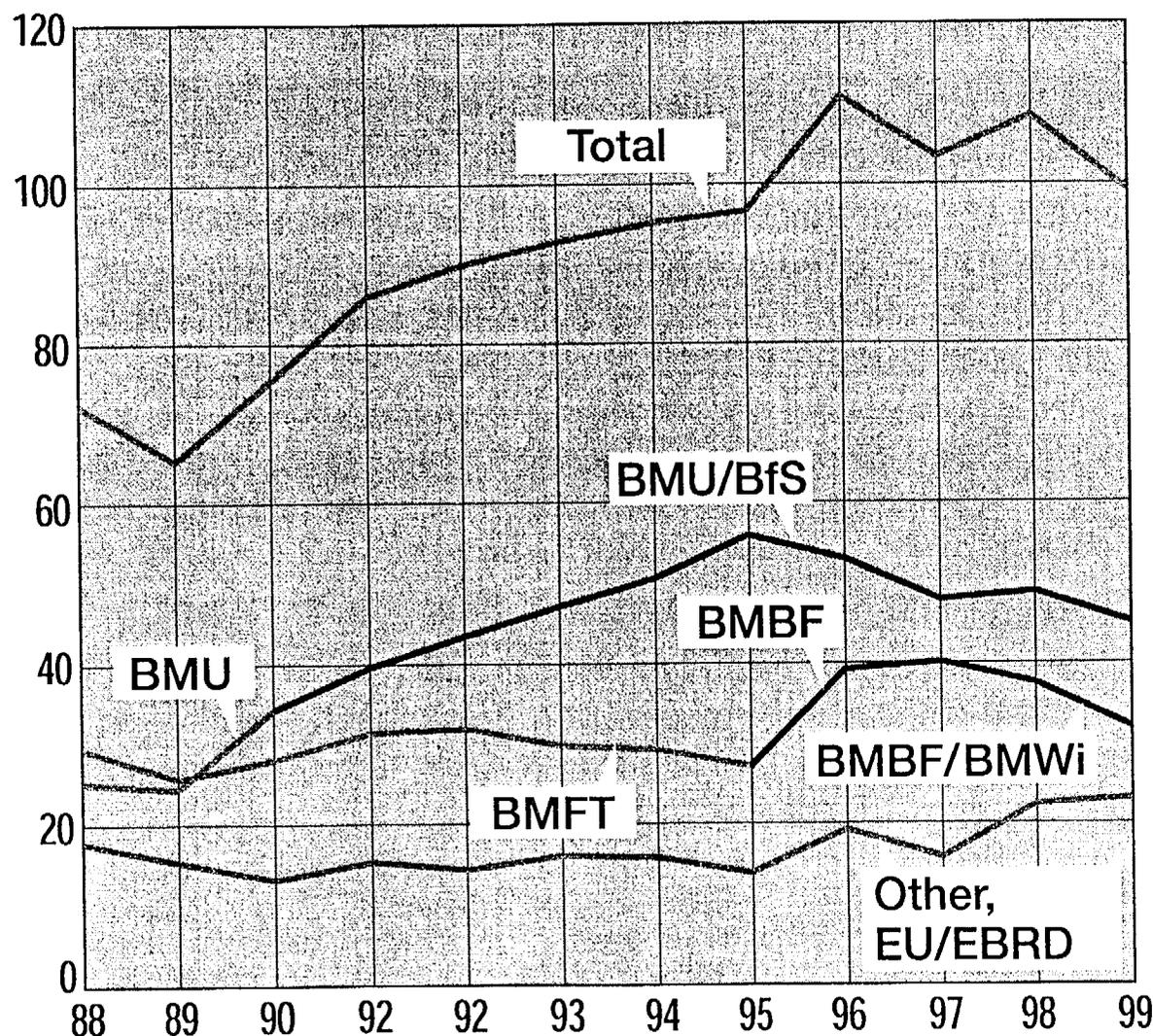


Volume of Contracts, Customers and Staff

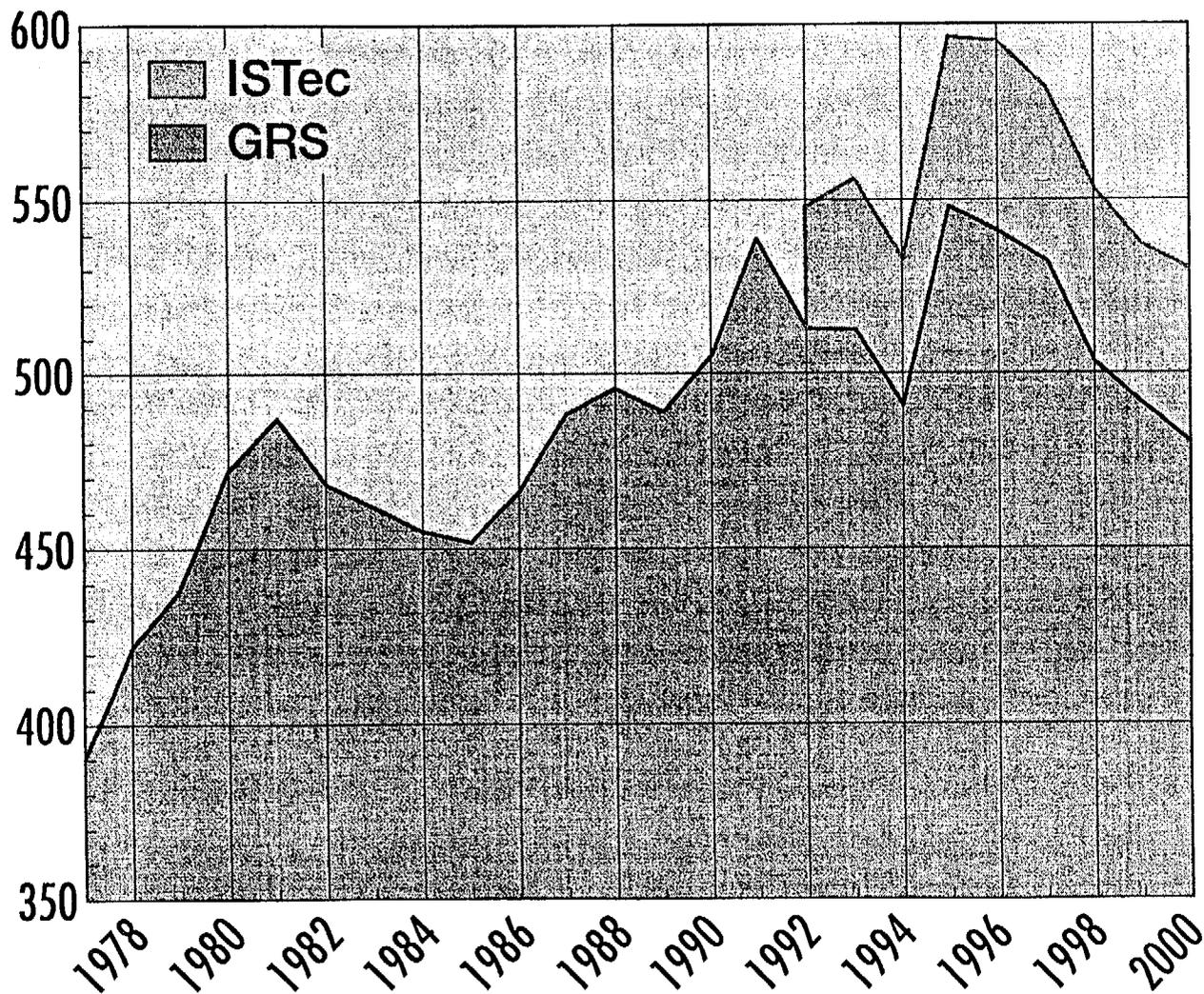
In 1999, contracts to the amount of approx. DM 99m were awarded to GRS for its scientific and technical work. This work was performed by more than 500 staff members, of

which about 350 are scientists and engineers of such disciplines as:

- mechanical engineering
- electrical engineering
- physics
- nuclear engineering
- process engineering
- safety engineering
- civil engineering
- chemistry
- geochemistry
- geophysics
- mathematics
- informatics
- biology
- jurisprudence
- meteorology



Number of Staff Over the Years



In 2000, GRS had more than 480 staff members, of which about 280 are scientists and engineers of such disciplines as:

- mechanical engineering
- electrical engineering
- physics
- nuclear engineering
- process engineering
- safety engineering
- civil engineering
- chemistry
- geochemistry
- geophysics
- mathematics
- informatics
- biology
- jurisprudence
- meteorology

