

Unclassified

NEA/CSNI/R(2000)3



Organisation de Coopération et de Développement Economiques
Organisation for Economic Co-operation and Development

OLIS : 12-Jan-2000
Dist. : 14-Jan-2000

English text only

PARIS

NUCLEAR ENERGY AGENCY
COMMITTEE ON THE SAFETY OF NUCLEAR INSTALLATIONS

**THE STRATEGIC PLAN FOR THE COMMITTEE
ON THE SAFETY OF NUCLEAR INSTALLATIONS**

86168

Document complet disponible sur OLIS dans son format d'origine
Complete document available on OLIS in its original format

NEA/CSNI/R(2000)3
Unclassified

English text only

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

Pursuant to Article 1 of the Convention signed in Paris on 14th December 1960, and which came into force on 30th September 1961, the Organisation for Economic Co-operation and Development (OECD) shall promote policies designed:

- to achieve the highest sustainable economic growth and employment and a rising standard of living in Member countries, while maintaining financial stability, and thus to contribute to the development of the world economy;
- to contribute to sound economic expansion in Member as well as non-member countries in the process of economic development; and
- to contribute to the expansion of world trade on a multilateral, non-discriminatory basis in accordance with international obligations.

The original Member countries of the OECD are Austria, Belgium, Canada, Denmark, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The following countries became Members subsequently through accession at the dates indicated hereafter: Japan (28th April 1964), Finland (28th January 1969), Australia (7th June 1971), New Zealand (29th May 1973), Mexico (18th May 1994), the Czech Republic (21st December 1995), Hungary (7th May 1996), Poland (22nd November 1996) and the Republic of Korea (12th December 1996). The Commission of the European Communities takes part in the work of the OECD (Article 13 of the OECD Convention).

NUCLEAR ENERGY AGENCY

The OECD Nuclear Energy Agency (NEA) was established on 1st February 1958 under the name of the OEEC European Nuclear Energy Agency. It received its present designation on 20th April 1972, when Japan became its first non-European full Member. NEA membership today consists of 27 OECD Member countries: Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Luxembourg, Mexico, the Netherlands, Norway, Portugal, Republic of Korea, 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.

© OECD 2000

Permission to reproduce a portion of this work for non-commercial purposes or classroom use should be obtained through the Centre français d'exploitation du droit de copie (CCF), 20, rue des Grands-Augustins, 75006 Paris, France, Tel. (33-1) 44 07 47 70, Fax (33-1) 46 34 67 19, for every country except the United States. In the United States permission should be obtained through the Copyright Clearance Center, Customer Service, (508)750-8400, 222 Rosewood Drive, Danvers, MA 01923, USA, or CCC Online: <http://www.copyright.com/>. All other applications for permission to reproduce or translate all or part of this book should be made to OECD Publications, 2, rue André-Pascal, 75775 Paris Cedex 16, France.

COMMITTEE ON THE SAFETY OF NUCLEAR INSTALLATIONS

The NEA Committee on the Safety of Nuclear Installations (CSNI) is an international committee made up of scientists and engineers. It was set up in 1973 to develop and co-ordinate the activities of the Nuclear Energy Agency concerning the technical aspects of the design, construction and operation of nuclear installations insofar as they affect the safety of such installations. The Committee's purpose is to foster international co-operation in nuclear safety amongst the OECD Member countries.

CSNI constitutes a forum for the exchange of technical information and for collaboration between organisations which can contribute, from their respective backgrounds in research, development, engineering or regulation, to these activities and to the definition of its programme of work. It also reviews the state of knowledge on selected topics of nuclear safety technology and safety assessment, including operating experience. It initiates and conducts programmes identified by these reviews and assessments in order to overcome discrepancies, develop improvements and reach international consensus in different projects and International Standard Problems, and assists in the feedback of the results to participating organisations. Full use is also made of traditional methods of co-operation, such as information exchanges, establishment of working groups and organisation of conferences and specialist meeting.

The greater part of CSNI's current programme of work is concerned with safety technology of water reactors. The principal areas covered are operating experience and the human factor, reactor coolant system behaviour, various aspects of reactor component integrity, the phenomenology of radioactive releases in reactor accidents and their confinement, containment performance, risk assessment and severe accidents. The Committee also studies the safety of the fuel cycle, conducts periodic surveys of reactor safety research programmes and operates an international mechanism for exchanging reports on nuclear power plant incidents.

In implementing its programme, CSNI establishes co-operative mechanisms with NEA's Committee on Nuclear Regulatory Activities (CNRA), responsible for the activities of the Agency concerning the regulation, licensing and inspection of nuclear installations with regard to safety. It also co-operates with NEA's Committee on Radiation Protection and Public Health and NEA's Radioactive Waste Management Committee on matters of common interest.

TABLE OF CONTENTS

Summary	7
Introduction	8
I/ Mission of the CSNI	9
II/ Strategic areas of work	9
1. Assist Member countries in dealing with safety issues by providing a technical basis that will contribute to their resolution	9
2. Support the needs of regulatory authorities	9
3. Help maintain an adequate level of capability and competence in nuclear safety and research	9
4. Promote, organise and co-ordinate internationally funded safety research projects	10
5. Disseminate information	10
6. Provide Assistance to Member Countries' Safety Research Programmes	10
III/ Proposed strategy and structure	11
1. Necessary features	11
2. Structure and working methods; CSNI	11
3. Structure and working methods; Bureau	14
4. Structure and working methods; Programme Review Group	14
5. Common functions of the Working Groups	14
6. Common functions of the Special Expert Groups	16
7. Common functions of Task Groups	16
Appendix A Rationale for restructuring	17
A1. Working Groups	17
A2. Proposed mandate for the Working Group on Analysis and Management of Accidents (to be expanded later)	18
A3. Special Expert Groups (time limited)	18
A4. Proposed mandate for the Special Expert Group on Fuel Safety Margins (to be expanded later)	19
A5. General remarks	19
Appendix B Identification and approval of work	21
B1. Guidelines from CSNI to WGs about their work process	21
B2. Guidelines to be used by WGs in identifying and proposing work for CSNI consideration.	21
B3. Criteria for prioritising work	23
B4. Criteria for measuring success in achieving objectives	23
Appendix C Technical areas	25
C1. Introduction	25
C2. SESAR recommendations	25
C3. Issues with potential regulatory impact	26
C4. Summary of the review of the technical areas	26
Appendix D References	27
Appendix E List of authors, Strategic Planning Group	29

