



# ENIQ 2020 Roadmap

ENIQ report No 43

# ENIQ

European Network for Inspection and Qualification

The mission of the JRC-IE is to provide support to Community policies related to both nuclear and non-nuclear energy in order to ensure sustainable, secure and efficient energy production, distribution and use.

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## **ENIQ POSITION DOCUMENT**

# **ENIQ 2020 Roadmap**

*May 2011*

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*EUR 24803*

Endorsed by the ENIQ Steering Committee

ENIQ, the European Network for Inspection and Qualification, publishes three types of documents:

**Type 1 — Consensus documents**

*Consensus documents* contain harmonised principles, methods, approaches and procedures and emphasize the degree of harmonisation between ENIQ members.

**Type 2 — Position/Discussion documents**

*Position/discussion documents* contain compilations of ideas, express opinions, review practices, draw conclusions and make recommendations for technical projects.

**Type 3 — Technical reports**

*Technical reports* contain results of investigations, compilations of data, reviews and procedures without expressing any specific opinion or evaluation on behalf of ENIQ.

This 'ENIQ Position Document: ENIQ Roadmap 2020' (ENIQ Report No 43) is a type 2 document.

## FOREWORD

The present work is the outcome of the activities of the ENIQ Steering Committee.

ENIQ, the European Network for Inspection and Qualification, is driven by the nuclear utilities in the European Union and Switzerland and managed by the European Commission's Joint Research Centre (JRC). It is active in the field of in-service inspection (ISI) of nuclear power plants by non-destructive testing (NDT), and works mainly in the areas of qualification of NDT systems and risk-informed in-service inspection (RI-ISI). This technical work is performed in two task groups: TG Qualification and TG Risk.

In the recent past both ENIQ task groups have been very active. In 2005, TGR published the "European Framework Document on RI-ISI", and has since been working at producing more detailed Recommended Practices (RPs) and discussion documents on several RI-ISI related issues. Amongst which are RPs on the verification and validation of structural reliability models and guidance on the use of expert panels together with discussion documents on the application of RI ISI to the inspection of the reactor pressure vessel and updating of RI-ISI programmes. TGQ, after publishing the third issue of the European Qualification Methodology Document in 2007, has recently issued a RP on personnel qualification and a document giving an overview of inspection qualification for the non-specialist.

In 2010, the ENIQ Steering Committee recognised that the European nuclear industry was entering a period of significant change and thus initiated an internal discussion to determine its vision and objectives regarding ENIQ's future role and activities. This exercise resulted in the issuing of this strategy document, entitled the "ENIQ 2020 Roadmap" (January 2011).

This ENIQ type-2 document was approved for publication by the ENIQ Steering Committee.

The voting members of the ENIQ Steering Committee are:

T Dawood	EDF Energy, United Kingdom
P Dombret	Tractebel, Belgium
K Hukkanen	Teollisuuden Voima OY, Finland
P Kopicil	Dukovany NPP, Czech Republic
E Martin	EDF, France (chairman)
B Neundorf	Vattenfall Europe Nuclear Energy, Germany
J Neupauer	Slovenské Elektrárne, Slovakia
S Pérez	Iberdrola, Spain
U Sandberg	Forsmark NPP, Sweden
R Schwammberger	Kernkraftwerk Leibstadt, Switzerland
D Szabó	Paks NPP, Hungary

The European Commission representatives in ENIQ are O Martin and L Gandossi.

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## **1 VISION**

ENIQ will continue to be recognised as a highly respected and efficient network supporting the long term safe reliable operation of European nuclear facilities through the effective application of NDE techniques, including qualification and risk-informed ISI.

ENIQ will continue to foster and maintain collaboration with the global nuclear industry in advancing and harmonising best practices.