Major Activities

Research and Development

- Development and verification of scientific software for the simulation of nuclear power plant behaviour under accident conditions**
- Development of advanced methods for probabilistic risk assessment**
- Development of simulators for investigations into the behaviour of complex technical systems and their man-machine interfaces**
- Methods for the early diagnosis of mechanical failures (e.g. vibration analysis, loose-part monitoring)**
- Development of methods for the assessment of the uncertainties of computer predictions**
- Methods to assure and assess the quality of safety-relevant software**
- Computer models for the performance assessment of final repositories**
- Experiments concerning geological and geo-technical influences final repository safety**
- Development of advanced safety concepts**
- Development of information and documentation systems**

Major Activities Analyses, Assessments and Expert Opinions

**Safety analyses and assessments of nuclear facilities
(e. g. nuclear power plants, waste repositories)**

Probabilistic risk analyses of complex technical systems

Analyses and assessments of transport safety

Safety analyses of facilities for the disposal of chemotoxic waste

**Analyses and assessments of specific technical safety issues
(e. g. incident control, reactor physics, material issues, fire protection,
safety of digital I&C, software reliability)**

**Analyses and assessments of nature conservation issues
(e.g. impact of mining-related radioactive contamination, restoration of contaminated
industrial sites, questions regarding occupational radiation exposure)**

**Monitoring and evaluation of national and international operating experience from
nuclear and other technical facilities
(e. g. common-mode effects, human factor analyses, precursor studies)**

Joint R&D Activities of GRS within the German Reactor Safety Research Programme

Universities

R&D contributions to resolve individual phenomena



GRS

Basic and application-oriented R&D as a basis for sound scientific-technical safety statements

- Development and supply of codes and methods for safety evaluations of incidents and accidents
- Integral view and evaluation of R&D results



MPA, BAM, IzfP

Basic and application-oriented R&D in the area of component safety and material testing



Research Centres

Basic and developmental research for particular subjects, e.g.
 FZK: Severe Accidents
 FZJ: Passive Safety Systems
 FZR: Reactor Dynamics



Industry

Development and operation-oriented research for design and optimisation of components and systems of reactor plants

GRS and its Partners in Western Europe

United Kingdom

UK Atomic Energy Authority (AEA Technology)

Netherlands

Kernfysischer Dienst (KFD)

Belgium

AIB-Vincotte Nuclear (AVN)