THE STRATEGIC PLAN FOR THE COMMITTEE ON THE SAFETY OF NUCLEAR INSTALLATIONS

Summary

Following the request from the NEA that all the committees should develop Strategic Plans and the report of the Effectiveness Review Group (ERG) on the effectiveness of CSNI's activities, CSNI created a Strategic Planning Group to review their working processes. In developing a five year rolling Strategic Plan, the Group has considered the need for more top-down direction by CSNI, stricter control on time limited Task Groups and improved communications including timely review and publication of reports.

The Strategic Planning Group, after reviewing the current work structure of CSNI and the current technical issues as laid out in the SESAR series of reports and the CNRA report on Regulatory Effectiveness, have made the following recommendations.

The basic elements of the CSNI will continue to be the Principal Working Groups, which will be known in future simply as Working Groups. The number of Working Groups and their areas of expertise will be reviewed periodically when the strategic plan undergoes a review. It is recommended that this Plan be reviewed every five years.

In order to provide better top-down direction by the CSNI, it is recommended that a small Programme Review Group (PRG) be created. The PRG will assist the CSNI Bureau to review proposals from the Working Groups, and enable the review of major reports to ensure high quality.

To ensure timely management of projects and reviews of proposals and reports it is recommended that CSNI have a second full meeting in early summer.

It is recommended that Special Expert Groups (SEGs) be created reporting directly to CSNI. These Groups would deal with issues that cut across the disciplines of more than one Working Group and be assigned clear time-limited mandates. The creation of SEGs on Fuel Safety Margins and on Human and Organisational Factors is proposed at this time.

Restructuring of the five Principal Working Groups into four Working Groups is recommended. This would be accomplished by merging the former PWG2 and PWG4 into a single Working Group and re-assigning some of their work to the new SEG on Fuel Safety Margins.

It is also recommended that the former Working Group on Fuel Cycle Safety be incorporated into the Working Group on Operational Experience (former PWG1).

Criteria for measuring the priority and success of CSNI projects have been developed. It is also proposed that CSNI review the overall effectiveness of this new Strategic Plan two to three years after its implementation to ensure that the desired level of efficiency, control and direction has been achieved.

Introduction

The CSNI and its Principal Working Groups (PWGs) have proved to be a valuable forum for the exchange of information and for the discussion of safety relevant issues. NEA Member countries have expressed their strong support for their activities. The work of the PWGs, mainly of technical collaboration, has contributed substantially to the process of learning and improvement of the personnel from all the organisations involved, with direct benefits for the safety of the installations in the Member countries.

Most Member countries are now facing stagnant or decreasing research budgets and are strongly pushing for even more efficient use of their resources. A results orientation is therefore more important than ever before. To be efficient, topics must be selected according to the impact they have in the overall safety level of the installations or activities. International collaboration is very efficient at achieving good results with fewer resources. A balanced participation of all Member countries is desirable to ensure that the opinions presented reflect the full consensus of the members and that the work is fairly distributed.

Recently, an ad-hoc ERG was established by the NEA to review the effectiveness of the nuclear safety activities [1]. Key recommendations included:

- The CSNI needs to exert more top-down direction to the programmes of the PWGs.
- The CSNI should adopt a rolling five-year strategic plan consistent with the overall mission of the agency.
- CSNI sub-groups (sometimes called Task Groups) should be task-oriented, ceasing to exist when their task is completed.

Other recommendations included ensuring wide distribution for the collective opinions on safety issues and exploring other means of ensuring effective communication of the committee's activities.

The Nuclear Energy Agency's Strategic Plan, published in 1999, has recommended that all of its Committees review their programmes and produce their own strategic plans.

As a result of these recommendations, a Group was formed to develop a strategic plan for the CSNI and to recommend ways in which the Committee can address the issues identified by the ERG. The members of Strategic Planning Group are identified in Appendix E. Two meetings were held in Paris, one in March 1999, where the key technical issues were discussed as identified in the three SESAR[2,3,4] reports and in the recent CNRA report on Regulatory Effectiveness [5]. The Group met again in July 1999 to discuss the organisation of the CSNI in light of the current technical challenges and has made recommendations for a revised structure for the Working Groups and Task Groups. In addition, recommendations are made regarding the work process including the production and approval of reports. These recommendations are supported by the technical needs identified in the March meeting of the Strategic Planning Group as described in Appendix C.

I/ Mission of the CSNI

To establish full comprehension of the role of the CSNI, the following mission statement has been created, which is consistent with the mission statement in the NEA Strategic Plan: **“The mission of the CSNI is to assist Member countries in maintaining and further developing the scientific and technical knowledge base required to assess the safety of nuclear reactors and fuel cycle facilities.”**

To carry out their mission, the CSNI relies on a membership of senior representatives of the national nuclear safety communities of the Member countries, empowered to speak on behalf of their national safety policies. They have traditionally been assisted by a Bureau consisting of the Chairman and Vice Chairmen of the CSNI who meet typically twice a year, promoting ideas, identifying problems and recommending solutions. In order to implement the recommendations of the ERG for more top-down direction, it is recommended that a PRG be established to assist the Bureau in identifying issues, reviewing proposals and reports and recommending action to the CSNI. To ensure that the initiation of CSNI projects and the delivery of their products can be implemented in a timely manner, it is recommended that the CSNI meet twice a year to hear the recommendations of the PRG.

