

# **Review of the Role, Activities and Working Methods of the CNRA**

**Committee on Nuclear  
Regulatory Activities (CNRA)**

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NUCLEAR ENERGY AGENCY  
ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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The OECD Nuclear Energy Agency (NEA) was established on 1<sup>st</sup> February 1958 under the name of the OEEC European Nuclear Energy Agency. It received its present designation on 20<sup>th</sup> April 1972, when Japan became its first non-European full member. NEA membership today consists of 28 OECD member countries: Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Luxembourg, Mexico, the Netherlands, Norway, Portugal, Republic of Korea, the Slovak Republic, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The Commission of the European Communities also takes part in the work of the Agency.

The mission of the NEA is:

- to assist its member countries in maintaining and further developing, through international co-operation, the scientific, technological and legal bases required for a safe, environmentally friendly and economical use of nuclear energy for peaceful purposes, as well as
- to provide authoritative assessments and to forge common understandings on key issues, as input to government decisions on nuclear energy policy and to broader OECD policy analyses in areas such as energy and sustainable development.

Specific areas of competence of the NEA include safety and regulation of nuclear activities, radioactive waste management, radiological protection, nuclear science, economic and technical analyses of the nuclear fuel cycle, nuclear law and liability, and public information. The NEA Data Bank provides nuclear data and computer program services for participating countries.

In these and related tasks, the NEA works in close collaboration with the International Atomic Energy Agency in Vienna, with which it has a Co-operation Agreement, as well as with other international organisations in the nuclear field.

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## FOREWORD

At its June 2004 meeting the NEA Committee on Nuclear Regulatory Activities (CNRA) agreed to set up an independent Review Group to review the role, activities and working methods of the CNRA. It was agreed that members of the Review Group would consist of former members of the CNRA or those with detailed knowledge of its history.

In preparing this report, the Review Group gathered information by examining CNRA documents (e.g. summary records, reports), holding interviews (with past and present CNRA members, working group chairs, the NEA secretariat) and through responses to a short questionnaire received from CNRA members and NEA standing technical committee chairs.

The report was finalised on the basis of discussions with, and input provided by, the members of the Review Group. The Review Group was chaired by Lars Högberg (Sweden) and consisted of the following members:

- Michel Asty (France),
- Kazuo Sato (Japan),
- Eduardo Gonzalez Gomez (Spain),
- Jim Furness (United Kingdom),
- Sam Collins (United States),
- NEA Secretary: Barry Kaufer.

## **COMMITTEE ON NUCLEAR REGULATORY ACTIVITIES**

The Committee on Nuclear Regulatory Activities (CNRA) of the OECD Nuclear Energy Agency (NEA) is an international committee made up primarily of senior nuclear regulators. It was set up in 1989 as a forum for the exchange of information and experience among regulatory organisations.

The Committee is responsible for the programme of the NEA concerning the regulation, licensing and inspection of nuclear installations with regard to safety. The Committee's purpose is to promote co-operation among member countries to use the feedback from experience to develop measures to improve safety, to enhance efficiency and effectiveness in the regulatory process and to maintain adequate infrastructure and competence in the nuclear safety field. The CNRA's main tasks are to review developments which could affect regulatory requirements with the objective of providing members with an understanding of the motivation for new regulatory requirements under consideration and an opportunity to offer suggestions that might improve them or avoid disparities among member countries. In particular, the Committee reviews current management strategies and safety management practices and operating experiences at nuclear facilities with a view to disseminating lessons learned.

The Committee focuses primarily on existing power reactors and other nuclear installations; it may also consider the regulatory implications of new designs of power reactors and other types of nuclear installations.

In implementing its programme, the CNRA establishes cooperative mechanisms with the Committee on the Safety of Nuclear Installations (CSNI) responsible for the programme of the Agency concerning the technical aspects of the design, construction and operation of nuclear installations. The Committee also co-operates with the NEA Committee on Radiation Protection and Public Health (CRPPH) and the NEA Radioactive Waste Management Committee (RWMC) on matters of common interest.

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## EXECUTIVE SUMMARY

The Review Group concludes that the Committee on Nuclear Regulatory Activities (CNRA) role and mandate are basically sound and the committee is functioning well. The CNRA provides a unique forum for the professional exchange of information and experience among regulatory organisations that regulate close to 90% of the operating nuclear power reactors in the world.

While the Review Group found no need for fundamental and wide-ranging changes, the role of the CNRA should be further developed, consistent with its responsibility for the programme of the Agency concerning the regulation, licensing and inspection of nuclear installations with regard to safety, as stated in the CNRA mandate. The Review Group recommends that the CNRA provides the NEA Steering Committee with periodic, comprehensive and balanced overviews of safety regulation issues, thereby ensuring that cross-cutting regulatory issues are properly dealt with through improved co-operation between the various NEA committees concerned.

The Joint CSNI/CNRA Strategic Plan is a commendable effort to align the functions of these two committees. In general terms, the scope of current topics in the Joint Strategic Plan is comprehensive, but carries a potential for work overload. The Review Group recommends that existing and future work be strongly prioritised, based on added-value to safety and usefulness to many member organisations, recognising the limitations in member and NEA Secretariat resources. The Review Group requests NEA to consider increasing the Secretariat resources available to the CNRA.

The Review Group welcomes the CNRA review of the mandates and work programmes of the Working Group on Inspection Practices (WGIP) and the Working Group on Public Communication (WGPC). Some organisational changes to the Working Group structure, and attention to the definition of roles and responsibilities regarding the CNRA relationship with other NEA committees, are needed. The Review Group found that enhanced co-operation, co-ordination and communication amongst standing committees is necessary to clarify priorities and required products, and to address cross-cutting regulatory issues in a timely way. Specifically, the Review Group proposes that the interaction with CSNI should be further improved, to ensure the timely input to the CNRA of CSNI expertise, both in a shorter and longer time perspective.

The Review Group emphasizes the importance to regulators of the efficient and effective review and dissemination of operating experience, derived from both incident analysis and inspection findings. The Review Group concludes that, in order to enhance the short-term evaluation and consideration of regulatory action and achieve alignment on longer-term studies needed, it would be more appropriate that the Working Group on Operating Experience (WGOE) belongs to the CNRA, while continuing to serve also the CSNI.

As nuclear technology matures, “soft” issues, e.g. related to safety management, become as important as technical issues. While social, human factors and communication challenges are not generally as readily solvable in a technical sense, the CNRA should continue to act as a valuable forum for discussion of such “soft” issues.

The Review Group recommends that the NEA Secretariat continues its efforts to achieve good co-ordination with the International Atomic Energy Agency (IAEA) in order to prevent any perceived duplication of work.



## PART I. CONCLUSIONS AND RECOMMENDATIONS

This part of the report contains the conclusions and recommendations of the Review Group. They are based on the background material presented in Part II and on the collective experience of the Review Group members as earlier active participants in NEA activities. The mandate and composition of the Review Group as well as a short description of how it has conducted its review can be found in Appendix A.

The conclusions and recommendations are rather extensive, partly because of the Review Group's wish to address the considerable number of questions raised, not least in input received from CNRA members and from other NEA committees, and partly because of the Review Group's desire, not only to recommend changes which it found appropriate, but also to point to practices that the Review Group found commendable, and which therefore should be continued.

Additionally, the Review Group performed a comparison between this review and the review performed in 1997 to ensure that there were no open items. This comparison is provided as Appendix B to the report.

Finally, the main documents referenced in the report (denoted by [number]) are listed in Appendix C and a list of acronyms is provided as Appendix D.

### 1. General conclusions on the role of the CNRA

As a starting point, the Review Group notes that Nuclear safety and regulation has been assigned the highest priority of the strategic areas listed in the Strategic Plan [1], and that the CNRA, according to its mandate, *“shall be responsible for the programme of the Agency concerning the regulation, licensing and inspection of nuclear installations with regard to safety.”*

Moreover, the Review Group notes that the CNRA member organisations, including observers,<sup>1</sup> today regulate close to 90% of the operating nuclear power reactors in the world.<sup>2</sup> Therefore, it is evident to the Review Group that the CNRA functions as an important and influential forum and network for international professional exchange of information on regulatory approaches and regulatory experience.

The importance and usefulness of the CNRA to member organisations is demonstrated by the resources they assign to CNRA work: in recent years, typically about 1 500 person-days per year are spent in attending meetings, including travel and preparation, and in contributions to the reports and other documents. The number of meetings, workshops, etc. arranged each year under the auspices of the CNRA has approximately doubled over the past ten years.

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1. Russian Federation and Slovenia.

2. IAEA Power Reactor Information System (PRIS) as per 2004-12-17.

Although the CNRA does not issue specific formal recommendations on safety standards or regulatory procedures, the Review Group concludes its work nevertheless exerts a considerable influence on international regulatory developments in several ways, such as:

- CNRA work provides member organisations with a common understanding of current and emerging regulatory issues which can then be used as a basis for regulatory developments in the national context, taking into account the characteristics of the various national legislative systems for the regulation of nuclear activities.
- As all the NEA member countries are also members of the IAEA, and CNRA member organisations are typically active in the IAEA programme on international safety standards, common insights gained from CNRA work are often used in the development of IAEA safety standards – as well as in the review processes under the international Convention on Nuclear Safety and the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management.
- The co-operation network provided by the CNRA facilitates bilateral consultations between member organisations on specific and urgent regulatory issues that emerge in the national context.
- Documents issued by the CNRA and its Working Groups may help operating organisations in their understanding of regulatory actions.

Over the past decades, the role of governments with regard to nuclear power has changed considerably in most NEA countries. Historically, many governments took an active part in developing nuclear power technology and in nuclear power production. Today many governments move to restrict their role to safety regulation of utilities operating in increasingly privatised and highly competitive electricity markets. This is particularly evident in Europe, with a common electricity market developing within an enlarged European Union. The Review Group concludes that these changes in the role of governments strengthen the importance of the CNRA as a part of the framework for intergovernmental co-operation provided by the OECD/NEA.

According to its mandate [2,3], the CNRA shall be responsible for the programme of the Agency concerning the regulation, licensing and inspection of nuclear installations with regard to safety. While the term “nuclear installation” has a narrow definition in the Convention on Nuclear Safety, it has traditionally had a much wider definition in the context of NEA work and in most national legislations in NEA member states. The Review Group takes the view that this wider definition, in principle including all types of civil nuclear installations, should continue to be used in the NEA context, and thus when interpreting the mandate of the CNRA.

The Review Group is well aware that two other committees of the NEA, namely the Committee on Radiation Protection and Public Health (CRPPH) and the Radioactive Waste Management Committee (RWMC), also deal with specific aspects of the regulation of nuclear installations. While the Review Group has found no evidence of significant overlap or duplication of work between the CNRA and these committees, it has noted that the changing environment (i.e. increasing number of cross-cutting issues) will require a increased co-ordination and communication in the future (see further below).

The Review Group also concludes that the division of work and co-operation between the CNRA and the CSNI basically works well, but with some room for improvement, notably in the area of analysis of operational and inspection experience, and with regard to further development of the interplay between the CNRA and the CSNI.

The Review Group noted that there has been a trend over the past decades towards closer co-operation and co-ordination between the two traditional fields of nuclear safety and radiation protection in the regulation of nuclear installations. This is, for example, evident in the two international safety conventions as well as in a recent ruling by the EU Court of Justice on the interpretation of the Euratom Treaty.<sup>3</sup>

Taking all the above considerations into account, the Review Group concludes that there are no reasons for fundamental and wide-ranging changes in the role and mandate of the CNRA, as approved by the CNRA in December 2004. However, considering in particular the changing role of governments, and the increasingly holistic approach taken to the regulation of nuclear installations, the Review Group concludes that the role of the CNRA should be further developed, consistent with the CNRA responsibility for the programme of the Agency concerning the regulation, licensing and inspection of nuclear installations with regard to safety, as stated in the CNRA mandate. The Group recommends that the CNRA provides the NEA Steering Committee with periodic, comprehensive and balanced overviews of safety regulation issues, and how they are addressed by the various NEA committees, thereby ensuring that cross-cutting regulatory issues are properly dealt with through improved co-operation between the committees concerned. Specific recommendations to that effect are given in the following sections.

## **2. Programme of work and priorities**

The Review Group welcomes the development and adoption of the Joint CSNI/CNRA Strategic Plan [2], as it represents a common understanding of the scientific and technical safety issues that are facing the two committees, now and over the next five years. The Joint Strategic Plan has to a large extent taken into account the 1997 CNRA report on Future Nuclear Regulatory Challenges [4] which identified some 100 or more issues of potential interest. Moreover, the Group welcomes the CNRA Bureau decision in January 2005 to conduct periodic checks of the main challenges listed in the Joint Strategic Plan as a part of the preparation of each work programme.

### **2.1 Areas and issues in focus**

In general terms, the Review Group did not identify any significant regulatory issues that were not already included in the 1997 report on Future Nuclear Regulatory Challenges [4] and in the Joint Strategic Plan. There was, however, a broad consensus in the Review Group on the areas for the CNRA mainly to focus on.<sup>4</sup> It is not surprising that a first group of areas and issues is largely

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3. Judgement of the EU Court of Justice on 10 December 2002 in Case C-29/99, regarding external competence of the Community – Articles 30 to 39 of the Euratom Treaty – and the interpretation of the provisions in these articles relating to health and safety. The Court concluded that it is not appropriate to draw an artificial distinction between the protection of the health of the general public and the safety of sources of ionising radiation.

4. Physical protection of nuclear installations against terrorism has been identified as an obvious safety and policy challenge. It has however been found unsuitable for the type of open, multilateral technical discussions that characterises the NEA work, due to the high degree of confidentiality that applies to much of the information. Moreover, the IAEA has launched a substantial programme in the area and the IAEA has a long experience with handling classified information on a bilateral basis, through its work in the non-proliferation area.

associated with operational safety of an ageing reactor fleet and changing patterns of NPP ownership and electricity markets:

- management of plant ageing;
- life extension and licence renewal, including upgrading to new standards;
- power upgrades and safety margins at existing reactors;
- succession planning for staff in utilities, TSOs and regulatory bodies;
- organisational matters – nuclear facilities as part of wider energy supply utilities;
- human factors; and
- decommissioning.

All these areas and issues include technical and scientific aspects, as well as regulatory policy aspects.

A second group of areas and issues concerns the regulatory process itself:

- risk-informed regulation;
- public information, as part of the regulatory process; and
- regulatory efficiency/effectiveness.

This group of areas and issues is mainly associated with regulatory policy and working methods.

Moreover, the Review Group has found that assessments of operating and inspection experience should be regarded as a third area that cuts across all the preceding areas and issues and in fact, the CNRA has clearly recognised the use of operating and inspection experience as an essential element in ensuring nuclear safety.