France

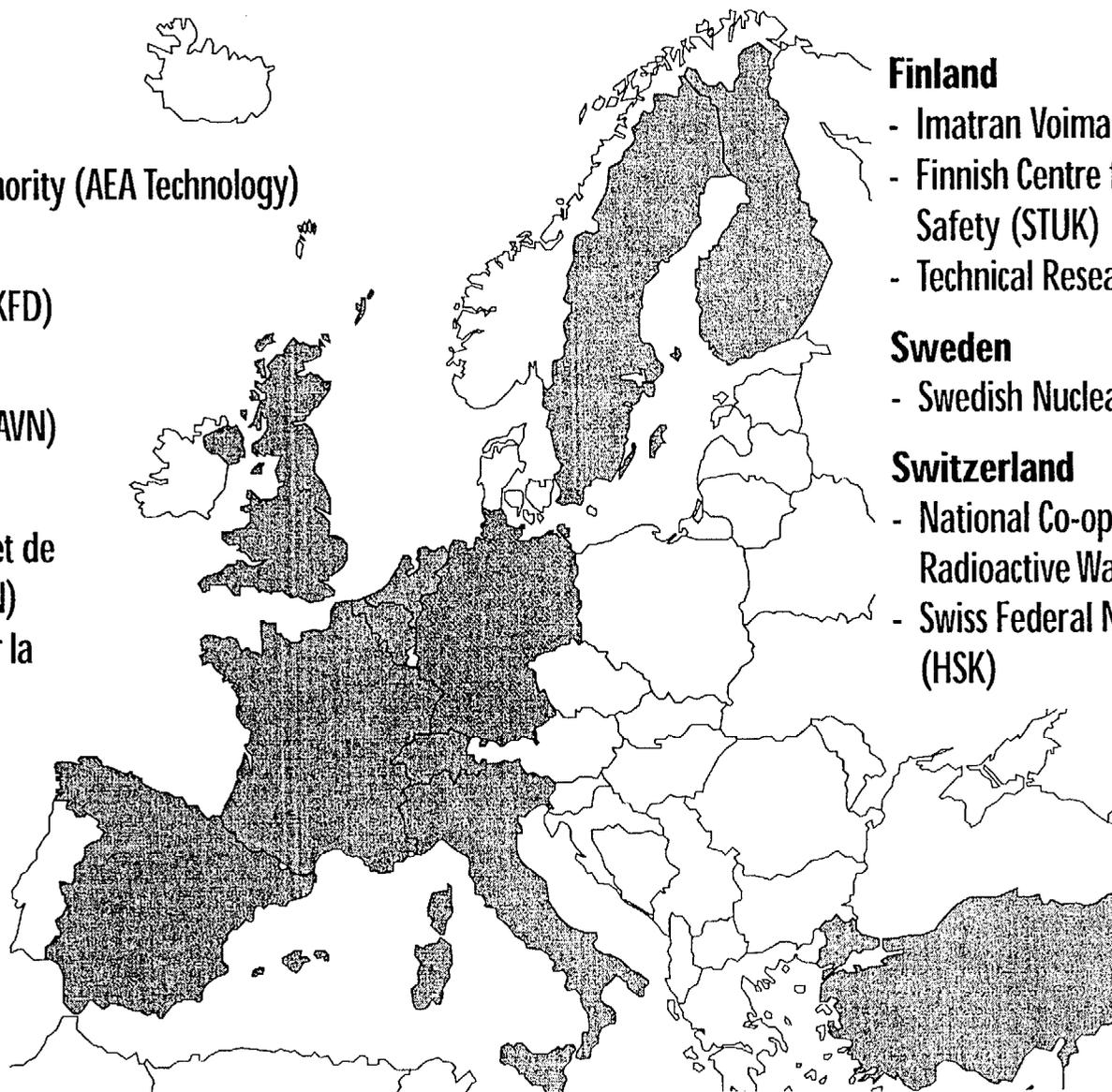
Institut de Protection et de
Sûreté Nucléaire (IPSN)

Agence Nationale pour la
Gestion des Déchets
Radioactifs (ANDRA)

Spain

Empresa Nacional des
Residuos Radioactivos
SA (ENRESA)

Consejo de Seguridad
Nuclear (CSN)



Finland

- Imatran Voima (IVO)
- Finnish Centre for Radiation and Nuclear Safety (STUK)
- Technical Research Centre of Finland (VTT)

Sweden

- Swedish Nuclear Power Inspectorate (SKI)

Switzerland

- National Co-operative for the Storage of Radioactive Waste (NAGRA)
- Swiss Federal Nuclear Safety Inspectorate (HSK)