II/ Strategic areas of work

Activities carried out by CSNI members should be focused on the following key objectives.

1. *Assist Member countries in dealing with safety issues by providing a technical basis that will contribute to their resolution*

- Identify the scope, type, nature and priority of scientific and technical knowledge needs necessary to resolve current and potential future safety issues.
- Organise fora to discuss and promote convergence on key aspects of such issues.
- Prepare state-of-the-art reports, and other documents for technical specialists as well as decision-makers that provide methods, data and solutions.
- Help Member countries to further develop and validate computer codes used in safety analyses.

2. *Support the needs of regulatory authorities*

- Respond to the needs identified by CNRA.
- Identify, through analysis of operating experience and/or research, trends and issues that may affect the safety and regulation of nuclear installations.

3. *Help maintain an adequate level of capability and competence in nuclear safety and research*

- Provide an effective network of safety specialists and exchange of information among Member countries.

- Review critical needs and define possible international approaches to the problems.
- Assist Member countries in the organisation of programmes to strengthen staff competence.
- Co-operate and exchange information with Russia and other Member countries where appropriate.
- Serve as bodies of expertise that can be drawn upon to assist Member countries in the planning and execution of research programmes and in the resolution of safety issues.

4. *Promote, organise and co-ordinate internationally funded safety research projects*

- Review, on a continuous basis, safety-related operating experience in order to identify potential problems that would benefit from collaborative research.
- Identify either deficiencies in the state of knowledge of, or uncertainties in, the behaviour of reactor systems and components important to safety, and the operator.
- Identify and promote maintenance of key safety research facilities required to perform the necessary research.

5. *Disseminate information*

- Share information with both OECD and non-OECD countries through methods such as technical reports, technical opinion papers, collective opinion statements, databases, etc.
- Be the international leader in identifying safety issues, research results and information related to issue resolution.
- Contribute to the technical basis for the development of standards and guidelines by participating in other international groups (e.g., IAEA).

6. *Provide Assistance to Member Countries' Safety Research Programmes*

- Be a point of contact for assistance to Member countries in safety research programmes as required.
- Co-ordinate with Member countries and international organisations to implement assistance in a cost-effective way.

III/ Proposed strategy and structure

1. Necessary features

In order to achieve its mission and the objectives outlined above, and the recommendations of the ERG [1], the following features of the CSNI and its activities are deemed necessary. These features have been considered in the recommended restructuring.

- The network of experts appropriate to the current safety issues must be preserved.
- CSNI must maintain effective guidance and control of the Working Groups.
- CSNI must be able to deal effectively with “crosscutting” issues, that is, issues that involve expertise in more than one Working Group or Committee.
- Important lessons and findings from CSNI activities must be reported to the CSNI and the Member countries.
- Major reports must be “peer-reviewed” before presentation to the CSNI
- Reports must be useful to Member countries (e.g., identify scope of useful research needed, identify solutions, etc.).
- CSNI must establish improved communication with external groups (NEA and outside NEA).