The Review Group notes that, as nuclear technology matures, “soft” issues, e.g. related to safety management become as important as technical issues. While social, human factors and communications challenges are not generally as readily solvable in a technical sense, the CNRA should continue to act as a valuable forum for discussion of such “soft” issues.

In a longer term perspective than covered by the present Strategic Plan, new reactor concepts, such as those studied by the Generation IV International Forum, may enter the licensing phase. So, for the coming years, the Review Group concludes that it would be sufficient for the CNRA to limit itself to periodic updates on emerging new designs and related regulatory issues, at the same time ensuring that the CSNI will be well prepared to brief the CNRA on the technical safety aspects of any new designs, if and when they approach the licensing stage.

## ***2.2 Selecting issues and setting priorities***

The above areas are covered in the new Joint Strategic Plan, and have been discussed by the CNRA. Considering the resources available for CNRA related work in the member organisations, in other NEA committees and in the NEA Secretariat, the Review Group finds it extremely important that the CNRA now selects the issues of highest priority from a regulatory point of view in its programme of work for the next few years. This includes issues to be mainly handled by the CNRA itself, or by one of its working groups or task forces, as well as issues for which the CNRA needs

scientific and technical support from other committees, notably the CSNI, and issues that preferably should be dealt with in other committees, although the CNRA remains interested in the output.

While it is primarily the task of the CNRA Bureau to prepare this detailed selection of issues and propose priorities, the Review Group recommends that a transparent and structured approach along the following lines is used in this selection and priority-setting process. Thus, the Review Group recommends that the following general selection criteria are applied as a first step:

- the issue is of relevance to many member countries;
- international co-operation is essential, or at least useful, to address, and possibly resolve, the issue;
- the expected output will provide significant added-value to nuclear safety; and
- the NEA is the best place for international co-operation on this specific issue.

In a second step, the Review Group recommends that each issue be handled in one of three ways, depending on whether:

- The issue is of a short to medium term regulatory concern. In such a case, the issue should be considered to be put on the CNRA agenda for the next 1-2 years, aiming at achieving a common understanding of the issue and possible regulatory approaches to deal with it, based on the best available scientific and technical knowledge that can be compiled in such a timeframe. Issues requiring additional scientific or technical support will typically require assistance by the appropriate experts from the CSNI network providing information on the current state of the art.
- The issue is of a more long-term regulatory concern. In such a case, the appropriate technical committee, typically the CSNI, should be invited to provide additional scientific and technical insights, e.g. through additional experiments, development of improved computer models, etc., with subsequent long-term follow-up by the CNRA. The CNRA has of course to deal itself with long-term issues related to regulatory approaches and working methods.
- The issue should preferably be dealt with in other committees, such as the RWMC or the CRPPH, although some joint activities may be needed to handle regulatory issues of a cross-cutting character. In such cases, the CNRA should ensure that the appropriate co-operative mechanisms are established to keep itself informed of the regulatory implications of the work.

The Review Group notes that several issues may include both a short term and a long term component, meaning that some type of regulatory action may be prudent in a relatively short timeframe, at the same time as additional research may be needed to develop more long-term regulatory approaches. Such aspects need of course to be considered explicitly by the CNRA when developing its programme of work.

In a third step in the selection and priority-setting process, the Review Group recommends that the CNRA explicitly considers that an appropriate balance is achieved between on the one hand, a reactive response to regulatory issues derived from assessments of operating and inspection experience and, on the other, proactive attention to emerging regulatory issues that can be foreseen from assessments of technical, economic and organisational trends with potential safety impact, including issues related to government or industry concerns about regulatory effectiveness and efficiency.

Some further and more detailed guidance on CNRA priority-setting can be found in Part II, Section 5.

### ***2.3 Overviews of NEA work on nuclear safety regulation***

As indicated in Part I, Section 1, the Review Group has concluded that the work of the NEA and its Steering Committee would benefit from periodic, comprehensive overviews of safety regulation issues and NEA response to them. The Review Group recommends that the CNRA, after approval by the Steering Committee, undertakes to prepare such periodic overviews in co-operation with the other committees involved, mainly the CSNI, the CRPPH and the RWMC, but also to some extent the NDC. The objective of such overviews should be:

- To provide the Steering Committee (and thereby the NEA member countries), as well as all NEA standing committees involved in regulatory matters, with a common overview from a holistic perspective of the NEA work on nuclear safety regulation, and current and future issues of concern.
- To stimulate co-operation between the NEA standing committees with a view to ensuring that the total NEA programme of work on nuclear safety regulation is well balanced and appropriately distributed between the NEA committees involved.
- To stimulate co-operation between the NEA standing committees on cross-cutting regulatory topics, often of a policy nature, such as:
  - the concept of “reasonable assurance of safety” when licensing new designs (whether new types of reactors or geological repositories for spent fuel and long-lived radioactive waste), or revising existing safety regulations and radiation protection criteria;
  - trust in regulatory bodies and interaction with stakeholders;
  - communication with the public in nuclear emergencies;
  - decommissioning of nuclear facilities;
  - regulatory effectiveness and efficiency.

The overviews should also include assessments of the usefulness of NEA work on nuclear safety regulation to regulatory bodies in the NEA member countries.

Such periodic overviews should be prepared and updated at intervals commensurate with the NEA planning cycles. Thus, major revisions should be made as a part of the preparation of each strategic plan, with short updates, as appropriate, in connection with the preparation of the two-year programme of work. The overviews should make use of, but not duplicate, information prepared in other contexts, such as the review processes under the two international safety conventions and the IAEA reports on nuclear safety. Major revisions of the overview should benefit from being discussed at an NEA Safety Regulatory Forum.

The Review Group finds the undertaking to prepare such overviews to be fully in line with the present CNRA mandate, namely that the CNRA shall be responsible for the programme of the Agency concerning the regulation, licensing and inspection of nuclear installations with regard to safety.

## **2.4 Volume of CNRA work and resource limitations**

The Review Group concludes from the observations in the following chapters that the volume of CNRA work over the past decade has increased to such an extent that the available resources are now stretched to the limit, both within the NEA Secretariat and in the form of effort from member organisation experts. Substantial increases in productivity have been achieved through the use of modern information technology and the support of highly qualified consultants. However, both the NEA Secretariat and most of the CNRA member organisations can be expected to have to live with significant budgetary constraints for the foreseeable future.

The Review Group therefore concludes that further expansion of the CNRA work volume does not appear realistic, and recommends that the CNRA Bureau together with the NEA Secretariat makes a thorough assessment to check that the future programme of work is commensurate with the available resources, both those at the Secretariat and those assigned by member organisations, so that timely and useful output can be ensured on the issues of highest priority according to the criteria in the previous sections. As a part of such an assessment, the Review Group recommends that the NEA considers some reallocation of Secretariat resources to the CNRA, taking into account the increase in the CNRA workload over the past years, as well as the recommendations of the Review Group in this report concerning some future tasks of the CNRA.

## **3. Working groups**

### **3.1 Working Group on Inspection Practices (WGIP)**

The Review Group notes that the WGIP has functioned well since it was formed in 1990 and has provided a unique co-operation forum between persons with hands-on experience from inspections. After a number of surveys and reports from the WGIP, the CNRA has now identified a need for some changes in the WGIP programme and working methods, and has started a review to that effect. The Review Group welcomes this action and recommends that the following aspects are taken into account:

- WGIP's function as a professional meeting forum for inspectors should be preserved, and meetings should generally be held at senior inspector level. Occasional "tutorial seminars" for junior inspectors might be considered.
- As noted by the CNRA, the underlying concept of the WGIP should be expanded from inspection to cover an integrated assessment of lessons learnt from inspection activities (i.e. inspection results, reviews, reports, indicators, etc.). New tasks performed by the group should focus on evolving inspection issues and methods.
- National legal and organisational frameworks for inspection activities differ widely among the NEA member countries. Too detailed work on commendable inspection practices which may be of limited use to several CNRA member organisations should therefore be avoided.
- Analysis of operating experience and analysis of inspection experience are both of high importance for regulatory oversight of operational safety.<sup>5</sup> The CNRA should therefore explore possible synergy effects that could be obtained through a closer interaction between the WGIP and the CSNI Working Group on Operational Experience (WGOE) with regard to identifying safety issues that merit special attention by the CNRA and its member

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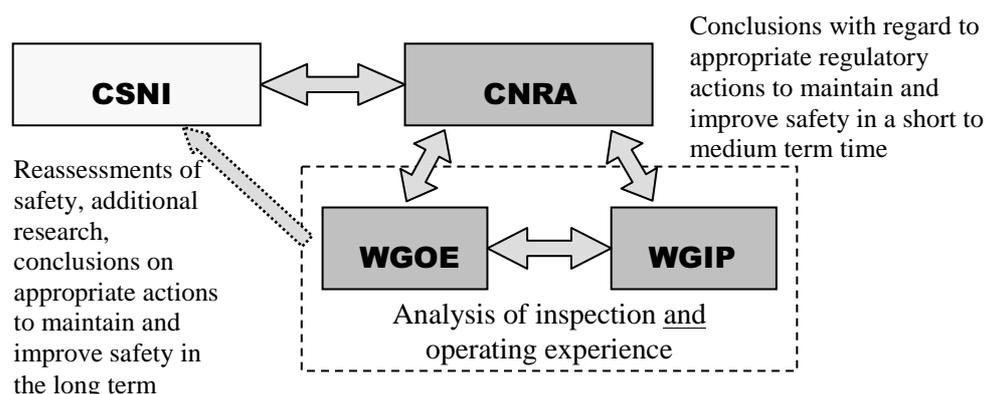
5. The CNRA current mandate in fact states: "In particular it (CNRA) shall review current practices and operating experiences with a view to disseminating lessons learnt."

organisations, as well as assessments of the effectiveness of various regulatory actions in preventing recurrence of certain types of events (see further below).

### 3.2 The CSNI Working Group on Operating Experience (WGOE)

It is clear to the Review Group that the CSNI Working Group on Operating Experience (WGOE) must continue to serve both the CSNI and the CNRA and receive guidance and feedback from both committees, at the same time recognising the different character of the work of the two committees. For the CSNI, analysis of operating experience is essential, for example, in order to improve methods and data used in safety assessments and to judge the need for additional research, e.g. into material degradation mechanisms. For the CNRA, analysis of operating experience is essential to discuss and judge the need for regulatory response in different timeframes and to assess the effectiveness of various regulatory actions in preventing recurrence of certain types of events.

While WGOE thus has to serve both the CSNI and the CNRA, the WGOE should belong clearly to one of the committees. In principle, it could be either of them. However, the Review Group has concluded that added-value to safety from analysis of operating experience could be more rapidly and effectively accomplished if the WGOE belonged to the CNRA, and was included in a communication and feedback loop as shown in the figure below.



The Review Group therefore recommends that:

- the Working Group on Operating Experience (WGOE) is organisationally moved from the CSNI to the CNRA;
- the WGOE mandate and working methods are reviewed and revised in co-operation with the CNRA and the CSNI, to reflect the responsibility of the WGOE to serve both committees, taking the different characters of their work into account;
- the membership of WGOE is reviewed to ensure the required mix of expert competence and a good balance between the CNRA and the CSNI member organisations;
- the CNRA promotes close co-operation between the WGOE and the WGIP on issues of common interest, which, for example, could be addressed in joint task forces, workshops or meetings;

- the CNRA and the CSNI member organisations, as well as the NEA Secretariat, ensure that resources are assigned to the work of the WGOE that are commensurate with its important tasks.

After a transfer of the WGOE to the CNRA, the information exchange process with the CSNI and its working groups could and should be at least as efficient as in recent years: the combined conclusions from operating and inspection experience could provide improved guidance on needs for reassessments of safety and safety analysis methods, as well as on needs for additional research. The added-value to safety should be considered in establishing priorities for further work. For example, within the CNRA it could become the basis for new working group tasks, new senior level task groups, specialised workshops, etc. In turn, the CSNI may need to initiate specific tasks in existing working groups, establish new research programmes or provide input on the current state of the art.

### **3.3 Working Group on Public Communication (WGPC)**

The Review Group notes that since its creation in 2001, the WGPC has established a well-functioning network for information exchange between regulators and has arranged several productive workshops. Based on experience gained so far, the CNRA has initiated a review aiming at further developing the mandate and future programme of work of the WGPC.

The Review Group welcomes this review and recommends that the CNRA ensures close co-operation with other NEA committees, mainly the RWMC and the CRPPH on cross-cutting issues such as:

- stakeholder involvement, both during normal operation and when expanding activities at existing sites or when licensing new nuclear sites;
- communication in abnormal situations (whether radioactive releases have occurred or not);
- use of different tools and approaches for communication with the public, including co-operation between communication specialists and technical specialists.

The issue of how regulatory authorities can earn and maintain public trust can be regarded as a common denominator for the whole field.

## **4. Interaction with other NEA committees**

### **4.1 The CSNI**

It is extremely important that the CNRA obtains, as a basis for its work, timely scientific and technical advice from the CSNI. This relates to all areas of CSNI expertise. Therefore the Review Group concludes that there remains a strong need for continued close interaction between the CNRA and the CSNI, in particular their bureaux, in the development of the two-year programmes of work, observing what the Review Group has recommended in Part I, Section 2.2 on selection of issues and setting of priorities. In the same way as in the Joint Strategic Plan [2], the programmes of work of the two Committees should demonstrate a shared understanding of key safety challenges and safety priorities.

The Review Group recommends that the CNRA and CSNI Bureaux set up a small joint Programme Advisory Group, made up by a few members of each of the two bureaux, to advise both committees on appropriate co-ordination of their programmes of work, and that the proposed

programmes of work are discussed at a joint bureau meeting before they are put to the two committees for approval. If such a joint Programme Advisory Group is established, the CSNI may wish to reconsider the need for its Programme Review Group (PRG).

#### 4.2 Other NEA committees

The Review Group concluded in Part I, Section 1 that there are no reasons for fundamental and wide-ranging changes in the role and mandate of the CNRA as approved by CNRA in December 2004. Obviously, this implies that the Review Group has found no reasons for a redistribution of tasks between the CNRA and the other NEA committees, namely the RWMC, CRPPH, NSC, NDC and the NLC.

The Review Group has, however, also concluded that good co-ordination and co-operation needs to be ensured between the CNRA and some of the other committees, notably the RWMC and its Regulatory Forum, as well as the CRPPH and to some extent the NDC,<sup>6</sup> for a number of cross-cutting issues in nuclear safety regulation, which have been exemplified in previous sections. The recommendation by the Review Group in Section 2.3 on periodic overviews of NEA work on nuclear safety regulation is intended to promote such co-ordination and co-operation.