## **2 GENERAL OBJECTIVES**

By co-ordinating expertise and resources, the ENIQ network aims at supporting licensees and stakeholders by:

- Addressing issues where the practice and implementation of Non Destructive Evaluation (NDE) will ensure the safe and reliable operation of NPP through inspection qualification, the application of risk-informed approaches, and other processes.
- Providing recommendations and guidance to optimise and harmonise processes.
- Continually improving the processes for inspection qualification and risk informed ISI for increased effectiveness and efficiency.
- Responding to the new challenges of the world-wide nuclear renaissance including plant life extension (PLEX) and new build.
- Promoting ENIQ approaches outside Europe and in non nuclear industries.

## **3 SPECIFIC OBJECTIVES**

### **3.1 Technical areas for future work**

Ultimately, the success of ENIQ will be achieved by contributing successfully to the technical challenges that are arising within its domain, both in view of ageing nuclear power plants and new build.

ENIQ will achieve these by considering the following list of technical areas.

- Ensure a robust link between inspection and inspection qualification and the input processes such as code requirements, safety cases.
- Provide guidance on inspection qualification issues to address concerns and queries raised by members.
- Ensure that inspection results are used effectively to inform the safety assessments made by others.

- Improve the link between RI-ISI and Inspection Qualification (e.g. establish how risk reduction criteria could set ISI requirements, quantify the output of a qualified inspection, etc.).
- The role of Condition monitoring by NDE in order to improve maintenance of plants.
- The Role of RI-ISI in Defence-in Depth (pressure vessels, qualification approach, risk, etc.).
- RI-ISI for new build (including pre-service inspections).
- RI-ISI and qualification guidance for non-pressure boundary items.
- RI-ISI guidance to optimise ISI intervals.
- Develop more detailed guidance for the use of expert knowledge in RI-ISI and qualification.
- Guidance on the use of alternative methods (to ISI) for managing risk.
- Probabilistic safety assessment (PSA) (technical adequacy for RI-ISI, refinement for RI-ISI programmes).
- Guidance on Expert Judgement.
- Support extended application of computer modelling and simulations.
- Extended application of NDE qualification to other NDE methods.

### **3.2 Achieving and maintaining network excellence**

ENIQ will complement its methodology for Inspection Qualification and its Framework Document on Risk-Informed In-Service Inspection by fostering a common method of working.

ENIQ will work towards establishing common procedures and practices. In particular, it will work towards easing the transport of qualifications between countries.

ENIQ recognises the importance of engaging young engineers, and it will work towards capturing and transmitting knowledge of NDT qualification issues and the use of risk metrics to target in-service inspection.

ENIQ will aim at further improving its technical output (in terms of peer reviewed publications).

ENIQ will provide an international forum where interested parties from different countries can meet to discuss NDT issues.

ENIQ will manage Pilot studies and Round-Robin tests to investigate areas of interests for the members.

### **3.3 Maintain, update and expand existing Methodology Documents and Recommended Practices**

Document maintenance is essential for the ENIQ network to maintain credibility. The ENIQ network will periodically review (and, if necessary, revise/update/expand) Methodology Documents and Recommended Practices to confirm that the current issues remain valid.

## 4 TOOLS

To better achieve its objectives, the ENIQ network recognises that an increased visibility and improved working mechanisms are necessary.

### 4.1 Increased visibility

ENIQ recognises the importance of increasing the visibility of its rationale and activities, at all levels (EU policy makers, regulators, users within utilities, etc.). An increased awareness of the importance of inspection qualification and risk-informed methods will ultimately benefit the safety of nuclear power plants globally.

An increased awareness will promote continued support from the European Commission, which is considered essential for the success of the network.

To achieve these objectives, ENIQ will:

- Extend its influence outside Europe.
- Increase interaction with the IAEA.
- Have more regular interactions with nuclear regulatory agencies.
- Present its work regularly at international conferences.