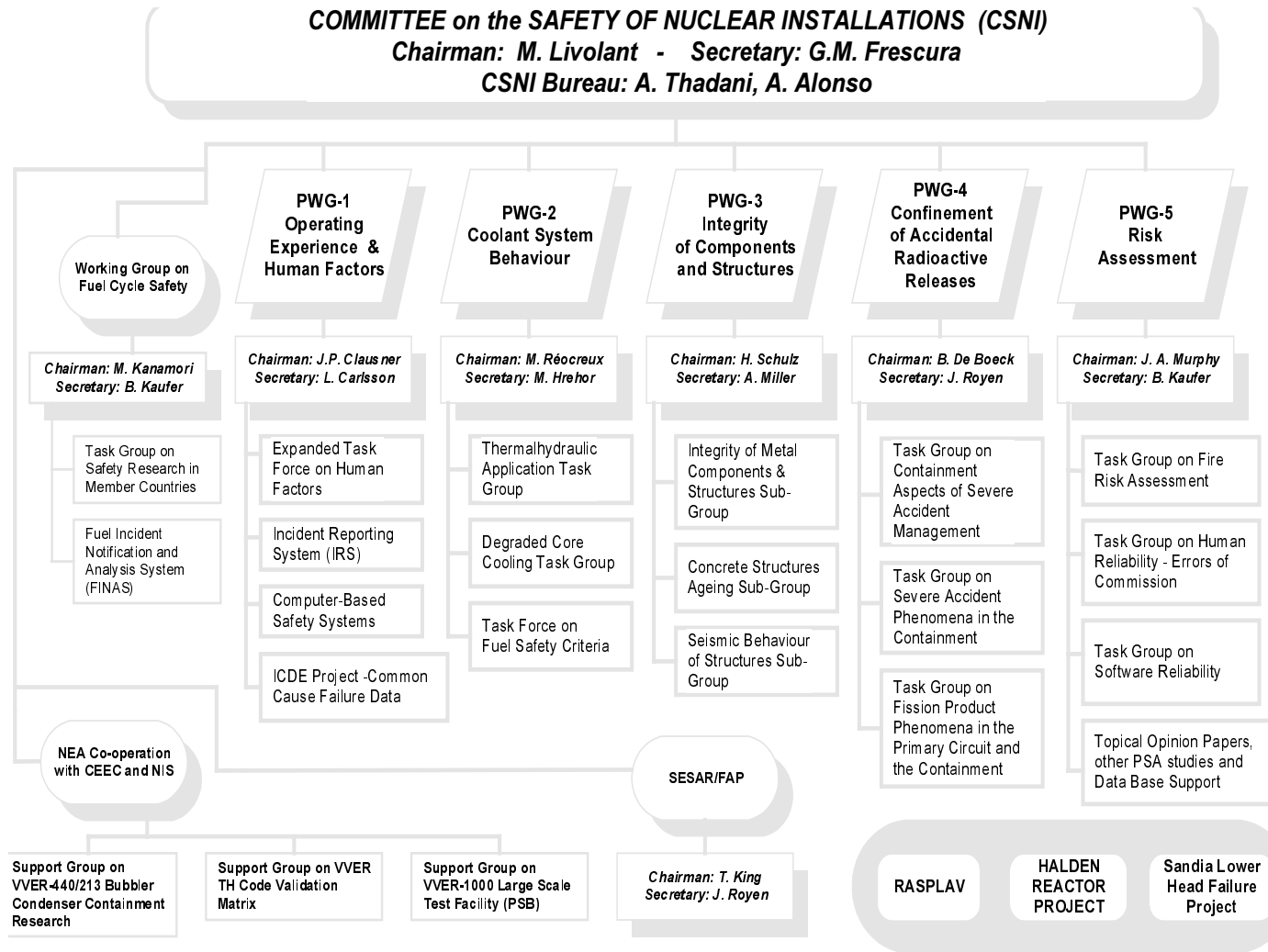
2. Structure and working methods: CSNI

The Strategic Plan has been written to provide guidance for the CSNI in addressing the objectives of the previous Chapter. The ERG [1] recommended that there be more top-down direction of CSNI activities. The authors of this report recognised that if CSNI is to exert more control on the programmes, a formal process for reviewing documents (proposals and reports) was needed. Recognising that the Bureau was too small to take on the task of reviewing documents, the formation of a PRG is recommended. This PRG is to assist the Bureau and is charged with ensuring that proposals and reports have appropriate focus and receive appropriate review.

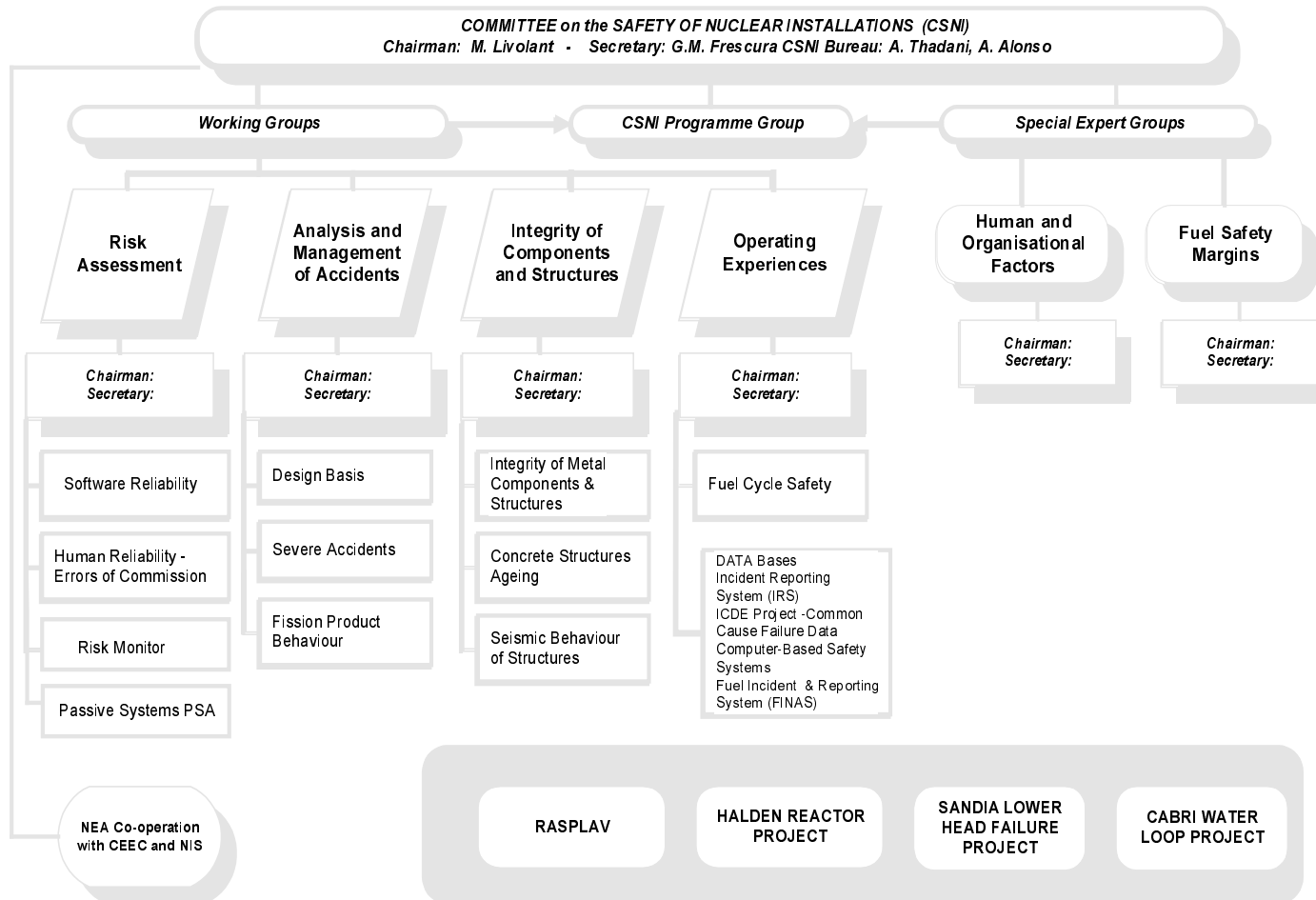
It is also recommended that CSNI meet twice a year to ensure that programmes are carried out in a timely way. Besides speeding up the approval process this will allow CSNI more time to consider individual proposals. The annual CSNI meeting in the past has had to deal with an overloaded agenda in too short a time for adequate consideration of proposals and decision making. A second meeting will also provide an opportunity for a detailed discussion of specific issues of high importance. It is noteworthy that the CNRA meets twice a year.

The current structure of CSNI is outlined in Figure 1a and the revised structure in Figure 1b. The Strategic Planning Group has recommended the restructuring described below following a thorough review of the current technical issues in the Member countries. Rationale for the changes is given in Appendix A.