In addition, the Review Group recommends that the CNRA chairperson, as a part of the preparation of the CNRA programme of work, consults with the chairpersons of the RWMC, the CRPPH and the NDC on suitable ways to co-ordinate such cross-cutting activities. Moreover, the regular reports given at the CNRA meetings on activities of regulatory interest in these committees should highlight such co-ordination areas and cross-cutting issues. Areas of regulatory activities that should receive particular attention at such co-ordination meetings include:

- fuel cycle installations of interest to many member organisations (such as fuel fabrication plants, intermediate storage of spent fuel, spent fuel encapsulation plants);
- decommissioning of various types of nuclear installations.

These recommendations by the Review Group are intended to emphasize the responsibility of the CNRA to ensure proper co-ordination of the programme of the Agency concerning the regulation, licensing and inspection of nuclear installations with regard to safety, as foreseen already in the CNRA mandate, without basically changing the responsibilities of other NEA standing committees in their respective fields. In this context, the Review Group welcomes the proposed amendment to the CNRA mandate which states: *“The Committee shall maintain an oversight of all NEA work that may impinge on the development of effective and efficient regulation.”*

Otherwise, the Review Group has not identified any need for further recommendations on the interaction between the CNRA and other NEA standing committees. The CNRA, as well as the Review Group, expects the CSNI to ensure the co-ordination with the NSC on scientific issues of possible regulatory interest. Finally, there is little, if any, need of co-ordination between the CNRA and the NLC, as long as the two committees do not fundamentally change the profiles of their programmes of work.

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6. NDC is for obvious reasons interested in the economic impact of many nuclear regulatory activities, both with regard to nuclear power plant safety and with regard to the management and disposal of spent fuel and nuclear waste.

## **5. Interaction with the IAEA and other international bodies**

### **5.1 *The IAEA***

The Review Group notes with regret that it seems impossible to conclude a formal MOU between the NEA and the IAEA on co-ordination and co-operation, for reasons outside the control of the two Secretariats. The Group recommends that:

- the NEA Secretariat continues its efforts to achieve good co-ordination with the IAEA on international conferences and other activities in nuclear safety regulation matters;
- the CNRA member organisations, through their participation in the IAEA work, continue to ensure that insights gained from NEA work are put to good use in the IAEA work, to avoid duplication and promote co-ordination.

### **5.2 *Other regulatory fora***

The Review Group notes that WENRA, in particular through its benchmarking projects, exercises considerable influence towards increased harmonisation of nuclear safety requirements within the EU. The Review Group concludes that there is no need for specific recommendations on CNRA – WENRA co-ordination as there is no duplication of work and the CNRA is kept well informed of the WENRA work. Almost all<sup>7</sup> WENRA organisations are also members or observers of the CNRA. The same conclusion has been reached with regard to some other international regulatory fora, such as INRA. However, the CNRA and the NEA have to consider the activities of these fora, especially when planning meetings and workshops.

### **5.3 *Industry organisations***

As it is generally recognised that the owner/operator of a nuclear power plant has the primary responsibility for safety, under the regulatory supervision of the CNRA member organisations, the Review Group finds it natural that the CNRA primarily seeks information exchange with international industry organisations representing owner/operators, organisations that also carry out solid technical work.

The Review Group recommends that the CNRA continues to work on developing an information exchange with appropriate licensee organisations, especially on the analysis of generic operating experience, including safety management at nuclear power plants, and on possibilities to improve the interaction between regulators and operators in ways that benefit safety.

Moreover, the Review Group notes that major utilities in Europe, including Russia, have co-operated extensively within the EUR project on developing extensive technical specifications, including safety specifications, for new reactors of evolutionary designs. The Review Group recommends that the CNRA continues to keep itself updated on EUR developments through appropriate information exchange with the EUR project, in addition to the information received from those CNRA member organisations now in the process of licensing new reactors.

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7. The only exceptions are Bulgaria, Lithuania and Romania.

## **6. Outreach to non-members of the NEA**

The Review Group is well aware of the outreach policy of the OECD with regard to non-member countries and its implementation in the NEA co-operation framework under the guidance of the NEA Steering Committee, where key elements are adherence to the NPT, mutual benefit, and observership in selected committees with periodic reviews and participation in co-operative research projects. The Review Group concludes that there is no need for additional, specific guidance to the CNRA in this respect, beyond noting that it would be in line with the OECD outreach policy if the CNRA from time to time considers if there are new candidates for observership that could be encouraged to join. At the same time the Review Group underlines the importance of observers actively participating in and supporting the CNRA activities.

## **7. CNRA internal working methods**

### ***7.1 The user perspective***

The Review Group recommends that all CNRA activities – committee and working group meetings, workshops, task forces and publications – are planned and run from the user's perspective, in order to produce the most useful output. To ensure successful application of such a user perspective, the Review Group moreover recommends that the CNRA performs systematic assessments of the usefulness of the CNRA output to member organisations, not least with respect to added-value to safety. As mentioned in Part I, Section 2.3, such assessments should be included in the periodic overviews of the NEA work on nuclear safety regulation. In making this recommendation, the Review Group is aware of the fact that the actual use of the CNRA output is highly dependent on its effective dissemination within the CNRA member organisations – something that is primarily the responsibility of the national delegates to the CNRA.

### ***7.2 Use of working groups, task forces and workshops***

The Review Group has noted that the CNRA has organised its work in a flexible way using a mix of working groups and task forces to prepare reports, presentations and discussions at committee meetings and workshops, in doing so, stretching available resources to the limit as discussed in Part I, Section 2.4 above. The Review Group has already presented its conclusions and recommendations on the working groups in Part I, Section 3. In addition, the Review Group recommends that the CNRA, with these resource limitations in mind:

- Continues to use task forces for specific objectives in terms of expected useful output and with specific time limits. Where appropriate, such task forces should include expertise from other parts of the NEA, notably the CSNI network, but also from industry.
- Continues to ensure appropriate communication with its working groups and task forces providing effective guidance and feedback.
- Continues to use qualified consultants where appropriate, to assist the Secretariat to merge and distil inputs from the CNRA member organisations into useful reports (but not to replace such inputs).
- Ensures that there is enough flexibility in the programme of work to address urgent issues that may emerge, e.g. being raised as the result of incidents or accidents.

### ***7.3 Regular and topical meetings, including Regulatory Forum meetings***

The Review Group concludes that a frequency of two committee meetings per year has proven useful over the years the CNRA has existed. The Review Group recommends that the CNRA:

- Ensures that each agenda item is prepared with an expected outcome and its use in focus, and that this is indicated in an annotated agenda distributed before the meeting.
- Continues to devote one of the meetings each year mainly to in-depth treatment of selected topics of high regulatory interest. Such topical meetings should end with tentative regulatory conclusions from the meeting made by the CNRA chair, assisted by the Secretariat.
- Assigns generous time each year to in-depth discussion of new operating and inspection experience based on reports from the WGIP and the WGOE. The discussions should avoid digging into the technical details of events and observations and focus on possible regulatory implications from a broad safety perspective as well as on any additional guidance to give to the two groups. When appropriate, these discussions should include national updates on lessons of special regulatory significance that have been learnt from recent events or inspections.
- Encourages that reports and presentations are distributed electronically well before meetings, so that oral presentations can be limited to main conclusions and recommendations, including suggested topics for discussions. Thereby, more time will be made available for in-depth discussions and drawing conclusions.
- Continues to schedule meetings “back-to-back” with the CSNI, to facilitate rapid information exchange and feedback. Joint sessions should be held as now when appropriate.
- Reviews the proper scope and frequency for the Regulatory Forum meetings that expect the wide participation of top level regulators. Intervals between these meetings should be chosen to ensure a good selection and preparation of topics and in consideration of the many other demands on top level regulators to participate in international meetings.

### ***7.4 Publications***

The Review Group concludes that CNRA activities are well documented, but that more stringency would be beneficial in the definition of the different types of reports and other documents that are produced as outputs of various CNRA activities.

The Group therefore recommends that the CNRA prepare a short guidance document defining the types of documents produced under the auspices of the CNRA and the type of peer reviews and the CNRA endorsements needed for each type. A simple approach could be that basically only two types of documents are issued (in addition to meeting records):

- “Green booklets” in a numbered series, consisting of reports, the contents of which have been carefully prepared, appropriately peer reviewed, and the publication endorsed by the CNRA in plenum. Such reports could be initiated by the CNRA or one of its working groups, with a clearly defined purpose from a user perspective. Green booklets should be available in both printed and electronic form.
- “Working documents” in separate, numbered series for the CNRA and each of its working groups. These series would consist of any documentation of activities that the CNRA and its working groups or task forces would find useful to have recorded in such a series. To save

time and costs, working documents would typically be available from the Secretariat only in electronic form and could consist of simple electronic compilations of presentations at meetings and workshops.

Moreover, easy localisation and downloading of CNRA documents over the Internet is a key factor from a user perspective.

The Review Group finally concludes that, unless the CNRA finds it justified to revisit an issue, there is no need for systematic updating of CNRA publications.

### **7.5 Knowledge management**

The Review Group welcomes the overview of past CNRA activities compiled by the Secretariat in the CNRA report *A Historical Perspective* [5]. This overview demonstrates the important role played by the CNRA in sharing knowledge among member organisations and the wealth of regulatory experience made available. Thus, the overview can serve as a valuable introduction to CNRA work for new delegates to the CNRA and its working groups.

Succession planning and transfer of knowledge and experience for staff in utilities, TSOs, and regulatory bodies has been identified by the CNRA as a key regulatory challenge as indicated in the CSNI/CNRA Joint Strategic Plan. The Review Group recommends that the CNRA pays due attention to its own internal knowledge transfer issues, both when delegates to the CNRA and its working groups are replaced and when there are changes in the Secretariat. Indeed, in a time of wide-ranging changes in nuclear infrastructure in many countries, both on the nuclear industry side and on the research side, regulatory bodies tend to be more stable as guardians of safety lessons learnt over time, and the CNRA could and should play an important role as a “collective professional memory” in this respect.

## **PART II. BACKGROUND INFORMATION AND OBSERVATIONS**

This part of the report consists of a compilation of background information and observations assembled by the Review Group and used in the performance of its review. The texts have been reviewed by the Group as a whole, but there may be some overlap and repetition between chapters and sections. Nevertheless, for reasons of transparency, the Review Group has found it appropriate to include these sections in their present form as background documentation for Part I. In case of any perceived inconsistencies between Part I and Part II, the Review Group underlines that it is Part I that represents the final considered opinion of the Group.

### **1. The present situation of the CNRA**

#### ***1.1 Structure and working environment***

##### ***1.1.1 The CNRA within the NEA***

The CNRA is one of the seven standing committees of the NEA and is responsible for the program of the Agency concerning the regulation, licensing and inspection of nuclear installations with regard to safety. Up to now, this role has been, in conjunction with the CSNI, to assist member countries in ensuring high standards of safety in the use of nuclear energy, by developing effective and efficient regulation and oversight of nuclear installations, and by maintaining and advancing the scientific and technological knowledge base. A comprehensive overview of the activities of the CNRA since its formation can be found in the CNRA report *A Historical Perspective* [5].

The CNRA chairperson takes part in yearly meetings of the committee chairs and intermittently makes reports to the NEA Steering Committee. Up to the recent past, the standing committees worked somewhat in parallel, giving rise to the possibility of overlaps on major issues which were clearly cross-cutting. The changing environment of the last few years is leading to more areas in which committees will need to work more closely. The interface issues between the CNRA and the other Standing Committees is discussed in detail later in this report.

With regard to setting the overall strategy of the Agency concerning nuclear safety, the Review Group has observed that the formal role of the CNRA, as well as that of the other the standing committees role is limited. Nevertheless, the CNRA and the CSNI, working closely together, have contributed extensively to the development of a common outlook on nuclear safety among NEA member countries, in particular with regard to reactor safety. In addition, the RWMC and the CRPPH have addressed regulatory issues in their respective fields. The Review Group has also recognised that the role of governments with regard to nuclear power has changed considerably over the past decades in most NEA countries, with more emphasis on safety regulation and less emphasis on support to reactor technology development. These aspects need to be reflected in the further development of the role of the CNRA in the NEA framework, and in the interaction between the CNRA and the NEA Steering Committee.

### 1.1.2 CNRA structure and organisation

Prior to its formation as a standing committee in 1989, the CNRA was part of the CSNI as its sub-committee on licensing. The sub-committee normally met once or twice a year, holding specialist meetings and setting up small task oriented groups when appropriate.

The structure of the present CNRA includes the main committee, an elected Bureau, Working Groups and Senior Level Task Groups.

#### *Main Committee*

Since its formation in 1989, the CNRA has held an annual meeting every autumn. Each summer the CNRA convenes a more focused meeting relating to a regulatory issue of concern. Historically, these have taken one of two approaches: in-depth discussions, which are focused on specific issues of great interest in a given moment (special issues meeting) or, more recently, high-level international fora related to nuclear regulatory challenges.

#### *CNRA Bureau*

The Bureau of the CNRA plays a key role in planning CNRA activities. The size of the CNRA Bureau has changed over the last 15 years, from three (3) members (1989 to 1996) to five (5) members in 1998 and seven (7) in 2004. The Bureau has one full meeting (separate from other meetings) and one brief meeting (during the annual meeting) per year.

#### *Working Groups*

To address issues on a more continuous basis, the CNRA has established two working groups, the Working Group on Inspection Practices (WGIP) set up in 1990 and the Working Group on Public Communication (WGPC) in 2001.

*The Working Group on Inspection Practices:* The Working Group on Inspection Practices (WGIP) was formed in 1990 with the mandate "... to concentrate on the conduct of inspections and how the effectiveness of inspections could be evaluated...". In addition to the exchange of information on inspection practices, the WGIP prepares reports, develops commendable practices and holds an international workshop on nuclear inspection practices every 2 years. The WGIP meets twice a year in a member country. This concept of meeting in a member country provides inspectors the opportunity to receive first-hand information on specific national inspection activities and programmes and for involving other managers and staff from the host organisation.

*The Working Group on Public Communication:* The original mandate of the group is to facilitate the exchange of information, news, documents, experiences and practices among nuclear regulatory organisation communicators. It also aims exchanging views regarding the policies of nuclear regulatory organisations in the area of public communication of a regulatory nature, and identifies ways of promoting efficient collaboration. The WGPC meets once a year, either in Paris or a member country, and holds workshops when appropriate.

### *Senior Level Task Groups*

From time to time, the CNRA has created senior level task groups on specific regulatory issues. These groups, which usually work for a term of 1 to 1½ years, meeting two or three times, produce what are recognised as the CNRA green booklets.