More specific objectives are as follows:

- Investigate the possibility to register "ENIQ" as a trademark
- Produce a "position" paper. This report will explain what reasons led to the creation of ENIQ, what the network has achieved, what is the current situation in all countries that adopt the ENIQ methodologies and/or Recommended Practices (RPs). The report will also include a thorough list of all laws, regulations, codes, reports, etc. that mention ENIQ documents or RPs, both explicitly and implicitly.
- Produce "promotional" material, for instance a presentation of network activities that will be kept updated and that will assist the network members if they need to present ENIQ to internal or external stakeholders in their organisation or country.
- Produce a reference list of publications about ENIQ
- Regularly update the ENIQ website.
- Regularly publish an ENIQ newsletter.

## **4.2 Improved working mechanisms**

To achieve its objectives, ENIQ recognise that its working mechanisms can be improved.

ENIQ will:

- Consider the development of an appropriate funding mechanism;
- Investigate the possibility of becoming an organisation such as EPRI or ASME: membership fee, own facilities, common databases (e.g. for test pieces), etc.;
- Broaden its expertise (including experts on structural integrity, materials, etc.)
- Investigate the possibility of creating other task groups (e.g. on structural integrity).

## **5 SHORT-TERM WORK PROGRAM**

The following Table summarises some activities for the short-term period (1-2 years).

<b>Activity</b>	<b>Purpose</b>	<b>Content</b>	<b>Timescale</b>
<b>1</b> Position Paper	<ul style="list-style-type: none"> <li>• Promote the importance of ENIQ to stakeholders.</li> <li>• Provide a mechanism for engaging with all stakeholders.</li> </ul>	<ul style="list-style-type: none"> <li>• Background to the formation of ENIQ.</li> <li>• Network achievements.</li> <li>• The benefits.</li> <li>• General areas for future work activities.</li> </ul>	Publication by Dec 2011.
<b>2</b> Promoting regulatory understanding	<p>Obtain regulatory feedback on developments within ENIQ:</p> <ul style="list-style-type: none"> <li>• Mutual recognition of qualifications between countries.</li> <li>• Implementation of different RI-ISI approaches.</li> <li>• Quantitative PoD.</li> </ul>	<ul style="list-style-type: none"> <li>• The drive will need to come from licensees supported technically by TGQ and TGR.</li> <li>• Possibility of regulator workshops, re-establishing the NRWG.</li> </ul>	To be considered
<b>3</b> IQB Workshops	<ul style="list-style-type: none"> <li>• Facilitate regulatory understanding of how qualification is performed in different countries (mainly ENIQ and ASME).</li> <li>• Provide a forum for identifying good practices.</li> <li>• Improving the processes and effectiveness of inspection qualification.</li> </ul>	<ul style="list-style-type: none"> <li>• Regular workshops for recognised inspection qualification bodies.</li> <li>• Production of recommendations for work to be taken up by other organisations.</li> </ul>	Scope to be agreed by end of March 2011. Extensive workshop to be held in Seattle at the 9th NDE conference.
<b>4</b> Formal review of ENIQ Documents	<ul style="list-style-type: none"> <li>• Ensure that ENIQ documents (Methodology documents and RPs) remain valid and relevant.</li> <li>• Enable users to understand the status of all documents.</li> </ul>	<ul style="list-style-type: none"> <li>• Develop a formal process of periodic review for each of the documents (even if there are no changes the review should reflect this).</li> <li>• Amend the ENIQ website with current status of each document.</li> </ul>	Develop an appropriate review scheme by October 2011 Rolling, ongoing programme for document review.
<b>5</b> Justification of Risk-Reduction through ISI	<ul style="list-style-type: none"> <li>• To determine level of risk reduction that is achievable through ISI.</li> </ul>	<ul style="list-style-type: none"> <li>• Produce discussion document on the role and expectations of ISI.</li> <li>• Role of quantitative PoD in risk reduction.</li> </ul>	Discussion document by mid-2012.
<b>6</b> Decide and Develop Funding Scheme	<ul style="list-style-type: none"> <li>• Ensure that ENIQ activities are performed in a timely, accountable and professional manner.</li> </ul>	<ul style="list-style-type: none"> <li>• Agree on the principle of a contributory ENIQ funding scheme.</li> <li>• Develop an appropriate funding mechanism (subject to agreement).</li> <li>• Agree payment scheme.</li> </ul>	Aim to have a funding mechanism in place by Dec 2011