**FIGURE 1A
CURRENT STRUCTURE OF CSNI**



**FIGURE 1B
REVISED STRUCTURE OF CSNI**



Working Groups, identified by descriptive titles, will replace the numbered Principal Working Groups. The Working Groups will report directly to CSNI and will have a continuous mandate that will be reviewed at such time as the Strategic Plan is reviewed (anticipated to occur every five years). For time-limited activities that cut across two or more disciplines, SEGs will be created. They will also report directly to CSNI but will have a clearly specified mission and schedule. They will be terminated when their missions are completed.

Specifically the CSNI should:

- Create a PRG reporting to the Bureau to provide more Committee-level review and direction to the WGs.
- Create and maintain Working Groups as the main forum for discussion of safety relevant issues, exchange and information.
- Minimise the number of Task Groups. Give them a clear mandate with a time limit.
- Create as required “Special Expert Groups” to deal with crosscutting issues. These groups will report directly to the CSNI and have a clear, time limited mandate.
- Meet twice a year with a general meeting in early December and an additional meeting in early summer that could be devoted to special topics and urgent matters.
- Initiate a review of this Strategic Plan as needed but at intervals no greater than every five years.

3. *Structure and working methods: Bureau*

The CSNI Bureau consists of the Chairman and Vice-Chairmen of the CSNI. It has traditionally provided direction and advice to the CSNI and meets at more frequent intervals.

In order to facilitate the need for more top-down direction by CSNI, it is proposed that the Bureau be assisted by a PRG. Specifically, it is proposed that the PRG be formed by one expert from each of the four countries with the largest nuclear safety research programmes (i.e., US, Japan, France and Germany), plus three experts from the other CSNI countries chosen on a rotating basis every two years.

4. *Structure and working methods: Programme Review Group*

The PRG will assist the Bureau and enable a more rapid initiation of proposals and approvals of reports. It will also play a role in assuring the quality of the CSNI work. Details on how the review process is carried out are provided in Appendix B. Specifically, the PRG should:

- Compile a “CSNI List of Current Safety Issues” to be discussed and updated at the CSNI meeting. This list should include priorities.
- Review proposals from the WGs and make recommendations to the CSNI Bureau.
- Identify crosscutting issues and propose projects to address them.

- Review, and if necessary, draft Technical Opinion Papers and Collective Opinion Statements.
- Review major CSNI Reports and provide guidance and advice to the CSNI. The review will be mandatory for State-of-the-Art reports and documents of similar significance.
- Review the CSNI programme of work to identify key lessons and present a report at the CSNI meetings. Reference should be made to the effectiveness indicators in Appendix B.

5. *Common functions of the Working Groups*

The Working Groups are mainly composed of technical specialists in the field associated with the Working Group's mandate. While they may be created or disbanded at any time by CSNI, their mandates would normally be reviewed during the periodic reviews of this strategic plan.

After a review of the current programmes and issues, as laid out in the SESAR reports and the CNRA Report on Regulatory Effectiveness, the Strategic Planning group has proposed a reduction in the number of Working Groups from five to four. Some changes in responsibility are recommended for all of them except for the existing PWG3, which becomes the Working Group on Integrity of Components and Structures. The most significant change is the reduction of the total number of Working Groups from five to four, brought about by the merging of the former PWGs two and four. In addition two SEGs have been created, to be built upon the nuclei of two former Task Groups and to address issues that cut across two or more disciplines. Detailed rationale for the specific actions is included in Appendix A.

In the technical areas of interest the Working Groups shall:

- Serve as a centre of expertise.
- Maintain an efficient communication network among experts. This will include maintaining a list of national experts, which will receive information from the Working Groups, and participate in some of their activities such as workshops, etc.
- Review the main orientation of the WG's and trends. Identify emerging issues, discuss their implications and propose that the CSNI address these issues.
- Promote and help organise international autonomous research projects.
- Organise workshops, international discussions, International Standard Problems, etc. and submit the outcomes and conclusions to the CSNI.
- Prepare state-of-the-art reports, technical opinion papers and other papers as necessary. Ensure that they are submitted to the PRG in a timely manner.
- Through the efforts of the Chairman and Secretary, maintain an efficient interface with other groups operating in the same field, to minimise duplication and transfer information.
- Efficiently manage the projects approved by the CSNI.
- While continuing to take instructions only from CSNI, submit the results of their work and proposals for future activities to the new PRG.

6. *Common functions of the Special Expert Groups*

Special Expert Groups will report directly to CSNI and will be mandated for specific time-limited tasks. Presently it is recommended that two such groups be formed, one on Fuel Safety Margins and one on Human and Organisational Factors. These groups should be built upon the Task Group on Fuel Safety Criteria (currently part of PWG2) and the Extended Task Force on Human Factors (currently part of PWG1) respectively. The memberships should be supplemented to ensure that there is sufficient expertise to address crosscutting issues.

The common functions of the Working Groups as outlined in the previous section will, for the most part, also apply to the SEGs. Appendix A provides the rationale for the creation of the two SEGs.

7. *Common functions of Task Groups*

The Creation of a Task Group may be proposed by a Working Group to address a specific issue. CSNI may also create a Task Group and assign it to an appropriate Working Group at their discretion. Proposals from a Working Group for the formation of a Task Group must be directed through the PRG review process.

Existing Task Groups that have not been restructured by the Strategic Plan should be reviewed jointly by the new Working Groups and the PRG and their mandates and time limits clarified.

The existing Working Group on Safety of Fuel Cycle Facilities is to be attached to the Working Group on Operational Experience as a Task Group.

In their day to day operations the common functions for Working Groups (Section 5. above) will, for the most part, apply to Task Groups with the caveat that they keep to their mandated workscope and time limit.