### *Other*

In addition to the above, CNRA will at times organise a small group to look at the programme of work in general, an emerging regulatory issue, or will organise or co-sponsor a workshop or conference with the other NEA standing committees or with other international organisations.

## **1.2 Working methods and products**

### *1.2.1 Working methods*

The work of the Committee is wide ranging, identifying and assessing emerging regulatory issues through the continuing exchange of information, developing consensus views, and by performing specific tasks by the committee itself, its working groups or special expert groups.

The exchange of information remains one of the main purposes of the CNRA. National reports are prepared by the member countries for each meeting, circulated and discussed via a round table discussion. Changes over the past few years have been made to enhance the round table discussions held at each meeting. Instead of, as in the past, having one general round table to review national reports, the agenda item has been divided into three parts: review of recent operating experience (presented by the CSNI Working Group on Operating Experience), selected events of particular regulatory significance in member countries, and a round table of national reports.

Another process used is to have an in-depth discussion. In this case the issue is prepared by a small task group and presented to the CNRA, which is followed by discussion among the members and either a satisfactory outcome is reached or further study is recommended. Where there is strong interest, this process can sometimes be turned into a workshop.

The main working method of CNRA and its working and senior level task groups is performed via a task-oriented approach. The most common way tasks are completed is to collect information, normally either by actual exchange of information or through a survey. The information is then compiled, analysed and synthesised to develop good regulatory practices and documented into a CNRA report.

### *1.2.2 Products*

The shared knowledge and understanding achieved among the participants in the CNRA meetings can be seen as one of the main results of CNRA activities. These results are also recorded in various documents and reports produced by the CNRA. All reports are now made available and are downloadable from the NEA web site and provided on CD-ROM (when appropriate). All CNRA

documents are distributed to all members and, depending upon the specific issue, also to other NEA Committees, as deemed appropriate. CNRA products can be generally categorised as follows:

#### *CNRA green booklets*

The green booklet series provide a consensus of senior level regulatory experts in the NEA member countries on the basic concepts of a specific regulatory issue (e.g. safety culture, de-regulation, decision making, etc.) in a concise booklet. The CNRA began publishing the green booklet series in the late 1990s and they have received widespread distribution.

#### *CNRA reports*

Reports generally are produced on various regulatory topics by the working groups or the CNRA and provide a state-of-the-art or technical consensus opinion.

#### *CNRA workshop proceedings*

Workshop proceedings are produced following a conference or workshop and normally contain a summary of the results and findings and the papers presented.

#### *CNRA meeting documents*

Meeting documents consist of the summary record for each meeting, national reports produced by each country and various papers and presentation circulated on the agenda topics.

#### *Usefulness of reports and other documents*

The Review Group noted that although no study or review has been performed on past reports as to their current validity, it does not seem to be an overriding concern to members. Several attempts have been made to measure the usefulness of CNRA products (e.g. surveys, feedback requests, etc.) but these have been mostly unsuccessful today. However, the views expressed by CNRA members at meetings are that most are useful.

The CNRA has recognised that it is difficult to judge whether the dissemination of products is adequate and to measure how useful they are, and as a result has agreed to add a round table discussion at future meetings on how products are used.

### **1.3 Priorities and topics**

For the CNRA, issues are derived from surveys of members, through the exchanges of information at meetings, by evaluation of recent events or through the work of senior level task groups formulating future nuclear regulatory challenges. Work is carried out following discussions by the committee and/or the CNRA Bureau and decided upon by consensus. The working groups issues are generated from both a top-down and bottom-up approach, approved by consensus of the committee. By this process, and the fact that member organisations voluntarily assign experts to various groups and task forces, it is ensured that CNRA activities reflect needs and interests which are widely shared by the CNRA members.

The types of issues have evolved over the last 15 years from mostly technical aspects to more policy oriented debates. This can be seen as closely following the experience seen in Member

countries over this period. Most of the work performed during the last 10 years was formulated from the work of a special task group which produced the report on *Future Nuclear Regulatory Challenges* [4]. The insights gained from this work provided an overview of the challenges faced by regulatory authorities that was much appreciated by the CNRA members. The CNRA has maintained and discussed this listing of challenges as the basis for developing its programme of work.

During the past year, a Joint Strategic Plan [2] which lays out the basis for challenges over the coming five years has been developed in co-operation with the CSNI. This new plan, which was approved by both CNRA and CSNI in December 2004, recognises the current status of the nuclear power industry and, in particular, the main challenges that both regulators and safety researchers will face in the next five years. Although there exists a trend to streamline resources, the needs continue to be high: as the reactor fleet ages, new challenges appear that need to be addressed.

Additionally, the new joint strategic plan lists the generic strategic areas such as:

- ensuring an effective exchange of safety relevant information and developing common understandings and approaches on current safety issues;
- identifying generic issues and trends;
- assisting member countries in the resolution of safety issues;
- addressing safety issues associated with new technologies and reactor designs;
- helping maintain an adequate level of capability and competence necessary to ensure the safety of existing and future nuclear facilities;
- CNRA and CSNI response to, and helping obtain better understanding of, national regulatory requirements, encouraging harmonisation of regulatory standards where appropriate; and
- the enhancement of the efficiency and effectiveness of the regulatory process.

## **1.4 Resources**

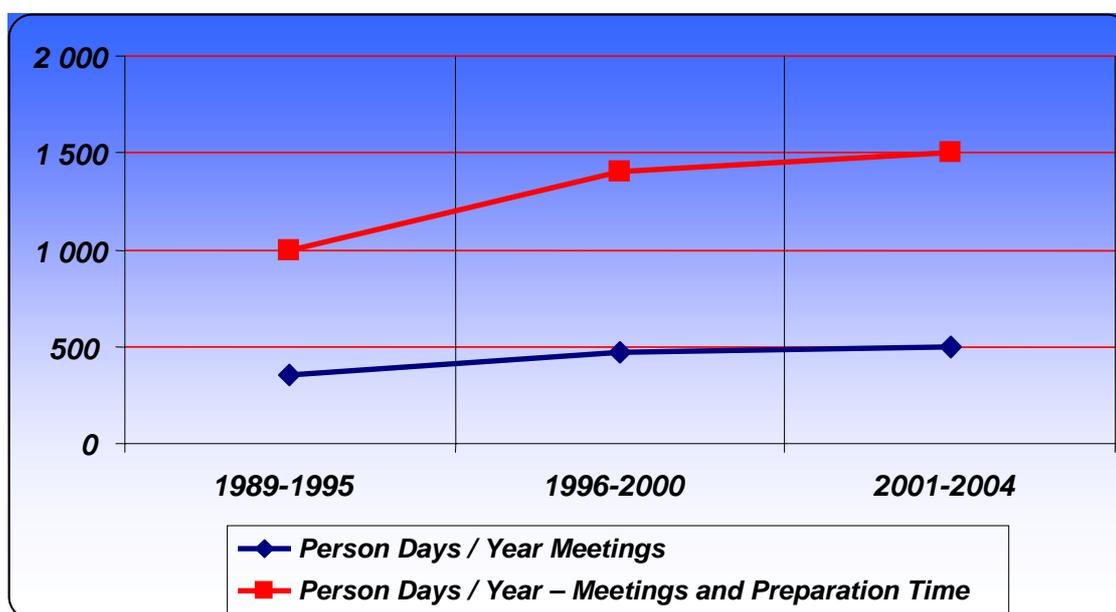
### **1.4.1 Member countries resources**

The resources spent by the member countries are difficult to calculate, but can be partially assessed by looking at the number of various types of meetings held each year and the number of participants. The chart below depicts the general trend of resources being expended by member countries in the CNRA meetings over the past 15 years. (Note: the amount of person-days/year meetings was tripled to account for person-days/year for travel and preparation).<sup>8</sup> It is important to note that it does not include participation at workshops, international fora, Bureau meetings and a few other special cases. Accordingly, the reader is cautioned that trying to make a comparison with the numbers used in this chart can be very misleading. However, it can be seen that there has been a clear trend over the past 15 years (e.g. the number of yearly meetings held has increased from approximately 4 to 6 in the first 5 years to 10 to 15 today) of increasing amounts of resources

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8. There is no precise measure as to the amount of time each participant uses to prepare for (and travel to and from) meetings, so a multiplication factor of 3 was chosen as a constant for everyone.

expended by the member countries. This trend correlates very closely with changes in the CNRA Programme of Work over the past years.



Briefly the chart depicts the following trends:

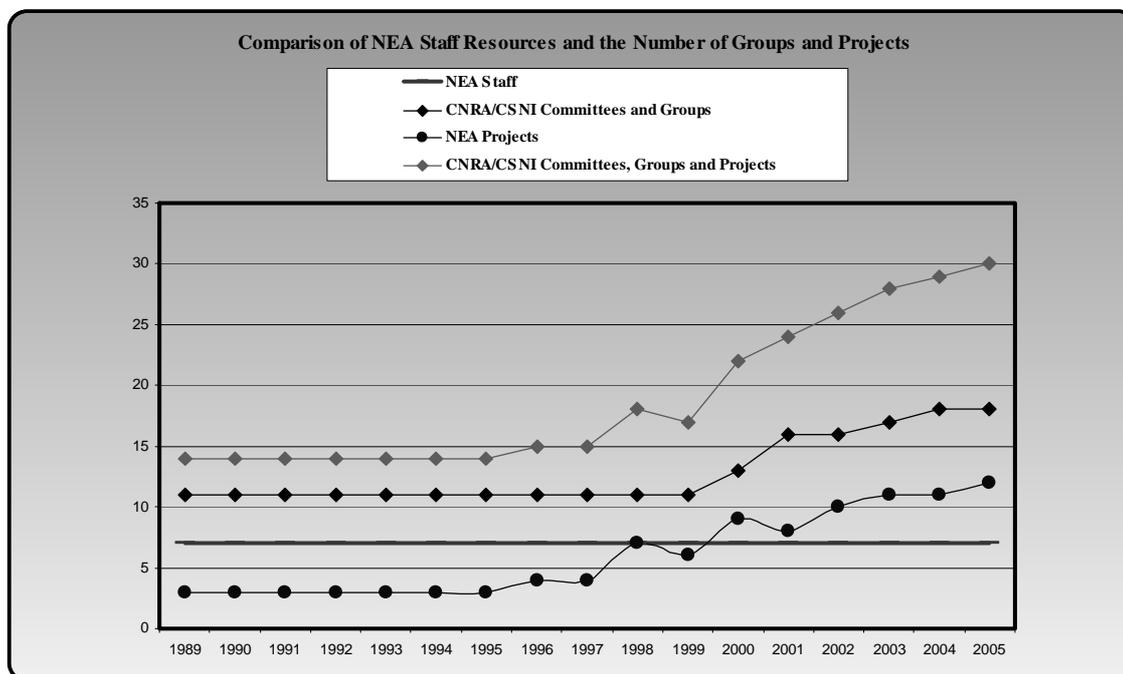
- The first period, between 1989 and 1995, shows a steady growth of participation, which reflects the programme of work that mainly consisted of the CNRA annual meetings, special issues meetings and the WGIP meetings. The growth can mainly be attributed to the interest of the technical issues being discussed (advanced reactors, periodic safety review, use of PSA, etc.) and the increase in the NEA membership during that period.
- The growth during the second period, 1996 to 2000 coincides with the evolution of the senior level task groups, the beginning of international fora and the increase in the NEA membership.
- The levelling off during the third period, 2001 to the present, can be attributed to several reasons. While the CNRA added a new working group (WGPC), there has been a corresponding decrease in the number of participants from each country (possibly due to decreasing resources)

#### 1.4.2 Secretariat resources

Although it is difficult to assess the amount of resources spent by the NEA Secretariat, it is estimated that the Secretariat resources assigned to the CNRA have remained practically constant during the past 15 years. The chart below provides the average size of the NEA staff<sup>9</sup> and number of committees, working groups, experts groups, projects, etc. administered by the NEA Safety Division for the CNRA and the CSNI. One important element that this table does not show is the large increase in yearly meetings resulting from the increasing number of groups and projects, which

9. Professional staff has averaged 6 to 7 persons including cost free consultants. It should also be noted that support to the professional staff was reduced from 4 to 3 in the mid 1990s.

correspondingly affects the resources of the Secretariat and the member countries. For example, there are now 12 OECD projects underway, each of which holds at least 1 or 2 meetings a year.



Based on the information and the discussions, several observations were made by the Review Group as follows:

- The increased number of meetings has been matched by a corresponding increase in the number of documents produced. However, the resources of the Secretariat have not correspondingly increased during this period, keeping in mind that modern information technology only has facilitated the purely technical production and distributions of drafts, etc.
- There is evidence which provides some indication of the types changes that have taken place. For example, while the collection of information is still performed in the same way, there has been a noticeable shift in how reports are completed. In the earlier years it was not uncommon for a member country to take the lead in a task or special issues meeting, and, in addition, provide special consultants to assist in the work. This has changed quite significantly in the last 10 years, and now, most of the organisational work and the compilation and editing of results has to be done by the Secretariat.
- The work of the Secretariat has been supplemented, when funds have been available, by qualified consultants hired by the NEA. They have provided valuable assistance in preparing meetings and merging and distilling input from the CNRA member organisations into useful reports (without replacing such input).

## **1.5 Interface with others**

### **1.5.1 Internal**

The CNRA has worked closely with the CSNI over the years, for example by asking the CSNI experts to help by preparing special issues meetings and inviting the CSNI members to attend such meetings. This effort has been increased in the past year by developing a Joint Strategic Plan and holding some joint sessions. As in the past, the two committees report to each other at their respective meetings each year, continue to jointly sponsor workshops of mutual interest and now have held several joint fora (e.g. “Role of Research in a Regulatory Context”) and are initiating joint in-depth discussions on specific issues of regulatory importance. In addition the CNRA has, from time to time, made specific requests of the CSNI for technical information, although obtaining answers to these questions has not always been successful. The CNRA receives yearly reports from the RWMC and the CRPPH on related activities, and has jointly sponsored several workshops.

Changes in the environment have been evolving over the past few years in which regulators are beginning to see the need to pay more attention to the work being performed in other parts of the NEA, and to increase co-operation on cross-cutting activities. There have been a few (positive and negative) examples in the last several years in which the CNRA has had a vested interest in the work of other committees. For example, two successful joint workshops have been held with the CSNI, the RWMC, the CRPPH on decommissioning, and the CNRA has contributed to the ongoing revision of ICRP recommendations. Recently a proposed activity by the NDC, now renamed Licensing Processes and Nuclear Energy in the Competitive Electricity Market, received numerous comments from the CNRA members.