<b>Activity</b>	<b>Purpose</b>	<b>Content</b>	<b>Timescale</b>
<b>7</b> ENIQ Webpage	<ul style="list-style-type: none"> <li>• The ENIQ webpage is an important mechanism for disseminating the ENIQ work.</li> <li>• Timely update of ENIQ content will enhance the perception of ENIQ amongst users and its usefulness.</li> </ul>	<ul style="list-style-type: none"> <li>• Seek ways of enhancing communication of updates (newsletter, email).</li> <li>• Potential for different levels of access.</li> </ul>	Continual
<b>8</b> Promotion of ENIQ through seminars and conferences	<ul style="list-style-type: none"> <li>• Increase awareness of the benefits of participation in ENIQ.</li> <li>• Promote ENIQ activities and developments to a wide range of stakeholders.</li> <li>• Increase participation in ENIQ.</li> <li>• Maintain and enhance the reputation of ENIQ.</li> </ul>	<ul style="list-style-type: none"> <li>• Identify conferences, workshops to present ENIQ work.</li> <li>• Make presentations at conferences and workshops.</li> </ul>	Continual
<b>9</b> Develop a PoD Methodology	<ul style="list-style-type: none"> <li>• Provide quantitative NDT performance information for RI-ISI.</li> <li>• Mechanism for meeting quantitative ISI objectives.</li> </ul>	<ul style="list-style-type: none"> <li>• Produce specification for quantitative PoD.</li> <li>• Review and assess approaches for producing PoD.</li> <li>• Pilot study on application of Monte-Carlo approach for producing PoD.</li> </ul>	To be considered
<b>10</b> Pilot Studies	<ul style="list-style-type: none"> <li>• Pilot studies are an effective way of developing practice.</li> <li>• A regular programme of pilot studies promote active participation in ENIQ activities by a wide range of organisations.</li> </ul>	<ul style="list-style-type: none"> <li>• Identify pilot studies for TGQ and TGR.</li> <li>• Pilot study on mutual recognition for inspection qualification.</li> <li>• Pilot study on Monte-Carlo approach to PoD.</li> </ul>	To be considered
<b>11</b> Engagement with Stakeholders	<ul style="list-style-type: none"> <li>• Ensure that ENIQ activities are meeting industries needs.</li> <li>• Ensure ENIQ objectives are consistent with other organisations and networks.</li> <li>• Improve the efficiency of generating ENIQ output.</li> </ul>	<ul style="list-style-type: none"> <li>• First step: identify other relevant organisations and networks.</li> <li>• Establish contacts and seek participation.</li> </ul>	To be considered
<b>12</b> RI-PSI for European New Build	<ul style="list-style-type: none"> <li>• Develop consensus view on RI-PSI.</li> </ul>	<ul style="list-style-type: none"> <li>• Review development in ASME and at Olkiluoto.</li> <li>• Produce ENIQ discussion document.</li> </ul>	To be considered

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European Commission

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**Abstract**

ENIQ, the European Network for Inspection and Qualification, is driven by the nuclear utilities in the European Union and Switzerland and managed by the European Commission's Joint Research Centre (JRC). It is active in the field of in-service inspection (ISI) of nuclear power plants by non-destructive testing (NDT), and works mainly in the areas of qualification of NDT systems and risk-informed in-service inspection (RI-ISI). In 2010, the ENIQ Steering Committee recognised that the European nuclear industry is at a turning point and thus initiated an internal discussion to determine its vision and objectives regarding the network's future role and activities. This exercise resulted in the issuing of the present position document.

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