APPENDIX A

RATIONALE FOR RESTRUCTURING

A1. Working Groups

The changes in the Working Group Structure are depicted in Figure 1a and b. The previously unaffiliated Group on Fuel Cycle Safety has been incorporated into the Working Group on Operating Experience because it deals mainly with operational experience at fuel cycle facilities. The former PWGs two and four have been combined and two SEGs on Human and Organisational Factors and Fuel Safety Margins have been established. Details and rationale follow below.

- The former PWG5 will become the Working Group on Risk Assessment. It will retain the Task Group on Human Reliability Analysis and their activities will be used to help define the work of the new Human and Organisational Factors Expert Group.
- The Working Group on Analysis and Management of Accidents is created by merging the former PWG2 and PWG4. The basis for the merger is that both of the PWGs have a foundation in computational fluid dynamics, safety analysis methodology and severe accidents and, since the issues and process of code development apply to both thermalhydraulics and severe accidents, combining those efforts should improve efficiency. Some Member states also send the same delegates to both PWGs so there is an added efficiency there. The Task Force on Fuel Safety Criteria, formerly in PWG2 will form the nucleus of a time-limited Fuel Safety Margins Group, reporting directly to CSNI. The new Working Group will initially consist of the following three Task Groups, but this structure will be reviewed at the first meeting.
 - Design basis accident analysis and management and related thermalhydraulics
 - Severe accident analysis and management and related thermalhydraulics
 - Fission product behaviour
- The Working Group on Component and Systems Integrity is basically unchanged from the former PWG3. Reference should be made to the SESAR Reports and the CNRA Report on Regulatory Challenges to ensure that their work continues to reflect the needs of the community.
- The Working Group on Operating Experience is essentially the former PWG1. The former Working Group (so named in the old structure) on Fuel Cycle Safety will become a Task Group in this new Working Group because it deals mainly with operational experience at fuel cycle facilities. The Extended Task Force on Human and Organisational Factors is removed from the old PWG1 and will form the nucleus of the SEG on Human and Organisational

Factors. These changes will allow the WG to focus on analysing and developing insights from operating experience. Since human performance issues cut across all WGs, creation of the SEG on Human and Organisational Factors reporting directly to the CSNI will help better co-ordinate human performance work.

A2. *Proposed mandate for the Working Group on Analysis and Management of Accidents (to be expanded later)*

The mandate for this working group should be based on the following points:

- For current and advanced reactors, address the safety issues and physical processes associated with:
 - a) the reactor coolant system and related safety and auxiliary systems;
 - b) in-vessel behaviour of degraded cores;
 - c) the containment behaviour; and
 - d) fission product release, transport and deposition.
- For these areas, identify research needs and priorities, including validation, enhancement and development of computer codes.
- For these areas, exchange information and facilitate international convergence on accident management strategies.
- Provide a forum to address emerging issues.

A3. *Special Expert Groups (time limited)*

A need to address issues that cut across two or more disciplines is clearly identified in the review of the technical issues (Appendix C). This was a major driving force behind the creation of the concept of the Special Expert Group (SEG) reporting directly to the CSNI. CSNI can form an SEG at any time. The Strategic Planning Group are currently proposing the SEGs on Human and Organisational Factors and Fuel Safety Margins. Membership in an SEG could come from any group where the necessary expertise resides. For example, the SEG on Fuel Safety Margins may require representation from the Nuclear Science Committee to help deal with neutronics-related questions in reactivity insertion accidents. The two SEGs currently recommended are:

- The Human and Organisational Factors SEG is formed on the nucleus of the Extended Task Force on Human Factors. They should review their membership to ensure that they have the expertise to address crosscutting issues. They should continue to work under the guidance of the five-year strategic plan formulated by the former Extended Task Force. They should also review and respond to the recommendations and needs of the Working Groups on Risk and Operating Experience.
- The Fuel Safety Margins SEG. The current Task Force on Fuel Safety Criteria, which is removed from PWG2, will form the nucleus of this Group. It will need to influence work on the crosscutting issues related to fuel behaviour, including the work on relevant aspects of thermal-hydraulics, oxidation, chemistry, mechanical behaviour and reactor physics. It should be the centre for integrating the appropriate results from other Groups and Committees.

A4. *Proposed mandate for the Special Expert Group on Fuel Safety Margins (to be expanded later)*

The mandate for this group should be based on the following points:

- Assess the technical basis for current safety criteria and their applicability to high burn up, and to new fuel designs and materials.
- Determine needs and priorities for future safety research programmes in the area of fuel safety behaviour.
- Review from a safety point of view the methodologies used for reactor core assessments related to complex configurations, different fuel designs and types.
- Provide a forum to address emerging safety relevant fuel issues.

A5. *General remarks*

All Working Groups should review the Task Group structure at their first meeting and ensure that their programmes are consistent with CSNI needs and guidelines (as laid out in this Strategic Plan). Their deliverables and schedules should be clearly understood and the end point for each Task Group's mandate should be identified.

The CSNI, with the aid of The PRG, should apply a similar discipline to the SEGs.

APPENDIX B
IDENTIFICATION AND APPROVAL OF WORK

B1. Guidelines from CSNI to WGs about their work process

The CSNI acknowledges that the PWGs have, in general, done excellent technical work, a fact that deserves special recognition given the voluntary nature of most of the activities. These guidelines aim to achieve a more systematic and better-documented process for identifying and approving activities of the new Working Groups in the future. This will improve CSNI effectiveness and efficiency by helping to ensure work is directed towards products that are useful, timely and of high priority to Member countries. This will also help the Member countries to demonstrate more easily that the work performed is carefully selected and the process used to carry it out has efficiency and effectiveness as fundamental criteria. Consideration has been given to avoid creating a significant additional administrative burden over the WGs.

To achieve the goals indicated above a simplified work process has been developed and basic guidance elaborated for each step. Most of what is included in the guidance is already being done by the PWGs. The guidance itself is subject to feedback according to the experience that will be obtained; therefore, the WGs have a significant role in making it more useful.