### **1.5.2 External**

Co-operation with other international organisations (e.g. IAEA, WANO, EC, WENRA, INRA, etc.) has increased slightly during the last few years. Some examples of good co-operation over the past few years include: Y2K effort with WANO, joint workshops with the IAEA on safety management, NEA-WANO Forum in 2002, presentations of WENRA harmonisation work at the CNRA meetings, etc. The fact that the CNRA members are also members of, or participants in, some or all of these other organisations (other than WANO) helps avoiding duplication between the different organisations. The co-operation and co-ordination with external organisations is further discussed in Part II, Section 3.

## **2. Lessons learnt**

During the discussions of the Review Group, the members looked at the past performance of the CNRA and the lessons learnt, both positive and negative. The group reviewed various aspects of CNRA work such as structure and working environment, working methods and products, priorities and topics, and interface with others. In addition, the group reflected on the current situation versus the conclusions and recommendations made in the previous review in 1997 [6].

One of the main lessons learnt, and possibly one of the main benefits to the CNRA members, is the “regulatory network” created between members during meetings and throughout the year. Having a forum where members meet and discuss directly with one another twice a year, has proven invaluable in providing CNRA members with easily accessible contacts in other countries to discuss emerging issues (i.e. urgent regulatory problems, sensitive issues, etc.) on a bilateral basis.

## **2.1 Structure and working environment**

### **2.1.1 The CNRA**

The structure consisting of the main committee, a bureau, working groups and senior level task groups has been the same since the committee was created. The previous review made several minor recommendations concerning the organisation and operation, although the review was satisfied with the structure. In fact one recommended a change in the Bureau size from three to four or five, which was recently changed to seven members.

Regarding the level of participation, the 1997 review noted that the effectiveness of the CNRA depends directly upon the level of participation by the member countries. It recommended that meetings should be attended by senior level regulators who are direct decision makers and who control resources to support the CNRA discussions. The level of participation recommended in the previous review should remain as such. Further, experience has also shown that the same level of participation is required by the senior level task groups in preparing the Green Booklet series.

The relationship between the Committee and its working groups has always been close and the top-down and bottom-up approaches continue to work. The major change in the last few years has been the addition of the Working Group on Public Communication. The work of the senior level task groups is normally managed by a highly regarded consultant and many of the members are CNRA members.

The Review Group observed that the enlargement of the CNRA Bureau was probably the most beneficial change made from the recommendations in the previous review. First, it provided the Committee with a standing advisory group to guide the programme of work. Second, it ensured that there was sufficient support to carry out the work and third, it provided a better corporate memory of what has already been accomplished and therefore helped reduce the chances for duplication in the Committee's work.

### **2.1.2 Regulatory Forum meetings**

The Review Group noted that the Regulatory Forum meetings have provided a unique environment in which the NEA has been able to attract head regulators to address major policy issues. With one or two exceptions these Regulatory Forum meetings have been successful.

Generally, the Group noted that these meetings need to be timely and have a clear objective and a defined outcome so that they bring added value to the participants and provide them with useful information.

### **2.1.3 Working groups, senior level expert groups and workshops**

The two working groups, on inspection practices (WGIP) and on public communication (WGPC), have provided a needed input to the CNRA and also serve as unique international groups for these experts (e.g. WGIP provides the only international forum for nuclear inspectors). The work of the senior level task groups under guidance from an expert consultant has been both highly beneficial in providing timely reports that are useful for regulators, as well as being very efficient.

The Review Group noted that even with the close relationship between the Committee and the working groups, success requires constant monitoring and overseeing of the work. Additional concerns can also develop in determining the group membership (e.g. continuity needs, requirements to educate other staff internationally, resources needed, etc.). Therefore, it has to be ensured that proper attention is provided at an adequate level by each national organisation.

*Working Group on Inspection Practices* – At recent meetings, both the CNRA and the Bureau agreed that the WGIP should expand the concept from a working group on inspection practices to cover an integrated assessment overview process (i.e. inspection results, reviews, reports, indicators, etc.). It also noted that the group should also establish closer ties with the Working Group on Operating Experience (WGOE) and consider appropriate measures to respond to operating events when requested by the CNRA. This will require a new mandate and possibly a change in name.

*Working Group on Public Communication* – As a result of a major workshop last year, the WGPC is currently reviewing its mandate to reassess its main lines of work.

*Senior level task groups* – The Review Group noted that these groups have been very successful, and considers that the CNRA should continue to use them for specific objectives in terms of expected useful output, and with specific time limits.

*Workshops* – The Review Group observed that, as with the Regulatory Forum meetings, the success of workshops is very dependent on the topic being addressed and the timing. It is also essential that members provide support in developing and planning workshops. For example, the workshops on Y2K, Digital I&C, and Assuring Nuclear Safety Competence, were well planned, well attended and successful. Others, such as the recent one on Safety Management and the Effectiveness of Inspections, were well attended and successful, but required a lot more resources within the Secretariat and hence were more difficult to plan.

## **2.2 Working methods and products**

### **2.2.1 Exchange of information**

The reformulated agenda has enabled the CNRA to have a more efficient exchange of information. Operating experience is receiving (as in the most recent meeting) additional needed attention and the agenda ensures that significant regulatory developments in member countries are provided with adequate time for discussion, which sometimes was lost (due to time constraints) in previous meetings. The results of the exchange of information continue to provide the CNRA with pertinent information, which has contributed to the members' knowledge or to the CNRA programme of work. There are several examples of this such as: PAKS 2 incident, security issues, UK Licence condition 36, etc.

However, it was noted that, due to the amount of time available, a full round table for national reports is rarely performed, and when it is held, there is little consistency in the way countries report. Although the CNRA has strived to have this discussion focus on recent regulatory issues and events, in many cases countries provide a more generic review of changes that have taken place. In addition, efforts to have reports in advance of the meeting have not been fully successful.

The exchange of information cannot be limited to the one performed at the "official meetings". Contacts between members allow for more "unofficial contacts" for specific needs of the different members.

The 1997 review noted that the usefulness of presentations is directly related to the amount of preparation and co-ordination that has been done beforehand. It was agreed that to make the regulatory issue presentations useful will require several member countries to make a real commitment of resources to support the CNRA. There has been no change in this situation. During the past few years, there have been some very good presentations (e.g. human performance) and less successful ones (e.g. advanced reactors). The basic criteria previously noted, in selecting activities, need to be applied when deciding on an in-depth discussion.

### 2.2.2 *Products*

The Review Group noted that the activities of the CNRA and its working groups are well documented and their reports provide useful information to regulators. It added that without adequate feedback, it is difficult to judge whether dissemination of products is adequate. The CNRA has agreed to provide information at future meetings on how products are actually used in the member countries (the WGIP has been doing this for a few years).

In particular, the green booklet series has provided members with short high level reports, which have been useful in providing information to decision makers and as training material to new regulators. The Review Group also noted that the recently issued report on the CNRA *A Historical Perspective* (1989-2004) [5] provides an overview of the work performed by the CNRA, which could be considered as a good primer for new members.

### 2.3 *Priorities and topics*

As previously noted, the report on Future Nuclear Regulatory Challenges [4] has provided the basic “road map” for the programme of work over the last few years and as already mentioned, the update of the main challenges listed in the new joint strategic plan will provide a revised “road map”.

As recognised at the 2001 Forum, one of the key developments in the last few years has been a significant transfer in how regulators are utilising research. While national differences exist in the way research is accomplished, there is an international perspective on the necessity to co-ordinate the work of regulatory authorities, research organisation and the nuclear industry to sustain a high level nuclear safety.

One of the key recommendations from the last review centred on the need to review lessons learnt from operational experience. The Committee has been receiving better inputs from the CSNI/WGOE in this area, and at its recent meeting has noted not only the importance of this issue, and the need for better oversight in this area, but also the need for close co-operation between the WGOE and the WGIP on issues of common interest: both groups should have safety lessons learnt from operating experience in focus, although working from somewhat different perspectives (events and inspection observations).

While the topics being covered over the past few years have been relevant and useful to the member countries, it is unclear as to whether the Committee has prioritised its work properly, especially concerning the balance between technical and policy issues. Part of the reason for this is that, unsurprisingly, in some areas there is no clear consensus. For example, some member countries are placing a lot of emphasis on risk informed methods, while others are still primarily deterministic based. The Review Group recognises that, following the shift of topics from technical to policy issues,

national differences may become more obvious, and slow the process of achieving consensus. The setting of priorities for the CNRA work is further discussed in Part II, Section 4.

#### ***2.4 Volume of work and resources***

In general, the Review Group observed that the amount of work and the number of meetings taking place are commensurate with both the current needs and outputs of the Committee. However it did note that the volume of CNRA work over the past decade has increased to such an extent that the available resources are now stretched to the limit, both at the NEA Secretariat and in the form of efforts from member organisation experts. While this stretching of resources has not affected the overall quality of the CNRA products, there are clear signs that the overall effectiveness and efficiency is being affected. Over the past several years, several reports have been either delayed or cancelled, proceedings from several fora were never issued, and short cuts are being taken in preparing meeting summaries, etc. As such, in order for the Committee to remain efficient and effective, it is important that adequate and realistic priorities are established to ensure that the most important safety issues are handled both efficiently and effectively within the resources available.

#### ***2.5 Interface with other NEA committees***

While the CNRA has worked closely with the CSNI over the years, and this effort has increased in recent years, there are still some communication gaps in each others perception of priorities, and hence in drawing matters to clear conclusions to the benefit of both committees. Thus, requests from the CNRA to the CSNI need to be followed up carefully to ensure response in a timely manner.

While the CNRA has been receiving yearly reports from the RWMC and the CRPPH on related activities, and has jointly sponsored several workshops, the goal established in the previous review, of closer relationships, has not been fully achieved, although more progress has been made with the CRPPH. The recent experience with the NDC has also shown the need to improve the communications and interactions between the NEA standing committees on cross-cutting issues related to the regulation of nuclear safety. The ultimate responsibility to ensure proper co-ordination of the programme of the Agency concerning the regulation, licensing and inspection of nuclear installations with regard to safety clearly rests with the CNRA, as stated in the original CNRA mandate. However this responsibility needs to be exercised more clearly and effectively, without basically affecting the responsibilities of the other NEA standing committees in their respective fields. In this context, the Review Group noted and endorses the new CNRA mandate which states:

*“The Committee shall maintain an oversight of all NEA work that may impinge on the development of effective and efficient regulation.”*

### **3. The international nuclear regulatory arena**

#### ***3.1 General observations***

Since 1989, when the CNRA was formed, profound developments have taken place in the international nuclear regulatory arena, all working towards increased global convergence of nuclear safety standards and regulatory oversight. As a part of these developments, the CNRA has been able to welcome several new members and observers. Thus, the CNRA member organisations, including

observers,<sup>10</sup> today regulate close to 90% of the operating nuclear power reactors in the world.<sup>11</sup> This chapter tries to provide an overview of these developments. As a general observation, the Review Group has found that the CNRA has managed to maintain its standing as a key international forum for professional exchange among nuclear regulators, defining its role and developing its activities in such a way that they are complementary to rather than duplicating activities in other international fora.

In the past 10 years, a number of new regulatory fora have been established such as the International Nuclear Regulators Association (INRA), the Western European Nuclear Regulators Associations (WENRA), the VVER Regulators Forum, etc. The interactions between the CNRA and these other organisations have been based on the exchange of information on specific issues of joint interest.

Most CNRA members are involved either directly or through their organisation with one or the other of these organisations. Therefore, there has been good co-operation and no duplication of work. Because of these relationships, the Review Group sees no need to change the current situation in regard to work being performed. However, it did note that the number of such organisations holding numerous high level workshops and conferences every year, taxes the resources of all organisations and needs to be carefully considered when developing CNRA's work plan.

### **3.2 *European Union***

There are presently some 160 nuclear power reactors operating within the enlarged European Union, including the remaining candidate countries<sup>12</sup> and Switzerland. Over the past decade, regulatory co-operation within the EU has developed considerably, mainly through WENRA (formed in 1999) but also through the Working Party on Atomic Questions of the EU Council of Ministers that evaluated nuclear safety in candidate countries as a part of the formal enlargement process. Also, several countries are actively working to identify, and obtain approval for, solutions for the final disposal of spent fuel that will not be reprocessed, and the different kinds of radioactive wastes.

In connection with the enlargement of the Union, the European Commission tabled proposals for binding legal instruments (EU directives) addressing the safety of nuclear installations and of spent fuel and waste management. In May 2004, the EU Council of Ministers, after thorough examination, decided not to accept the proposed texts and recommended further actions to strengthen co-operation with WENRA on the one hand and to facilitate an exchange of information between EU Member States on their participation in, and contribution to, the IAEA and the NEA on the other hand. This work is now proceeding under the auspices of the EU Working Party on Atomic Questions. Renewed initiatives from the European Commission on legal instruments can be expected in the future, even if it is not clear what the outcome may be. In any case, the role of national regulatory organisations will remain a pivotal one.

Meanwhile, WENRA continues its efforts to harmonise European safety regulatory requirements, both for existing nuclear reactors and for spent fuel and waste management: the objectives are to agree upon common safety reference levels. Final conclusions are expected by the end of 2005. WENRA members are committed to put their national practices in conformity with the common safety reference levels before 2010, along action plans to be presented before the end of 2006.

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10. Russian Federation and Slovenia.

11. IAEA Power Reactor Information System (PRIS) as per 17/12/2004.

12. Bulgaria and Romania.

Europe's main nuclear electricity producers are continuing the development of the European Utilities Requirements (EUR). The Russian operator, *Rosenergoatom*, joined the EUR organisation in 2003. The current C version of the EUR is now fully usable. The D version, which will in particular aim at covering foreseeable developments in the regulatory and industrial context over the next five to ten years, should be available in 2007. The main directions of work of the EUR organisation are:

- examination of WENRA's first report on harmonisation for existing reactors issued in March 2003: EUR conclusions have been forwarded to WENRA at the end of 2003;
- development of a risk-informed approach of the EUR;
- assessment of Westinghouse's AP 1000 and Russia's VVER AES 92 projects.

The regulatory activities concerning the European Pressurised Water Reactor (EPR) are continuing, both in Finland and in France. It is worth noting that about 80% of the current EUR technical specifications were used for the French bid for Finland's fifth reactor, Olkiluoto 3. On 17 February 2005, the Finnish Government granted a construction permit for Olkiluoto 3, based on a safety review performed by STUK. In France, the ASN, on behalf of the Ministers in charge of nuclear safety, issued in September 2004 an EPR safety option letter, which is the French equivalent to a preliminary design approval. Also, the Finnish and French regulators are closely co-operating and exchanging information on their respective licensing requirements.

### 3.3 *Asian sphere of the NEA*

Japan presently operates 54 nuclear power reactors and the Republic of Korea 19.