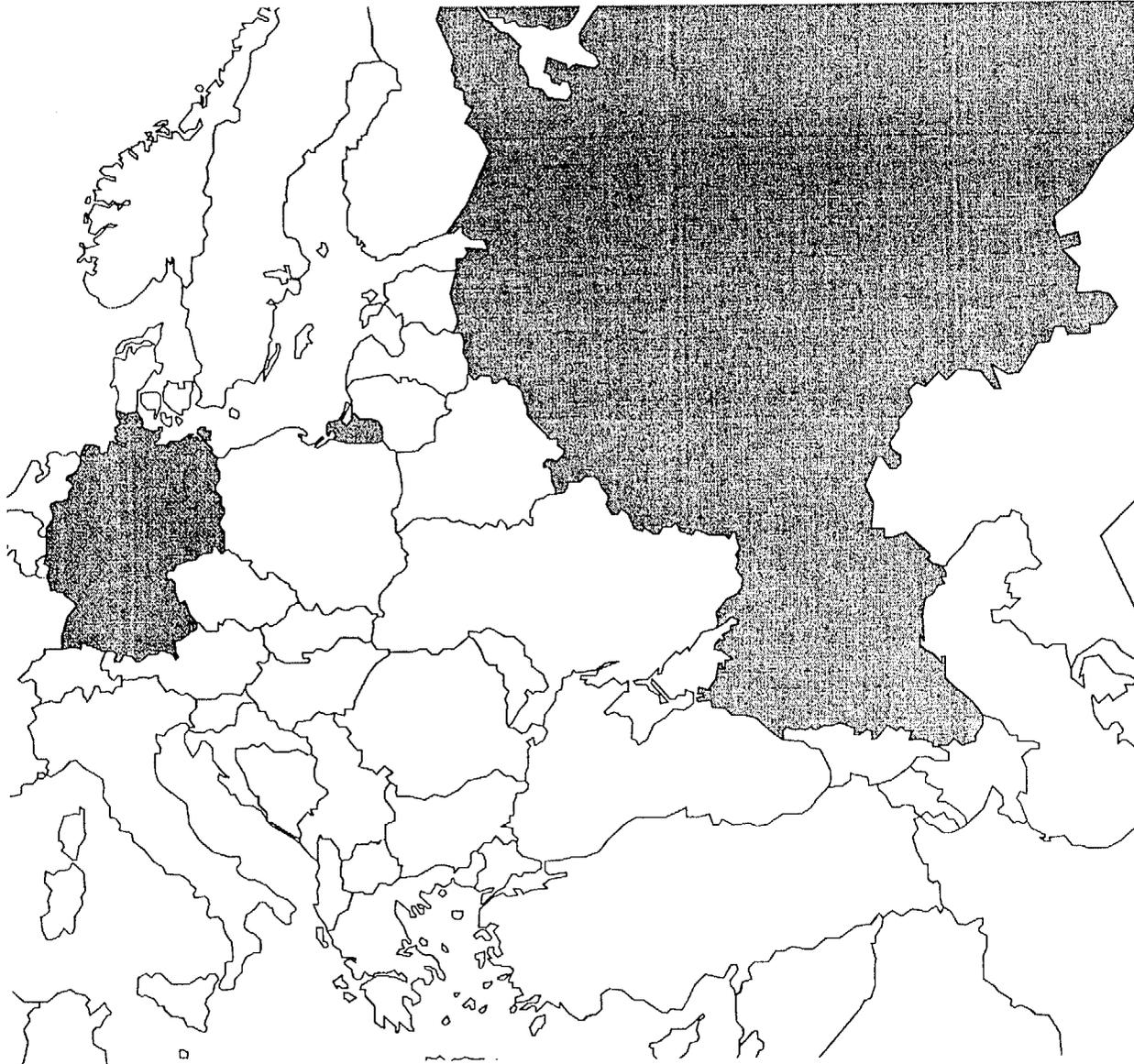
Italy

- Agenzia Nazionale per la Protezione dell' Ambiente (ANPA)

Turkey

- Türkiye Atom Enerjisi Kurumu (TAEK)

GRS and its Partners in Eastern Europe (1)



Russia

- Russian Research Centre Kurchatov Institute, Moscow
- Rosenergoatom (REA)
- Balakovskaya AES
- The Russian State Committee on Nuclear Safety and Radiation Protection
- Institute for Power Engineering NIKIET
- Experimental Design Bureau Hidropress (OKB GP), Podolsk
- Atomenergoprojekt AEP, Moscow
- Russian Academy of Sciences, Nuclear Safety Institute (IBRAE), Moscow
- Gosatomnadzor of Russia
- Scientific and Engineering Centre on Nuclear and Radiation Safety (SEC NRS, expert organisation of Gosatomnadzor of Russia)

GRS and its Partners in Eastern Europe (2)

Czech Republic

- State Office for Nuclear Safety (SONS)
- Nuclear Research Institute Rez (NRI)

