

## ENIQ: EUROPEAN NETWORK FOR INSPECTION QUALIFICATION

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### BACKGROUND

Several R and D items require international cooperation either because of the nature of the resources to assemble or due to the objective of these actions: to lead to European codes and standards collaborations or simply to the harmonisation of national standards, codes and industrial practice in Europe.

The PISC exercise put under the aegis of CEC and OECD and substantially financed by the JRC of CEC is a typical example of the effectiveness of such a successful international cooperation.

Trends are developing in Europe for a better mutual knowledge and understanding of national attitudes. This leads to multinational association which could go up to European Groups of Economic Interest in most of the R and D areas; several CEC Programmes and initiatives encourage these multinational undertakings.

PISC and several national programmes and/or industrial activities in nuclear safety research in EEC and EFTA countries, have led to the setting up of national centres or organisations for the verification and validation of inspection techniques and procedures used for nuclear applications. However, these so-called "Validation Centres" could also be used for conventional applications e.g. for heavy duty industrial facilities with potential major safety and economic impacts.

These national but, in particular, the international initiatives have generated a new type of expertise and also have identified a common goal, which could effectively and economically be achieved by putting together the several national efforts in a multinational undertaking. Expertise, material and hardware could then be made available to the participating members to qualify inspection techniques and procedures in general.

By effective management of available resources, the harmonisation of national approaches towards a common European attitude for Inspection Qualification can be served.

## OBJECTIVES

The general objective is to further develop a European Network for the coordination and management of expertise and resources in the assessment and qualification of NDE inspection techniques and procedures primarily for nuclear components.

The primary focus is on the capabilities and limitations of the NDE techniques and procedures used as well as qualification of ISI through performance demonstration and other processes.

The ultimate goal will be the supporting of international Codes and Standards-bodies by making available the results (State-of-the-Art), technical tools, expertises and performance/capabilities demonstration exercises that can be sponsored and managed at the European level.

As a consequence, ENIQ could help in establishing a European attitude and certification scheme about inspection qualification in general.

## NECESSARY LIMITATIONS AND INDUSTRIAL FRAMEWORK

The collaboration does not propose inspection services and does not consider itself as a technical group for Codes and Standards elaboration and writing.

The industrial framework presently considered is primarily nuclear applications, where most of the expertise exist. However, heavy duty industrial structures and components having potential major safety and economic impacts, which in principle could be handled in the same way as nuclear components, may be included

The NDT techniques considered within the Inspection Procedures to be evaluated and qualified are:

- . volumetric inspection techniques (RT,UT, ET, Thermography,...);
- . surface inspection techniques (DT, MT, ...);
- . visual inspection techniques.

## POSSIBLE ACTIONS:

The Network is organised in Tasks which tackle precise objectives or manage projects. The major items of work now discussed to develop these tasks are as follows:

- . Discussion of the different possible schemes for inspection qualification,
  - use of performance demonstration;
  - use of technical justification based on models, on validated data (PISC type exercises), on physical reasoning;
  - combination of attitudes as a function of the qualification level required.
- . Management at the European level of materials to be used for qualification of inspection procedures and for training of inspection personnel.
 

This role also involves the advertising of the capabilities of the members, the orientation of possible customers and of problems associated with the laboratories of excellence and members of the network.
- . Organisation and management of qualification exercises for inspection techniques and procedures on appropriate mockups with the possible creation of a central bank of specimens .

- . Fabrication of test assemblies along ASME Section XI, Appendix VIII, or along any other performance demonstration scheme or along more general qualification schemes (possibly European).  
Commissioning of the new test pieces by ENIQ and the arrangement of further production could be organised, perhaps, through joint funding by the network members.
- . Support to Codes and Standards organisations as may be required:
  - Presentation, interpretation and explanation of NDT assessment studies results (PISC type exercises results) to Codes and Standards bodies.
  - Elaboration of reference material (calibration and qualification assemblies);
  - Elaboration of technical documents such as handbooks in support of international Standards and Codes.
- . Support to Licensing Authorities such as technical help for usual and unexpected problems that may arise in power plants, e.g. due to ageing of components.
- . Study of the various national positions in Europe about inspection qualification in view of identifying possible common basis for possible harmonisation.
- . Acting as a European accreditation body for qualification/certification centres: ENIQ could "approve" the qualification bodies by audit against new standards but it would be proposed that both the accreditation arrangements and the standards be introduced initially on an informal basis. Formal recognition would follow more easily if informal working arrangements already existed.

## LARGER FRAMEWORK OR POSSIBLE EVOLUTION

This network could, as a function of the requests of the members, extend its activities towards:

- Support and validation of mathematical models suitable for aiding inspection performance studies and qualification of inspection techniques;
- capabilities and limitations assessments as well as optimisation of inspection techniques and procedures;
- elaboration and establishment of generally accepted reference tools ;
- elaboration and establishment of generally accepted reference measurement methods for equipment characterisations;
- expert assessments of flawed structures e.g. cut outs from plants;
- evaluation of the capabilities and limitations as well as effectiveness of mechanised scanners or even robots leading to the qualification of these tools;
- use and further evaluation of data bases of PICS type and validation projects.