*Japan* – Based on the experience of a number of events that have occurred within the Japanese nuclear industry, significant improvements are on the way, especially in the area of licensees' safety activities. While this is principally to foster the initiatives of the licensees, the regulatory bodies are amending the legislation to improve licensees' activities by introducing quality assurance and its monitoring systems, voluntary inspection framework, integrity assessment systems and so on. Further, as the basis for ensuring safety, various activities to enhance safety culture will be conducted. As a part of this activity, an evaluation system is being studied with reference to IAEA ASCOT Guidelines, ISO-9001, etc.

Comprehensive safety goals covering not only power reactors but also fuel cycle facilities, transportation of radioactive materials, etc., are being discussed by the Nuclear Safety Commission. An interim report has already been published, and work is going on to develop the ideas further. Risk informed regulation is being considered for siting, design, construction, operation and decommissioning of various nuclear facilities and activities. Considering the maturity of risk assessment technology, the programmes of regulatory periodic inspection and licensees' voluntary inspection are the highest priorities at present. A reliability database as well as methodology specification is being developed with the cooperation of professional societies.

*Korea* – Korea is currently working to update existing regulations, for example, ICRP 60 as well as periodic safety review, were incorporated in the legal system, which will also require the use of PSA information. Since 2002 there has been a plan to develop ways in which regulators can use risk information aimed at setting out the basis for its necessity, objectives, direction and principles. In relation to the public communication, "Nuclear Safety Day" and "Nuclear Safety Alert Day" have been established. Special inspections and lectures are being conducted, where a unique activity called

“socio-drama” has been well-received, and which is proving useful as a means of spreading awareness on the importance of nuclear safety culture.

### **3.4 American sphere of the NEA**

In the American sphere, there are presently close to 130 operating nuclear power reactors as follows:

- Mexico: 2 Power Reactors Operating.
- United States: 104 NPPs in operation.
- Canada: 18 NPPs are operating, 4 have been shutdown and 3 have been decommissioned.

Mexico produces 5% of its electricity from nuclear power reactors, the United States produces 20% and Canada produces 12%.

In the United States, four designs have been certified by the NRC under 10 CFR52: the ABWR (GE), CE 80+ (W), AP 600 (W) and the AP1000 (W). Pre-Application reviews are in process or expected to commence in the near future for the following designs: ACR-700 (AECL), ESBWR (GE), IRIS (W), GT-MHR (GA), PBMR (PBMR Pty) and the EPR (Framatome). It is anticipated that almost all of the NPPs in the United States will apply to extend their operating licenses from 40 to 60 years. A number of such extensions have already been granted. Proposals for construction and operation of new plants are expected in the not too distant future.

### **3.5 Convention on Nuclear Safety and Joint Convention**

The *Convention on Nuclear Safety* entered into force on 24 October 1996. As of 3 September 2003, there were 65 signatories to the Convention and 55 contracting parties, covering more than 95% of the civil nuclear power plants in the world. The aim of the Convention is to legally commit participating States operating civil land-based nuclear power plants to maintain a high level of safety largely by applying the principles contained in the IAEA Safety Fundamentals document “The Safety of Nuclear Installations”. The legally binding obligations of the contracting parties include establishing and maintaining a strong and independent regulatory regime with respect to safety. Experience so far has shown that the organisation and performance of the regulatory regimes of contracting parties has been given much attention in the peer review process under the Convention, both in the “self-assessments” presented in the national reports and in the following review discussions. Thus it can be said that the Convention, as intended, has functioned as a vehicle for worldwide promotion of good regulatory principles and practices. The CNRA member organisations are deeply involved in the review process, often making use of experience with key regulatory issues gained through the work of the CNRA.

*The Joint Convention on the Safety of Spent Fuel management and on the Safety of Radioactive Waste Management* entered into force on 18 June 2001. As of March 2004, there were 34 contracting parties. The Joint Convention contains very similar obligations to those in the Convention on Nuclear Safety, but relating to spent fuel and radioactive waste. Experience with the review process is more limited, but so far general policies and practices appear to have received more attention than the regulatory regimes. This is probably because the latter have already been the subject of considerable discussion at previous CNS review meetings.

### **3.6 NEA observers and NEA outreach countries**

*NEA observers:* The Russian Federation and Slovenia have been official observers at the CNRA and the CSNI for about five years. Russia has also successfully hosted several NEA co-operative research projects.

Russia has a large nuclear industry of its own, operating 31 power reactors. In addition to lifetime extension of existing reactors, construction of new plants is under way. The Russian Federation has historical links with other countries, mainly in Eastern Europe, which operate nuclear power plants of Russian design. In addition to its observer status at NEA meetings, the Russian Federation is involved in various projects organised through the IAEA, the EU's programmes and the European Bank for Reconstruction and Development. Many other countries have also participated in close co-operation with Russia on a range of research projects, for which the technical facilities and expertise which is available in Russia has been invaluable.

*OECD outreach countries:* The Review Group is well aware of the outreach policy of the OECD with regard to non-member states and its implementation in the NEA co-operation framework under the guidance of the NEA Steering Committee. The Review Group notes that it would be in line with the outreach policy if the CNRA from time to time considers if there are countries with substantial nuclear programmes that are suitable as new candidates for observership and that could be encouraged to join.

### **3.7 The IAEA**

There remains a fundamental difference in the roles of the NEA and the IAEA in their respective memberships and responsibilities. The Convention on Nuclear Safety and the Joint Convention have stepped up the role of the IAEA as an "official" forum, while the strength of the NEA remains in it offering an open and free space for technical and professional exchange, nevertheless maintaining a capacity for joint positions or projects when the members so desire. The impossibility of achieving a formal MOU with the IAEA has not helped to streamline the relations between the two Agencies. The primary mechanism existing at this time for co-ordination is an annual meeting held between the NEA and the IAEA Secretariats. This is normally a one-day meeting held once a year covering high level concerns, but not in-depth discussions on specific issues. Additionally, contacts are made through IAEA attendance at the CNRA and Working Group meetings and through direct contacts between the Secretariats. The Review Group noted that, while improvements have been slow, there has been progress, which is a positive sign. More importantly, one area of major concern, "duplication", has been perceived as less of a problem by member countries in recent years. Thus, member countries consider that a somewhat better use of resources is being achieved, but further improvements in the coordination of activities between the two agencies could help the work of both. As it is clear that it will not be possible to achieve a MOU under the present circumstances, the Review Group members agreed that both agencies need to look at ways to enhance co-operation and co-ordination in the future. It was noted that communication combined with actively pursuing cohesive programmes of work at all levels of both Secretariats is essential.

*Safety Standards* – The ongoing developments on the IAEA International Safety Standards will have an impact, both from a regulatory standpoint and also from an industrial point of view. Many National Authorities will rely on them in the future, and so a *de facto* harmonisation will emerge, even if at a slow pace.

### 3.8 Licensee organisations

The main international organisation for the licensees is the World Association of Nuclear Operators (WANO), which consists of four regional centres around the world and a co-ordinating centre in London. Attempts by the CNRA and WANO to improve interaction (e.g. 2002 Regulatory Forum) have not been entirely successful, partly due to the proprietary nature of the information provided to WANO by its member utilities, but there are possibilities for future improvements. The participation of industry called upon by national organisations involved in NEA work should be fostered.

Nuclear utility co-operation within the EUR project has been described in Part II, Section 3.2.

As a key player, it is essential that the CNRA works towards improving its interaction with licensee organisations, without compromising the independency of the regulators. This interaction is even more important, considering the main issues being addressed (e.g. operating experience, human performance, etc.). Accordingly, the Review Group members agreed that the CNRA, as well as licensee organisations, needs to look at ways to enhance interaction and information exchange.

## 4. Future nuclear regulatory challenges

### 4.1 General comments

Chapter 3 of the 2004 Joint CSNI/CNRA Strategic Plan [2] lists a series of challenges that face regulators and safety researchers, now and over the next five years. As set out, these define the context in which the CNRA has to decide on those issues that need to be addressed in order to meet the new proposed joint mission statement:<sup>13</sup>

*“The mission of the CNRA and the CSNI is to assist member countries in maintaining and further developing the knowledge, competence, and infrastructure to support the safe operation through the lifecycle, and efficient and effective regulation, of NPPs and fuel cycle facilities, based upon sound technical information, shared experience and up-to-date methods.”*

Section 4 of the Joint Strategic Plan goes on to list a number of “strategic areas of work”, which should be the “focus of CNRA and CSNI activities.” The Plan provides some pointers on whether these strategic areas should be taken forward by the CNRA, the CSNI, or both Committees, but does not go on to identify the specific projects that the CNRA should be tackling.

The Joint Strategic Plan has to a large extent taken into account the 1997 CNRA report on Future Nuclear Regulatory Challenges [4], which identified some 100 or more issues of potential interest. The Review Group found that this report provides a very useful structure for the challenges, grouping the “issues at hand” under four headings:

- technical issues with potential regulatory impact;
- socio-economic and political issues with potential regulatory impact;
- organisational, management and human issues with potential regulatory impact; and
- international issues with potential regulatory impact.

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13. See Section 2 of the Joint CSNI/CNRA Strategic Plan [2].

The Review Group found that these headings provide a most useful way of structuring any further analysis of the specific issues that the CNRA needs to address over the next 5-10 years. In this context, the Group welcomes the CNRA Bureau decision in January 2005 to initiate periodic reviews of the main challenges listed in the Joint Strategic Plan. The Review Group regards such periodic reviews as very important in order to keep the list of regulatory challenges from the 1997 report alive and updated, integrating selected areas and issues into successive strategic plans and programmes of work.

It follows from the previous paragraphs that the problem now facing the CNRA is thus not one of finding potential issues for further study, but of prioritising between the 100 or more issues already identified. Many of these have already been tackled, in varying depth and with varying degrees of success. Many, particularly those that deal with “soft” subjects, are inherently difficult for all regulators: even when issues seem to be wholly technical, regulators still have the task of ensuring compliance by licensees whose staffs are composed of fallible human beings. To be realistic, the CNRA’s sights need to be set on assisting its member countries to further develop their regulatory approaches, rather than claiming it has discovered the complete solution to particular issues. Thus it will need to decide on whether, and how often, to revisit some of the most important issues, where events or developments in regulatory experience indicate that there could be further learning, to the benefit of the CNRA’s members.

As a first step in the selection and priority-setting process, it should be ensured that the CNRA efforts meet basic criteria of usefulness to members. A useful starting point in order to narrow the field of potential issues would be to check whether:

- the issue is of relevance to many member countries;
- international co-operation is essential, or at least useful, to discuss, and possibly resolve, the issue;
- the expected output will provide significant added value to nuclear safety; and
- the NEA is the best place for international co-operation on this specific issue.

One of the aims of the Review Group, therefore, is to provide some pointers to those issues that are likely to be worth further discussion. In considering how this can be done, it is important to recognise that there are other organisations outside the NEA, and indeed other committees and working groups within the NEA, which may be most appropriate groups for those discussions. It is also necessary to recognise CNRA’s mandate,<sup>14</sup> which states:

- “...constitute a forum for the exchange of information and experience among regulatory organisations.”
- “...review developments which could affect regulatory requirements...”
- “...offer suggestions that might improve them [regulatory requirements]...”
- “...avoid unwanted disparities between member countries.”
- “...review current management strategies and safety management practices and operating experiences at nuclear facilities with a view to disseminate lessons learnt.”

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14. A proposal for a revised mandate was approved by the CNRA as a part of the Joint CSNI/CNRA Strategic Plan and is now waiting for approval by the Steering Committee.

- “...promote cooperation among member countries to feedback the experience to safety improving measures, enhance efficiency and effectiveness in the regulatory process and to maintain adequate infrastructure and competence in the nuclear safety field.”

The CNRA is thus, according to its mandate, a vehicle for discussion and the exchange of information and is unlikely to be the best place for resolution of technical problems for which mainly the CSNI is the proper NEA forum. The CNRA is better placed to deal with issues of regulatory policy, exploring the reasons for different approaches in different member countries, and through this process, ensuring that despite any differences, all of the essential elements of good regulation are present, in accordance with internationally recognised standards.

Amongst the key ingredients required by regulators to perform their work are analysis, evaluation and feedback of operating experience, and regulatory inspections. These two go hand in hand with each other.

The CNRA should discuss in depth and conclude at each meeting what actions are appropriate on the basis of information and recommendations presented by the operating experience and results of inspections. A risk-informed perspective is important when setting priorities.

#### ***4.2 Possible regulatory issues for the CNRA to focus on***

In general terms, the Review Group did not identify any regulatory issues that were not already included in the 1997 report on *Future Nuclear Regulatory Challenges* [4] and in the Joint CSNI/CNRA Strategic Plan [2]. There was, however, a broad consensus in the Group on the areas for the CNRA mainly to focus on.<sup>15</sup> It is not surprising that a first group of areas and issues is largely associated with the operational safety of an ageing reactor fleet and changing patterns of NPP ownership and electricity markets:

- management of plant ageing;
- life extension and licence renewal, including upgrading to new standards;
- power upgrades and safety margins at existing reactors;
- succession planning for staff in utilities, TSOs and regulatory bodies;
- organisational matters – nuclear facilities as part of wider energy supply utilities;
- human factors; and
- decommissioning.

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15. Physical protection of nuclear installations against terrorism has been identified as an obvious safety and policy challenge. It has however been found unsuitable for the type of open, multilateral technical discussions that characterise NEA work, due to the high degree of confidentiality that applies to much of the information. Moreover, the IAEA has launched a substantial program in the area and the IAEA has a long experience with handling classified information on a bilateral basis, through its work in the non-proliferation area.

All these areas and issues include technical and scientific aspects, as well as regulatory policy aspects.

A second group of areas and issues concerns the regulatory process itself:

- risk-informed regulation;
- public information, as part of the regulatory process; and
- regulatory efficiency/effectiveness.

These areas and issues are mainly associated with regulatory policy and working methods.

Moreover, the Review Group has found that assessments of operating and inspection experience should be regarded as a third area that cuts across all the preceding areas and issues and in fact, the CNRA has clearly recognised the use of operating and inspection experience as an essential element in ensuring nuclear safety.

While all of the areas and issues in the 1997 report, as well as in the new Joint Strategic Plan, have been discussed by the CNRA over the past years, it is, however, pertinent to ask which should be taken forward by the CNRA as the issues of highest priority, considering the resources available for CNRA work in member organisations and in the NEA Secretariat, and which might be dealt with more appropriately by other committees or groups. Clearly, all have “potential regulatory impact” and if the CNRA was to delegate some of these areas of work to other groups, it would wish to retain a strong interest in the way the work was done, the timescales involved, and in the emerging conclusions.