B2. Guidelines to be used by WGs in identifying and proposing work for CSNI consideration.

B2.1. Identification of a topic for collaboration

The topic will be identified by the WG (with occasional input from CSNI or NEA staff).

The topic should be:

- Consistent with the NEA Strategic Plan Goals.
- Responsive to guidance from the CSNI bureau or from the full CSNI.
- Systematic, resulting from a search of sources considered relevant. For example, two important sources are the review by SESAR and the results of NEA staff questionnaires about needs of the Member countries.
- Focused on results (e.g., solution of an issue, identify scope of work to resolve an issue, identify an issue, sharing of methodologies).
- Of value to Member countries (e.g., needed for decision-making).
- Timely, that is, addresses the issues in a time frame that is compatible with the needs of the Member countries.

B2.2 The characteristics of the proposed activity

The WGs should describe the characteristics of each proposal that should include a clear objective, scope and identification of the product of the work. A schedule with milestones that can be monitored by the PRG is also necessary.

Proposed activities should be at a programmatic level (i.e., define safety issues, research needs, criteria for issue resolution, interpret what research results mean, etc.). Products should support and be of use for safety decisions facing Member countries. Products could be Databases, Reports, Technical Opinion Papers, State of the Art Reports, International Standard Problem Reports, Technical Notes or Technical Position Papers.

In addition, the Work Process should be briefly described. This would include:

- Whether the work is to be done by a small subgroup of the WG or another arrangement.
- Identification of the participants
- Identify any co-ordination with other WGs, NEA committees, etc.

B2.3 Submission of the proposal/performance monitoring/product delivery

The proposal should be provided to the CSNI PRG well in advance of the next full CSNI meeting (e.g., by October 15 of each year for the December meeting). If the issue requires an urgent decision a short proposal could be distributed electronically to the PRG and CSNI members at any time.

The PRG will review and provide recommendations to the CSNI Bureau. At the CSNI Meeting the WG Chairman and the PRG Chairman will make short presentations on the proposal.

For activities approved by CSNI the NEA staff should provide a systematic tracking of activities to ensure adherence to work objectives and schedule, and raise to the Bureau of the CSNI any concerns requiring attention or actions to correct problems identified.

When the activity is completed, the product shall be sent to CSNI PRG for review two months prior to the full CSNI meeting. The PRG will provide its recommendations to CSNI two weeks prior to the full CSNI meeting.

B2.4 Presentations to the CSNI

At each CSNI full Committee meeting the WG Chairman should make summary presentations of the proposed, ongoing and completed work of the WG. The format for the presentations should be as follows:

New proposals:

- Objectives and scope.
- How will it be used and by whom.
- Schedule and milestones.
- Requested CSNI action.

Ongoing work:

- Status and specific findings of work completed to date.
- Upcoming activity in the next year.
- Schedule for completion, including comparisons to original schedule.
- Any needed CSNI action.

Completed work:

- Summary of work process and results (i.e., most significant findings).
- How the deliverables can be used.
- Proposal for dissemination of the deliverables.
- Requested CSNI action.

Uniformity in the WG presentations will help ensure that the actions requested of CSNI are clearly understood and that sufficient information is available to allow those actions to be taken.

B3. *Criteria for prioritising work*

In determining whether or not to approve a proposal and the degree of attention it requires, the PRG and CSNI should use the following criteria for prioritisation.

- Is it an issue of high importance to regulators in many OECD countries?
- Is the issue of potentially high safety significance?
- Is resolution of the issue better accomplished through international co-operation?
- Will work on the issue serve to maintain or develop key competencies or facilities?

B4. *Criteria for measuring success in achieving objectives*

In reviewing reports and other products of CSNI activities the PRG should measure the success by determining if the following outcomes apply:

- CSNI “products” are used to set priorities for national research programmes.
- CSNI “products” are used directly to support decision-making and resolve safety issues in Member countries.
- CSNI “products” avoid the need for a national programme on that issue.
- CSNI “products” provide peer reviews of national efforts on that issue, and thereby raise their quality.
- CSNI “products” directly contribute to the national research programme.

When presenting a completed project to the full CSNI meeting the PRG should report on these success criteria.

It is also recommended that the CSNI review the overall effectiveness of the new structure after two to three years of operation of this Strategic Plan with respect to CSNI's ability to control the programme and adherence of the programme to CSNI's strategic direction.

Factors for measuring CSNI's control of the programme are:

- Efficiency and Effectiveness of the new structure.
- Effectiveness of the work approval system.
- Accountability of WGs and SEGs for delivering work.
- Appropriateness and timeliness of the output of WGs and SEGs.
- Effectiveness of the system for reporting to CSNI.
- Effectiveness of the PRG.

Factors for measuring adherence to CSNI's strategic direction are:

- Delivery of a well-planned programme of work.
- Responsiveness to CNRA issues.
- Maintenance of effective and efficient networks.
- Ability to co-ordinate relevant and timely international research projects.
- Ability to raise international awareness and co-ordinate response on important issues.
- Ability to bring important findings or a consensus on important issues into the public domain.

APPENDIX C

TECHNICAL AREAS

C1. Introduction

In arriving at a recommendation for restructuring the CSNI Working Groups, the Strategic Planning Group reviewed the current technical issues as identified by CSNI and CNRA experts in their recent activities. Our purpose was to define major areas, activities and products CSNI and the WG's should be focussing on over the next several years and design a CSNI structure to ensure success .

The current challenges and safety issues that the CSNI should be addressing are identified in the recent series of SESAR Reports [2,3,4], the CNRA report on Future Nuclear Regulatory Challenges [5] and recent trends in the industry. Other sources may be added as future SESAR work, WG activities and operating experience develop.