## BENEFIT

The availability of expertise, technical know-how, hardware and infrastructure from different specialised national institutions, managed in one organisation such as this European Network, could bring the following benefits:

a. *For Industry/Customers:*

- reduced (shared) investments (non-duplications) and availability of services and materials at reduced costs;
- availability and affordability, especially for small countries, which presently cannot afford such an undertaking on their own and also opportunities for medium and small companies having good NDE-technology;
- "harmonised" (European) Quality Assurance procedures and generally accepted reference material for inspection:
  - . for the developers of NDE techniques and for their applications;
  - . for the inspection companies themselves;
  - . for operators performing required inspection of their structures and/or components;
  - . for licensing authorities, providing with the availability of a generally accepted highly qualified organisation with state-of-the-art expertise and hardware for performance demonstration and qualification of the techniques and procedures used in ISI. In particular the assessment of the capabilities and limitations of the techniques and procedures used in ISI;
- information of the capabilities and limitations of existing techniques and procedures;
- optimisation of inspection techniques and procedures for specific applications;
- training of inspection personnel and technical support for their certification.
- fair and fruitful competition between institutions due to coordinated dissemination of information and advertisement and by providing equal resources;
- possibility to make use of the centres (laboratories) of their choice without national limitations

b. *For Codes and Standards*

- knowledge and understanding of national practices ;
- harmonisation of practices and of reference material;
- availability of results and technical reports agreed upon at European Level (e.g. for IIW and CEN);
- important input to European Codes and Standards, which probably lead to faster agreement;
- possibility to establish a Certification Group at European Level, for inspection procedures qualification purposes.

c. *For the Members*

- advertisement and demonstration of their capabilities, availability and specialisation;
- certification of their services, materials, and qualification of their techniques and procedures, etc. by a generally accepted organisation;
- possibility to perform services outside of the Network membership, as long as these do not contradict the charters of the Network.

## MEMBERSHIP

The "core" of the network initially based on the already existing qualification institutions in Europe but also on institutions willing to support this network subsequently developed to introduce, with priority, representatives of Plant Operators. Utilities components manufacturers and industry in general will be actively involved in one or more tasks of the "Network".

Regulatory bodies participate to the set up of the network and give their input mainly through participation of observers.

## ORGANISATION

### *Steering Committee*

The model of PISC III is used with well targeted Tasks. A Steering Committee with elected Chairman and Vice Chairman gives guidance to the Operating Agent (JRC), to the Network Manager and to the Tasks Chairmen. The Reference Laboratory (centred in principle on JRC) gives the scientific/technical support and management required with the involvement of laboratories of excellence, as a function of the Tasks considered. A Referee Group is made of Operating Agent staff members.

Country	Organisations
UK	IVC and Nucl. Electric
France	EDF
FRG	MPA and Siemens
Spain	Tecnatom and Utilities
Italy	ENEL, ANSALDO, ENEA
Belgium	AIB-Vincotte, TRACTEBEL
Switzerland	Sulzer Innotec
Sweden	Sydkraft
Finland	VTT
CEC	DG XVII/DG XI and JRC/IAM

Table 1

### *Tasks*

Tasks which are in development were proposed by the Steering Committee. Such tasks are lead by a task Chairman.

The tasks are characterised by precise short term technical objectives. Their organisation and terms of reference can vary from task to task.

Tasks members belong to institutions of the CEC/EFTA countries.

*Agreement*

The contractual aspects are covered by a club type agreement which binds the European partners together. Specific agreement can be signed by the network or Tasks of the network with non-CEC/ETFA countries institutions (e.g. OECD countries: USA, Japan,...).

This Club type agreement fixes the organisation, the roles and duties of each member or organisation and the general financial aspects.

These financial aspects are mainly:

- . each member bears his own expenses;
- . contribution to the tasks is mainly in kind;
- . compensation of non-contribution in kind and particular aspects of the tasks may require a limited cash flow from the members;
- . the network and more especially the tasks will seek funds from several sources (e.g. CEC programmes like Human Capital and Mobility, BRITE-EURAM, contracts from industry, ...).

*Officers*

Officers nominated, at the end of 1992 are:

- |  |              |                    |
|--|--------------|--------------------|
| - Chairman of the Steering Committee:      | K. Kussmaul  | MPA Stuttgart, FRG |
| - Vice-Chairman of the Steering Committee: | F. Champigny | EDF, F             |
| - Network Manager:                         | S. Crutzen   | CEC/JRC, IAM       |
| - Network Secretary:                       | P. Lemaitre  | CEC/JRC, IAM       |