Looking at the three groups of issues, there is little doubt that the leadership for the second group should remain with CNRA. The discussions on “Risk-informed regulation” have taken place within the CNRA. The CNRA set up the Working Group on Public Communication and the work on “Regulatory efficiency/effectiveness” lies at the heart of the drive for continuous improvement in the regulatory process. However, there may be more options for taking forward the issues in the first group. All are of keen interest to the CNRA, but as indicated in the 1997 report, all are composed of a series of sub-issues, some of which are very specialised and which might, therefore, be better dealt with elsewhere.

What the CNRA needs to do is to look critically at these sub-issues, check whether they provide a sufficient coverage of the subject (adding more, or subtracting, as needed), and then to decide which is the most appropriate forum in which to take these forward, framing carefully composed terms of reference for any work which it may decide to delegate.

As to the third group, assessments of operating and inspection experience, it needs to remain an area in continuous focus for the CNRA, to ensure that no signals from the real world of operating reactors indicating emerging safety concerns go undetected. This is underlined both in the current NEA Strategic Plan and in the CNRA Mandate.

### ***4.3 Issues associated with an ageing reactor fleet and changing patterns of reactor ownership***

It is very clear that the issues falling into this group are of relevance to most, if not all, member states with nuclear power programmes. All have ageing reactors and most, with the coming

liberalisation of electricity markets, are likely to have to face up to new patterns of management/ownership of their nuclear facilities.

Not all are likely, in the short to medium term, to have to address the issue of new reactors, and even for those member countries where there are such plans, the indications are that new reactors are likely to be closely based on well-tried design principles. Other groups are already examining the prospects for more radical designs, for example Generation IV, and the Review Group, therefore, does not believe that the CNRA should devote much time to this issue, other than to keep a watching brief, receiving reports from time to time for information from those member countries where there are firm proposals for new build.

However, the management of plant ageing, life extension and licence renewal, power upgrades and safety margins at existing reactors, are of direct interest to all member countries. It is in these areas that there is the potential for major incidents. The CNRA needs to keep these issues high on its agenda, keeping closely in touch with the work going on within the IAEA in order to ensure that the CNRA views are reflected into documents currently under development. The same applies to the issue of power upgrades and safety margins, closely linked to modern standards and upgrading.

Many countries are already engaged in decommissioning parts of their reactor fleet, and those not yet at this stage will need to begin to plan for decommissioning, and for any necessary regulatory changes. Decommissioning of reactors plants, however, is not generally regarded as posing major unknown safety hazards, although there are a number of radiation protection and waste management issues. The CNRA has, quite rightly in the view of the Review Group, so far limited its discussions on this issue.

Succession planning has already been the subject of considerable work within the CNRA and it will remain an issue. However, the broad conclusion of the work done so far is that this needs to be pursued on a national basis, since the circumstances, and hence the likely solutions, in each member country are markedly different.

Organisational matters and related safety management issues brought about by the restructuring of the utilities, by changing ownership patterns and by increased pressure on costs as a consequence of the liberalisation of electricity markets, form a major topical area likely to affect most member countries. Some are further down this path than others and there have been very significant problems in some countries as a result of these pressures. Experience to date is that changes in utility ownership may transfer nuclear assets into the hands of those whose previous experience lies in non-nuclear fields. The CNRA members need to be alert to the dangers of diluting and/or undervaluing nuclear experience at the top and senior levels in these new utility holding groups. The Review Group considers that this is an area where there is a genuine need for those countries that are in the forefront of these developments to use the opportunity of the regular CNRA meetings to keep other member countries informed, so that they can perhaps avoid some of the pitfalls that await.

The subject of human factors, in terms of the regulatory action that can be taken to minimise the likelihood and consequences of human error, is one that will remain of permanent interest to the CNRA. Civil aviation experience clearly shows that, as a technology matures, deficiencies in the interaction between man, technology and organisation tend to be the dominating cause of incidents and accidents, rather than technical design deficiencies. This topical area is closely related to that covered by the Working Group on Operating Experience (WGOE), and possible improvements to the methods of interaction with the WGOE are discussed in greater detail in the following section.

## **5. Observations on the way forward**

### ***5.1 Interaction with the NEA Steering Committee: the need for overviews***

The CNRA is perhaps in a unique position, its members having a complete overview of the results of the work done by designers, operators, owners and regulators of nuclear installations to enhance nuclear safety, to advise the NEA Steering Committee how it could best assist in achieving this objective. This would open a channel for dialogue that has possibly been under-utilised in recent years, and by helping the Steering Committee with its work, to win increasing trust and respect for the work of the CNRA. Improving the channels of communication would also help improve co-operation with the other the NEA standing committees, encouraging work on the right topics and discouraging duplication. This also reflects the evolving role of nuclear regulatory organisations (i.e. CNRA members) with more independent standing and increased responsibilities concerning nuclear safety as well as that Nuclear Safety and Regulation is the highest priority area among the strategic arenas listed in the NEA Strategic Plan.

It is considered that upward communications from the CNRA to the NEA Steering Committee could be strengthened and that, in addition to the regular reports by the Chairpersons of the various committees to the NEA Steering Committee, there would be merit in the production of a periodic overview report on nuclear safety from the regulatory point of view. This would provide a proactive method of advising the NEA Steering Committee of any changes that the CNRA considers to be helpful to nuclear safety in the member countries. As well as reporting on its own work and on any major developments affecting nuclear safety in member countries, it could, for example, advise on:

- any projects which might be undertaken in any part of the NEA to enhance nuclear safety;
- any projects which the CNRA perceives should be watched with respect to potential negative impact on nuclear safety;
- any change in its own mandate or in that of other NEA committees and working groups, which it considers would enhance nuclear safety;
- any reallocation or strengthening of resources that it considers would enhance nuclear safety.

### ***5.2 The NEA standing committees***

#### ***5.2.1 General***

As has already been stated, the Review Group welcomes the development of a Joint Strategic Plan to provide a better integration of the work programmes of the CNRA and the CSNI, but it considers that this is only a part of the solution to what is really a more global NEA issue. The CNRA's mandate, which is supported by the Review Group, requires the CNRA to "...organise its own affairs." It goes on to say that "In implementing its programme", the CNRA "shall establish co-operative mechanisms with" the CSNI, CRPPH, and RWMC and "The Committee shall maintain an oversight of all NEA work that may impinge on the development of effective and efficient regulation", which calls for co-operation with all the standing committees. The Review Group therefore encourages the CNRA Chair to strengthen the links with the chairpersons of other groups, so that appropriate efforts of all parts of the NEA are devoted to the issues likely to contribute most to nuclear safety in all member countries.

### 5.2.2 *Committee on the Safety of Nuclear Installations (CSNI)*

In order to perform its work efficiently, the CNRA requires scientific and technical support from the CSNI. In the mid-term perspective, this requires the best available expert opinions based on existing knowledge. In the longer term, this needs to be based on improved understanding based on knowledge achieved through research and development. Whilst the CSNI has been willing to embark on longer term research and development, there has perhaps occasionally been a reluctance to offer rapid expert opinion based on present knowledge, the latter being what is most often needed when dealing with a current problem. Therefore, the close relation and co-operation between the CSNI and the CNRA needs to be maintained and further developed, so that the routes for both short term expert opinion and the results of longer term research and development are opened more freely.

This includes obtaining information and being cognizant (through the reports provided by the CSNI at each CNRA meeting) of the work being performed by the various working and special expert groups in relation to the main challenges. Moreover, some uncertainties need to be resolved about the proper fora for discussing regulation of some fuel cycle installations, also involving the CSNI and its activities on fuel cycle safety.

The CSNI/WGOE has a particularly important function to perform vis-à-vis CNRA. The CNRA should discuss in depth and conclude in each meeting what actions are appropriate on the basis of information and recommendations presented by the CSNI/WGOE, as well as information and recommendations from the CNRA/WGIP. Activities that integrate analysis of events and analysis of inspection experience could be very fruitful and should be considered. While the analysis of operating experience is essential to the CSNI in order to improve methods and data used in safety assessments and to judge the need for additional research, the analysis of operating experience is essential for the CNRA to discuss in order to judge the need for regulatory responses in different time frames and to assess the effectiveness of various regulatory actions in preventing recurrence of certain types of events. While the WGOE thus has to serve both the CSNI and the CNRA, the added value to nuclear safety from analysis of operating experience could be more rapidly and effectively accomplished if the WGOE belonged to the CNRA, at the same time serving the CSNI with recommendations on more long-term studies to be performed by the CSNI.

### 5.2.3 *Radioactive Waste Management Committee (RWMC)*

The RWMC Regulators' Forum (RWMC-RF) strikes a delicate balance between many stakeholder interests. By and large, it has functioned well. Annual reports have been made to the CNRA, with little feedback, probably for two reasons: the RWMC-RF has focused on licensing of deep geological repositories and, to some extent, on decommissioning (delegates to the CNRA are in many cases at present only marginally involved in such activities), and the safety issues of spent fuel and waste repositories are in most cases quite different from reactor safety issues – although there are some common areas (see below).

Only a few countries have so far started the process of actually licensing deep geological repositories and associated installations (e.g. encapsulation facilities). More countries will, in a not too distant future, move into such activities, so there is a growing interest of sharing licensing experience. Particular attention will be needed by the RWMC to ensure that the needs of regulators are considered and their independent standing is respected.

There are a few areas where exchange of approaches and experience between the CNRA and the RWMC-RF should be explored, such as:

- public communication and stakeholder involvement; and
- how to proceed from various types of scientific and technical safety analyses to regulatory requirements for a safety case to be used as a basis for licensing and for engineering design basis specifications.

In summary, there appears to be no strong arguments for any major changes in the relations between the CNRA and the RWMC-RF at this time, but some joint activities in areas of common interest might be considered. Moreover, the CNRA needs to be kept informed on any regulatory issues addressed by the RWMC, so that the CNRA can respond, if needed, to ensure proper co-ordination of the programme of the Agency concerning the regulation, licensing and inspection of nuclear installations with regard to safety, as foreseen in the original CNRA Mandate.

#### 5.2.4 *Committee on Radioactive Protection and Public Health (CRPPH)*

The CRPPH principal areas of interest are at present:

- evolution of the System of Radiological Protection (close interaction with ICRP);
- stakeholder Roles in Radiological Decision Making;
- Nuclear Emergency Planning, Preparedness and Management (much focus on international information exchange and consequence management in case of a nuclear accident, including legal aspects); and
- Occupational Exposure Management (ISOE System).

Overviews of the CRPPH activities are presented at the CNRA meetings. In summary, there appears to be little overlap and the need for any co-ordination with the CNRA can mostly be handled through the NEA Secretariat and the committee chairs. Some joint activities in areas of common interest and a cross-cutting character might be considered, such as decommissioning and public communication in emergency situations, in particular the early phase of a nuclear accident.

#### 5.2.5 *Nuclear Development Committee (NDC)*

In recent years, the NDC has performed most of its work without significant input from the CNRA. This was mainly due to the types of products being produced by the NDC. However, from time to time, the NDC has discussed and examined issues that crosscut with those of the CNRA. For example, it was noted that the NDC is launching a study that will evaluate the licensing processes and nuclear energy in the competitive electricity markets in various countries.

The key questions proposed by the NDC to be answered by the study highlight the need for a common view within the NEA to better support the Steering Committee. Again, this underlines the need for the CNRA to exercise a clear co-ordinating role for activities that include safety regulation aspects to be undertaken by other committees within the NEA.

### 5.2.6 *Other standing committees*

Based on the work performed, little interaction has been needed with the remaining standing committees, the Nuclear Science Committee (NSC) and the Nuclear Law Committee (NLC).

## 5.3 *CNRA internal working methods*

### 5.3.1 *Structure*

The Review Group agreed that, subject to the following proposed changes, the current structure is sufficient to meet the goals of the CNRA:

- *Working Group on Inspection Practices* – should expand its mandate to cover an integrated assessment overview process (i.e. inspection results, reviews, reports, indicators, etc.).
- *Working Group on Public Communication* – should complete the current review of its mandate to assess its main lines of work.
- *Working Group on Operating Experience* – the Review Group recommends organisationally moving the WGOE from the CSNI to the CNRA.

The Review Group also noted the Committee should, on a continual basis, re-assess the number of working and senior level task groups. One aspect which may further enhance the effectiveness and efficiency of the Committee is to increase, if possible, the communication between the Committee and the Groups. As the recent meeting showed, the Committee needs to clearly articulate what the Working Groups need to accomplish *and* to provide the necessary support (e.g. resources, etc.). In return, the Working Groups need to respond accordingly to the Committee.

Finally, in order to effectively implement the Joint Strategic Plan, the CNRA should consider setting up a small joint CNRA/CSNI Programme Advisory Group, made up by a few key members of each of the two Bureaux, to advise both committees on appropriate co-ordination of their programmes of work, and that the proposed programmes of work are discussed at a joint Bureau meeting before they are put to the two committees for approval.

### 5.3.2 *Exchange of information*

National reports need to be more focused on specific regulatory issues and lessons learnt that could be of benefit to other members, and not be based simply on what has happened over the past 6 months. A conclusion from the recent meeting to report on how countries have actually used results from the CNRA in their regulatory framework has a lot of merit.

The recommendations presented in the 1997 review, e.g. more focus on regulatory policy issues, adding discussions on radiation protection (CRPPH) and radioactive waste (RWMC), etc., have been mostly incorporated into the programme of work. One important aspect that has not been fully incorporated is that the CNRA should prepare summaries of discussions on the significance of the material to regulators.

### 5.3.3 *Regular meetings*

One of the benefits to the CNRA members is that the association between members during meetings and throughout the year creates a “regulatory network”. Having a forum where members meet and discuss directly with others twice a year has proven invaluable in providing the CNRA members immediate contacts in other countries to discuss emerging issues (i.e. urgent regulatory problems, sensitive issues, etc.) on a bilateral basis. The review group noted the following:

- The current number of meetings appears appropriate.
- Clear outcomes need to be established for any meeting, forum or workshop.
- Meeting participants should be senior regulators having adequate authority to commit resources.
- Meeting participants should have adequate communication skills.

### 5.3.4 *Workshops, fora and special meetings*

It is unrealistic to assume that there is a need to have a forum every year, just on the basis of bringing together top level regulators. The committee needs to be realistic in its objectives and who the audience is for a selected topic. Additionally, the committee needs to carefully consider the issue(s) to be discussed, the timing, other international meetings and most importantly the resources needed in planning meetings, forum and workshops.