Slovak Republic

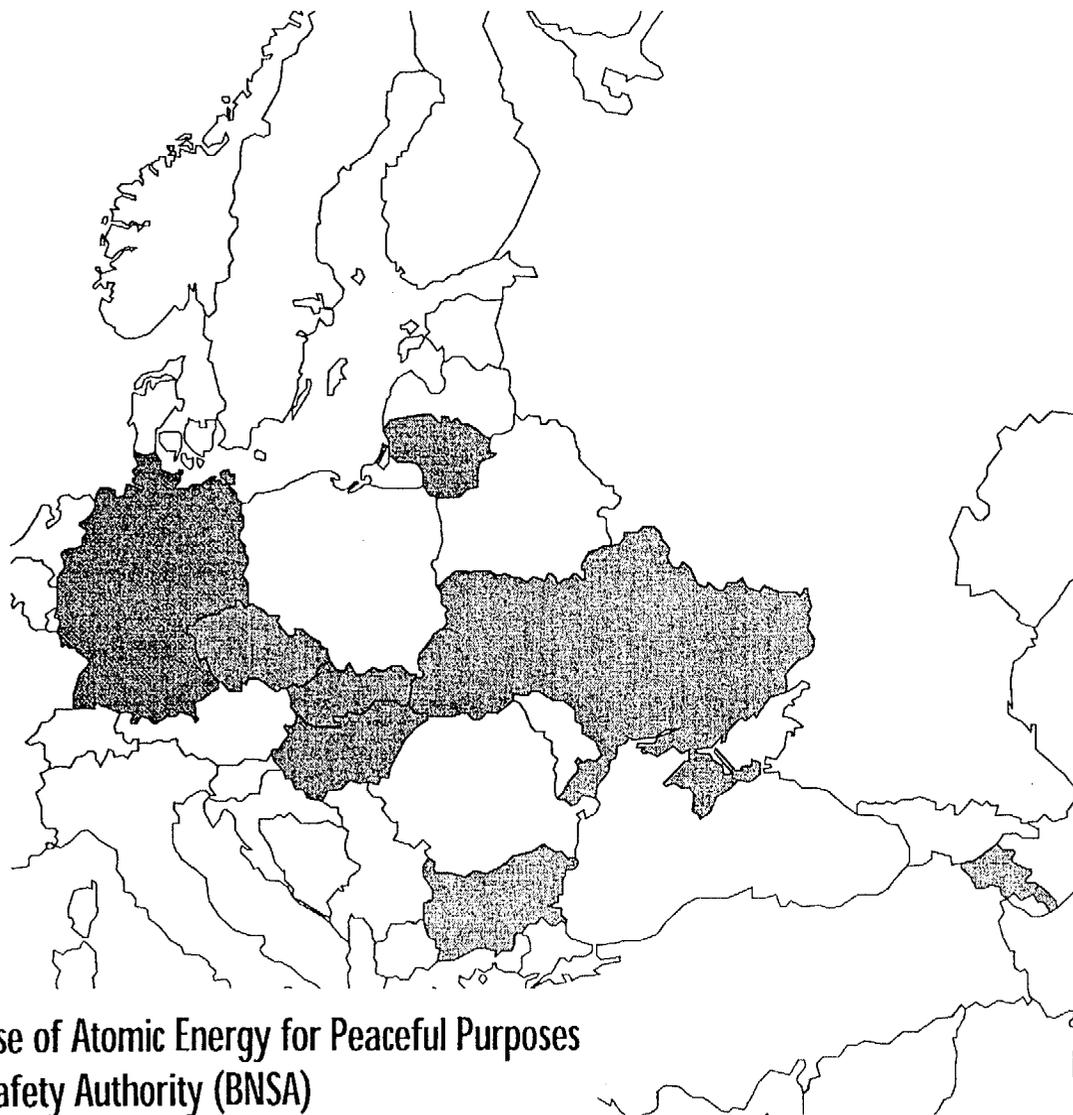
- Nuclear Regulatory Authority of the Slovak Republic

Hungary

- Hungarian Atomic Energy Commission
- Atomic Energy Research Institute (AERI)

Bulgaria

- Committee on the Use of Atomic Energy for Peaceful Purposes
- Bulgarian Nuclear Safety Authority (BNSA)



Lithuania

- Lithuanian Nuclear Power Safety Inspectorate (VATESI)
- Lithuanian Energy Institute (LEI)
- Nuclear Regulatory Authority (NRAUI)

Ukraine

- State Scientific-Technical Centre (SSTC, expert organisation of the NRA Ukraine)

Armenia

- Ministry of Energy and Fuel, Department "Armatomenergo"
- Armenian Nuclear Regulatory Authority

International Co-Operation of GRS in the Area of Reactor Safety Research

**Bilateral research projects
with CEEC&NIS within the
frame of STC of BMWi**

Russia,
Ukraine,
Czech Republic,
Slovak Republic,
Hungary, Bulgaria

**Contracts for
bilateral co-operation bet-
ween**

France,
Great Britain,
USA,
Japan,
Republic of Korea

**Bilateral contracts for
usage of GRS-Codes**

with a total of 19
countries in
Europe, Asia,
America,
South Africa

**Multilateral contracts related
to R&D projects of the
4th EU framework programme**

11 EU member
countries

**Multilateral scientific technical
co-operation within the frame
of OECD-NEA**

26 member countries in
Europe,
North America,
Asia,
Australia