C2. SESAR recommendations

The Senior Group of Experts on Safety Research (SESAR), composed of senior experts with wide responsibilities and experience in Member countries' nuclear power programmes, was set up at the end of 1991. Its mandate was to review the current situation in regard to safety research, to reflect on a rationale for safety research in years to come, to identify future needs, and to establish a priority list. The following steps have taken place over the last eight years:

- In 1993, publication of the report entitled “Nuclear Safety Research in OECD Countries” (SESAR Report) [2]
- The following report, published in 1995 and entitled “Nuclear Safety Research in OECD Countries: Areas of Agreement, Areas for Further Action, Increasing Need for Collaboration” (SESAR/FU Report) [3] assessed the situation concerning research areas of special importance for safety and regulation, safety research areas for which a common technical position existed, safety research areas for which further discussion was needed in order to achieve a common technical position, and safety research areas which should be given priority.
- In response to CSNI's concern that unavailability of large research facilities would make more difficult the understanding of complex thermal-hydraulic and severe accident phenomena, a report entitled “Nuclear Safety Research in OECD Countries: Capabilities and Facilities” (SESAR/CAF) [4] was published in 1997. The report concluded that, with respect to the ability of current safety research programmes to meet identified needs, technical programmes and facilities existed or were planned, although in most cases some additional effort appeared to be justified. Regarding longer-term safety needs, however, it was necessary to identify criteria that should be applied to determine which specific capabilities and facilities should be maintained.

In 1998, CSNI decided to set up a Senior Group on Nuclear Safety Research Facilities and Programmes (SESAR/FAP). Their mandate was to identify facilities potentially interesting for present or future international collaboration, to collect and discuss cost information about these facilities, staffing needs, in some cases for upgrading or refurbishment. They were also to make specific recommendations regarding facilities and research programmes, joint projects, etc., and, if necessary, to discuss other possible forms of international collaboration (e.g., data banks, exchange or sharing of experts, joint development of computer codes, etc.). A first report will be made available to the CSNI by the end of 1999. A draft of this report was also consulted in our deliberations.

C3. Issues with potential regulatory impact

Recently, the NEA Committee on Nuclear Regulatory Activities issued a report on Future Nuclear Regulatory Challenges⁽⁵⁾. Many challenges were identified which were classified as technical, socio-economic/political, organisational and international. It identifies current issues facing the nuclear industry and regulatory authorities as well as future trends. This report has been reviewed, along with the three SESAR reports and other recent information, to determine the key activities that the CSNI should focus on for the next five years. The major issues were identified and influenced the proposed restructuring as outlined below.

C4. Summary of the review of the technical areas

Two areas were identified in this review where the Strategic Planning Group believes SEGs are needed. Both of these areas, Fuel Safety Margins and Human and Organisational Factors, involve crosscutting issues that require expertise beyond that which exists in any single Working Group. They are both of high priority. In the case of fuel, utilities are moving now towards higher burn-ups, and use of MOX fuel and mixed cores. In the Human Performance area, the trend towards deregulation and privatisation have raised new concerns, especially in the area of safety management. Special attention should be paid by the SEG on Human and Organisational Factors to the work of the Working Group on Risk Assessment and the Working Group on Operating Experience. We recommend that PWG1 be reformed into a Working Group on Operating Experience that should include the present separate Working Group on Fuel Cycle Safety.

Work on codes needs to continue, especially towards application of best estimate analysis and the quantification of uncertainties. It is recommended that PWG2 and PWG4 be combined into a new Working Group on Analysis and Management of Accidents and continue to work on design basis and severe accidents. There remains work to be done in maintaining and further enhancing computer codes, in providing data for their validation, and in assuring that critical research facilities are maintained.

Ageing of plants remains a concern and work should continue with a focus on improving monitoring of plant condition and enabling life extension. Remaining concerns related to integrity of metal and concrete structures, as well as seismic behaviour of structures should also continue to be addressed. The current work of PWG3 should therefore continue in a new Working Group on Integrity of Components and Structures with special attention given to the recommendations of the forthcoming SESAR/FAP report.

We need to encourage more applications of risk information in regulation, prioritisation of research and analysis of off-normal conditions such as low power or shutdown. Work needs to continue in PSA development as well. The work of the current PWG5 should address all of this in a new Working Group on Risk Assessment.

APPENDIX D

REFERENCES

1. ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT (1998), Review of the Effectiveness of the Nuclear Agency's Committee Activities on Nuclear Safety, a Report by an ad hoc Effectiveness Review Group, OECD, Paris.
2. ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT NUCLEAR ENERGY AGENCY (1994), Nuclear Safety Research in OECD Countries, OECD Paris.
3. ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT NUCLEAR ENERGY AGENCY (1996), Nuclear Safety Research in OECD Countries, Areas of Agreement, Areas for Further Action, Increasing Need for Collaboration, OECD Paris.
4. ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT NUCLEAR ENERGY AGENCY (1997), Nuclear Safety Research in OECD Countries, Capabilities and Facilities, OECD Paris.
5. ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT NUCLEAR ENERGY AGENCY (1999), Future Nuclear Regulatory Challenges, a Report by the NEA Committee on Nuclear Regulatory Challenges, OECD Paris.

APPENDIX E
LIST OF AUTHORS, STRATEGIC PLANNING GROUP

The following members of the CSNI Strategic Planning Group contributed to this report:

Czech Republic	Dr. Frantisek Pazdera (NRIR)
France	Mrs. Catherine Lecomte (IPSN)
Germany	Dr. Klaus Wolfert (GRS)
Hungary	Dr. Ivan Lux (HAEA)
Japan	Dr. Kiyoharu Abe (JAERI)
Spain	Professor Agustin Alonso Santos/Mr. Jose I Villadoniga (CSN)
Sweden	Mr. Lars Gunsell (SKI)
United Kingdom	Dr. Peter D. Storey/Mr. John Cowley (HSE)
United States	Mr. Ashok Thadani (NRC)
OECD/NEA	Dr. Gianni M. Frescura (Head, NSD) Dr. Jacques Royen (NSD) Dr. Leonard A. Simpson (Consultant, Rapporteur)