### 5.3.5 *Products*

The Review Group observed that it would be beneficial for the CNRA to prepare a short document that would define the types and basic structure of publications, their target audiences and the type of peer reviews and endorsements needed prior to publication. In addition, the following elements were noted:

- The Review Group noted that the CNRA has recognised that it is difficult to judge whether dissemination of products is adequate and to measure how useful they are, and as a result has agreed to add a round table discussion at future meetings on how products are used.
- The Green Booklet series as published so far has no clear identification (i.e. number system or topic classification).
- There does not seem to be a need to review older documents as to current validity, as such. The Review Group noted that such an effort would require resources, which could be used for much better purposes. It is assumed that members and users can individually establish the validity of using such documents.

### 5.3.6 *Knowledge management*

A key issue for the entire nuclear community is knowledge management. The Review Group considers that the recent CNRA Historical Perspectives report provides a unique document for preserving Committee memory and should be a major reference for all new members. Other possible steps that can be taken to enhance the knowledge management are:

- When membership changes are being contemplated (for the CNRA, the working groups, etc.), the CNRA members should consider having an orderly turnover (e.g. the retiring and new members would both attend a meeting together prior to the changeover).
- For short term tasks (e.g. senior level task groups), it is important to have clear membership from the beginning to the end. Changes have been seen to cause inefficiency, in that new members are not always up-to-date on decisions that were made previously.
- The Secretariat should have adequate resources and staff engaged in CNRA activities to ensure that the work of the Committee (e.g. its corporate memory) is not reliant on one person.



## *Appendix A*

### **HOW THE REVIEW WAS ACCOMPLISHED**

#### **A.1 Mandate and composition**

At its June 2004 meeting, the CNRA agreed to set up an independent Review Group to review the role, activities and working methods of the CNRA. It was agreed that members of the Review Group would consist of former members of the CNRA or those with detailed knowledge of its history. The Bureau, with the assistance of the Secretariat, developed a mandate and a list of potential members for the group. The mandate contained four basic objectives as follows:

1. To characterise the current role, priorities and working methods of the CNRA.
2. To identify and analyse issues of concern and suggest ways to further increase the efficiency and effectiveness and the visibility of the Committee.
3. To review the role and interactions between the Committee and the other NEA standing committees and international organisations and suggest ways to improve co-ordination and co-operation. Specific attention should be applied to the relationship between the NEA safety committees (CNRA and CSNI).
4. To formulate recommendations concerning the mid-term and long-term role and orientation of the Committee and, in particular, the balance between “technical” and “policy” related activities.

The Review Group was directed to prepare a report on its findings for presentation to the CNRA at its June 2005 meeting. In formulating its report, the Review Group was directed to gather its information through reviewing CNRA documents (e.g. summary records, reports, etc.), holding interviews (e.g. past and present CNRA members, working group chairs and the NEA Secretariat, etc.) and, if deemed appropriate, issuance of a questionnaire. A complete list of references is provided in Appendix C.

#### **A.2 Conduct of the review**

##### *First meeting*

In order to achieve its objectives, the Review Group met in early November 2004. Prior to meeting, members prepared and e-mailed preliminary comments and personal views on an initial set of questions developed by the Chairman. These were as follows:

- What do you think the main areas and scope of CNRA activities should be?
- Taking into account the Joint CSNI/CNRA Strategic Plan, what would you say are the main challenges (issues and topics, mid-term and long-term) that CNRA should work and focus on? Are there some challenges missing in the Strategic Plan?

- What would you say are the main factors to consider in order to ensure the future effectiveness and efficiency of CNRA (including e.g. type and visibility of activities and outputs, main target groups, etc.)?

In addition to discussing the above questions, open discussions were held covering the CNRA areas and the scope of work it performs, organisational and working methods and its interactions with others. Following these discussions, the Group developed a structure for the report, assignments and a timeline for completing its work.

### ***External inputs***

The next phase included obtaining observations from outside the group and developing the first draft of the report. Discussions were held with many different parties to ascertain different observations on the work of the CNRA. This included the CNRA itself (a round table discussion was held at the December 2004 annual meeting), requesting comments and (in some cases) interviewing the Chairs of the other NEA standing committees, the working group chairs from both the CNRA and the CSNI and members of the NEA staff.

The Chairman has kept in touch with the Chairman of the CSNI Assessment Group, to promote appropriate co-ordination of the work of the two groups. Additionally, inputs were received from the CNRA members, standing committee chairs and working group chairs, such as:

- CNRA members during a round table discussion at November 2004 CNRA meeting;
- written inputs from standing committee chairs: RWMC (M. Federline), NDC (S. Guindon) and CSNI (A. Thadani);
- interviews with working group chairs: WGIP (H. Klöckner), WGPC (A. Jörle) and WGOE (A. Vandewalle); and
- interviews with NEA staff including L. Echávarri, J. Reig, H. Riotte.

### ***Writing the report***

The following months (December 2004 to March 2005) up until the second meeting, involved going through several iterations of the draft report by receiving and incorporating comments from the Group to successive draft versions. The Review Group met on the 22 and 23 of March 2005 to review and produce a final draft report focussing on the conclusions and recommendations in Part I.

Following a final comment and proof-reading period, the report was finalised in April and presented to the CNRA at the June 2005 meeting.

### **A.3 Timeline for the main activities of the Review Group**

First meeting of Group	9-10 November 2004
Discussion at CNRA meeting and interviews	30 November-1 December
Input draft texts from Group members	end December
Invited input from CNRA members and others	before 23 December
Draft report to Group members	mid January 2005

Comments from Group members	mid February
Revised draft of report	28 February
Second meeting of Group	22-23 March
Finalisation of report/transmittal to CNRA	end April
Presentation to CNRA	13 June 2005

#### **A.4 Brief biographical information on the Review Group members**

- Lars Högberg (Sweden), Chairman – former Director General of the Swedish Nuclear Power Inspectorate (SKI). In addition to numerous other international positions, he served as Chairman of the NEA Steering Committee (1998-2003), as Chairman of CNRA (1994-1997), as Vice-chairman of CSNI (1988-1993) and was a member of the CSNI Sub-committee on licensing. He has also served as an IAEA Governor for Sweden.
- Michel Asty (France) – former head of international programmes at the French Regulator (DGSNR). He served as a member of the CNRA Bureau (1997-2001).
- Kazuo Sato (Japan) – Chairman of the Nuclear Safety Commission in Japan. He served as Chairman of the CSNI (1991-1994) and served on the first CSNI Senior Group of Experts on Severe Accident Research (SESAR).
- Eduardo Gonzalez Gomez (Spain) – Former Commissioner of the CSN in Spain. In addition to serving on numerous other international groups, he was the first Chairman of the CNRA (1989-1994) and was a member of CSNI Sub-committee on licensing. He has also served as an expert consultant to the CNRA on previous reviews and for a number of reports and international fora.
- Jim Furness (United Kingdom) – Former Deputy Chief Inspector at the UK Nuclear Installations Inspectorate, (NII) (1994-2004). He has served as a member of the CNRA Bureau (1999-2004).
- Sam Collins (United States) – Currently a Regional Administrator at the Nuclear Regulatory Commission. He served as CNRA Bureau Member/Vice-chairman of the CNRA (1998-2004).
- NEA Secretary: Barry Kaufer – Currently the Deputy Head of the Nuclear Safety Division. He has been at the NEA for 12 years.



## *Appendix B*

### **COMPARISON WITH THE 1997 REVIEW**

As noted at the beginning of Part I, the final report represents the collective experience of the Review Group members as earlier active participants in NEA activities. Throughout the development and writing of this report, the Review Group used the references in Appendix C to help identify and analyse the various issues. In addition to the NEA and the Joint CSNI/CNRA Strategic Plan [1] and [2] respectively, the 1997 Review of the Role, Activities and Working Methods of CNRA [6] was a key document.

As part of the final draft, the Review Group reviewed this report in detail, to ensure that all issues (recommendations and conclusions from the 1997 report) were covered in their discussions. The following is a brief comparison of the results from the 1997 and this report.

#### **B.1 Main recommendations (Chapter 6, 1997 Report)**

1. The membership of the CNRA Bureau should be expanded to five members, and the Bureau should take a more active role in selecting future topics and guiding the preparation of regulatory presentations of the topics to the CNRA.

*Part I, Section 2, deals with the programme of work and priorities and the work of the CNRA and its Bureau. In addition, the Review Group points out in Part II, Section 2.1 that the enlargement of the Bureau was probably one of the most beneficial changes from the recommendations in the previous review.*

2. The CNRA Bureau should review the mandate of the CNRA and propose revisions to reflect current circumstance and future issues likely to face CNRA members.

*Part I, Sections 1 and 2, deals with the recently approved mandate and the programme of work and priorities.*

3. The CNRA Bureau should develop closer co-operation and co-ordination of regulatory matters between the CNRA and the CSNI, RWMC and CRPPH.

*Part I, Section 4, deals with the relationships between the CNRA and these committees as well as the other NEA standing committees.*

Chapter 6 of the 1997 report also states “There is broad agreement that the CNRA can serve as a uniquely important forum, but to do that it must provide a forum for discussing topics that are useful for members and must be efficient with member’s time.”

*Part I, Section 7, deals with internal working methods of the CNRA.*

## **B.2 Findings (Chapter 5, 1997 Report)**

### ***What should be the scope of CNRA activities?***

There should be more focus on regulatory policy issues such as those mentioned above (i.e. safety culture, reduced resources and evaluating the quality of safety management).

*This report maintains this finding as noted in the Executive Summary and Part 1, Section 2.*

Broader topics on radiation protection and radioactive waste should be included occasionally on the agenda. This means that the CNRA will have to work more closely with the CSNI, RWMC and CRPPH.

*The topics of radiation protection and radioactive waste and the associated interactions between the CNRA and these standing committees are covered in Part I, Sections 2 and 4.*

Technical presentations to the CNRA on technical safety issues (e.g. steam generator tube cracking) should have a regulatory summary that states the significance of the material to the regulators.

*Part I, Sections 2 and 4, deals with these issues.*

### ***Who should attend CNRA meetings?***

The effectiveness of the CNRA depends directly upon the level of participation by the member countries. In general, the meetings should be attended by senior level regulators who are decision-makers and who control resources to support CNRA discussions.

The usefulness of presentations is directly related to the amount of preparation and co-ordination that has been done beforehand. It was agreed that to make the regulatory issue presentations useful will require several member countries to make a real commitment of resources to support CNRA.

*Both of these findings are reviewed and discussed in Part I, Section 7.*

### ***What topics should be addressed by the CNRA?***

The CNRA topics must be of high relevance to the needs of the member countries.

*See Part I, Section 2.2.*

An ongoing topic of interest to members is the lessons learnt from operational incidents.

*This report expands this finding as noted in the Executive Summary and Part 1, Sections 2 and 3, to recommend organisationally moving the WGOE to the CNRA.*

More attention should be given to regulatory policy issues such as safety culture and safety vs. economics, as well as broader issues like radiation protection and waste management.

*This report maintains this finding as noted in the Executive Summary and Part 1, Section 2.*

It was agreed that the Working Party on Future Regulatory Challenges, chaired by Chris Willby, will provide highly useful information to guide CNRA agenda.

*The 1997 report is referenced throughout this report and considers the information provided still highly relevant.*

***Should there be changes to CNRA's organisation and operation?***

Because the issues facing nuclear regulators have changed, it would be useful to examine CNRA's mandate to see if it should be refreshed in light of today's circumstances.

*The Review Group has endorsed the current mandate, which was approved by the Committee in November 2004 and is being presented to the NEA Steering Committee for approval in May 2005.*

Regulatory issue presentations should be well prepared and the goal of the meeting should be to reach a clear understanding of the issues within the CNRA, with a summary issued soon after each meeting.

*This finding is reviewed and discussed in Part I, Section 7.*

The CNRA should consider taking the results from the Working Party on Future Regulatory Challenges and form a Standing Working Group charged with guiding the preparation of regulatory presentations on the issues selected by the CNRA. Alternatively, this function could be served by the CNRA Bureau if it were expanded to 4-5 members.

*This finding is reviewed and discussed in Part I, Section 7.*

The CNRA should anticipate closer relationships with the CSNI, RWMC, and CRPPH.

*The topics of radiation protection and radioactive waste and the associated interactions between the CNRA and these standing committees are covered in Part I, Sections 2 and 4.*

The Review Group members emphasised the importance of timely establishment of meeting dates and agendas, and the preparation of meeting summaries.

*This finding is reviewed and discussed in Part I, Section 7.*



## *Appendix C*

### **REFERENCES**

- [1] NEA (2005), *The Strategic Plan of the Nuclear Energy Agency (2005-2009)*, OECD, Paris, Web and paper versions available.
- [2] NEA (2005), *Joint CSNI/CNRA Strategic Plan (2005-2009)*, OECD, Paris, Web and paper versions available.
- [3] NEA (2005), CNRA mandate (2005) – *The CNRA mandate is contained within the Joint CSNI/CNRA Strategic Plan (2005-2009)*. See Reference 2. The Mandate was approved by the CNRA at its 2004 Annual Meeting (November) and has been presented to the NEA Steering Committee at its April 2005 meeting for approval.
- [4] NEA (1997), *CNRA Report on Future Nuclear Regulatory Challenges (1997)*. The original report is currently out of print, but downloadable copies can be obtained at the NEA web site.
- [5] NEA (2005), *CNRA: A Historical Perspective (1989-2004)*. [NEA/CNRA/R(2004)2] is available either at the NEA web site or by request to the Secretariat.
- [6] NEA (1997), *1997 Report on the Review of the Role, Activities and Working Methods of the CNRA*. This is an internal CNRA document, which is available upon request to the Secretariat.



## *Appendix D*

### **ACRONYMS**

CNRA	Committee on Nuclear Regulatory Activities
CRPPH	Committee on Radiation Protection and Public Health
CSNI	Committee on the Safety of Nuclear Installations
EU	European Union
EUR	European Utilities Requirements
IAEA	International Atomic Energy Agency
ICRP	International Commission on Radiological Protection
INRA	International Nuclear Regulators Association
NDC	Committee for Technical and Economic Studies on Nuclear Energy Development and the Fuel Cycle
NEA	Nuclear Energy Agency
NLC	Nuclear Law Committee
NPP	Nuclear Power Plant(s)
NSC	Nuclear Science Committee
OECD	Organisation for Economic Co-operation and Development
PSA	Probabilistic Safety Assessment
RWMC	Radioactive Waste Management Committee
RWMC-RF	Radioactive Waste Management Committee – Regulators Forum
TSO	Technical Support Organisations
WANO	World Association of Nuclear Operators
WENRA	Western European Nuclear Regulators Association

WGIP	CNRA Working Group on Inspection Practices
WGOE	CSNI Working Group on Operating Experience
WGPC	CNRA Working Group on Public Communication (of Nuclear Regulatory Organisations)

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