Unclassified **NEA/CNRA/R(2010)1**

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

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NUCLEAR ENERGY AGENCY
COMMITTEE ON NUCLEAR REGULATORY ACTIVITIES

NEA/CNRA/R(2010)1
Unclassified

9th INTERNATIONAL NUCLEAR REGULATORY INSPECTION WORKSHOP ON TRAINING AND QUALIFYING OF INSPECTORS, INTEGRATION OF INSPECTION FINDINGS, AND INSPECTIONS OF NEW PLANTS UNDER CONSTRUCTION

WORKSHOP PROCEEDINGS

1st – 5th June, 2008, Haikko, Porvoo, Finland
Hosted by the STUK, Radiation and Nuclear Safety Authority

English text only

JT03279681

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

The OECD is a unique forum where the governments of 30 democracies work together to address the economic, social and environmental challenges of globalisation. The OECD is also at the forefront of efforts to understand and to help governments respond to new developments and concerns, such as corporate governance, the information economy and the challenges of an ageing population. The Organisation provides a setting where governments can compare policy experiences, seek answers to common problems, identify good practice and work to co-ordinate domestic and international policies.

The OECD member countries are: Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The Commission of the European Communities takes part in the work of the OECD.

OECD Publishing disseminates widely the results of the Organisation's statistics gathering and research on economic, social and environmental issues, as well as the conventions, guidelines and standards agreed by its members.

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 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.

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 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'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 NEA's Committee on Radiation Protection and Public Health (CRPPH) and NEA's Radioactive Waste Management Committee (RWMC) on matters of common interest.

ABSTRACT

The NEA Committee on Nuclear Regulatory Activities (CNRA) believes that an essential factor in ensuring the safety of nuclear installations is the continuing exchange and analysis of technical information and data. To facilitate this exchange the Committee has established Working Groups and Groups of Experts in specialised topics. 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...".

These proceedings cover the 9th International Workshop held by WGIP on regulatory inspection activities.

The focus of this workshop was regulatory inspection activities in 3 main areas:

- Training and Qualifying of Inspectors,
- Integration of Inspection Findings, and
- Inspections of New Plants under Construction.

FOREWORD

The main purpose of the Workshop is to provide a forum of exchange of information on the regulatory inspection activities. Participants will have the opportunity to meet with their counterparts from other countries and organisations to discuss current and future issues on the selected topics. They will develop conclusions regarding these issues and hopefully, identify methods to help improve their own inspection programmes.

The NEA Committee on Nuclear Regulatory Activities (CNRA) believes that safety inspections are a major element in the regulatory authority's efforts to ensure the safe operation of nuclear facilities. Considering the importance of these issues, the Committee has established a special Working Group on Inspection Practices (WGIP). The purpose of WGIP is to facilitate the exchange of information and experience related to regulatory safety inspections between CNRA Member countries. This Workshop, which is the ninth in a series, along with many other activities performed by the Working Group, is directed towards this goal. The consensus from participants at previous Workshops, noted that the value of meeting with people from other inspection organisations was the most important achievement.

The focus of this workshop was regulatory inspection activities in 3 main areas:

- Training and Qualifying of Inspectors,
- Integration of Inspection Findings, and
- Inspections of New Plants under Construction.

Members of Organising Committee wish to acknowledge the excellent planning and arrangements made by the staff of the hosting organisation STUK, Radiation and Nuclear Safety Authority of Finland, in particular Mr. Timo Eurasto. Mr. Steve Lewis, Chairman of WGIP presided as Workshop Chairman.

Special acknowledgement is given to the members of WGIP who worked as facilitators and recorders for each of the topics.

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

The main objectives of the WGIP Workshop are enabling inspectors to meet with inspectors from other organisations, to exchange information regarding regulatory inspection practices, to discuss the selected topics, to discuss current inspection issues and to develop conclusions and commendable practices (if possible) on the selected topics.

As part of the registration form, participants were asked to provide answers to a questionnaire describing practices within their own countries on the various topics for inclusion as pre-workshop information. The complete compilation of questionnaire responses is contained in the appendix (separate report) to this document.

Approximately fifty (50) participants from seventeenth (17) different countries and one international organisation took part in the workshop (Appendix 1). Countries included: Canada, Czech Republic, Finland, France, Germany, Hungary, Japan, Korea, Lithuania, Mexico, the Netherlands, Poland, Spain, Sweden, Switzerland, the United Kingdom and the United States.

Six (6) discussion groups were established for the working group sessions. Each group was consisted of inspectors from different countries, to ensure diversity of views for each of the topics. Discussions groups met for 3 separate sessions to review the various topics. Exchange between participants was active and the groups formulated conclusions on the various issues selected for the discussion topics.

Evaluation of the workshop results are based on questionnaire responses received from the participants at the closing of the workshop. The evaluation showed that as in the past workshops, the highest value perceived, was in meeting and exchanging information with inspectors from other organisations. Responses also showed that the format selected was highly favoured and that more workshops of this type are supported in the future.

The results of the evaluation also reflected that participants in exchanging information are provided a unique opportunity to "calibrate" their own inspection methods against those from other countries. While exchanging inspection practices and learning new ideas are part of the main objectives, this opportunity to recognise and understand commonalties and differences is equally important.

Conclusions

Overall discussions between the various participants both in discussion group sessions and throughout the workshop were extensive and meaningful. Ideas and practices regarding regulatory inspection activities were exchanged and it can be foreseen that these ideas will provide improved expertise when being applied in the future. Based on follow-up discussions, WGIP members agreed that:

> *The workshops on regulatory inspection practices held by the CNRA Working Group on Inspection Practices, continue to provide a unique opportunity for inspectors and inspection managers of nuclear power plants to meet and share and exchange information.*

The main conclusions consist of list of commendable practices for each topic that were developed by the discussions groups. These are fully listed in Chapter 6.2.

2. ORGANISATION / OVERVIEW OF WORKSHOP

2.1 Planning

Preliminary planning for this workshop, the ninth in a series, of International Workshops on Regulatory Inspection Activities began following the conclusion of the previous workshop in Toronto, Canada, in October 2006. Formal planning started following approval by the CNRA at its annual meeting in June 2007.

Members of the Working Group on Inspection Practices (WGIP) reviewed comments and suggestions made at previous workshops and considered and discussed ways to improve the format of the workshop.

2.2 Location

The workshop was hosted by the STUK, Radiation and Nuclear Safety Authority and took place at Haikko, Porvoo, Finland, 1st – 5th June, 2008.

2.3 Topics

Participants at the last workshop [reference: NEA/CNRA/R(2007)1/2] suggested numerous topics for discussion at a future workshop. The Working Group considered these topics and also reviewed various proposals on other topics. A list of topics were developed and proposed to the CNRA. Consensus and approval on the topics to be addressed was reached at the June 2007 CNRA meeting. Members of the workshop committee further defined the issues to be discussed under each of these topics as summarised in the following paragraphs:

2.3.1 Training and Qualifying of Inspectors

The workshop will give regulatory inspectors an opportunity, to share their own experience on appropriate expertise and to learn about international practised approaches to qualification and training of inspectors. An important objective will be to compile initial knowledge and qualification requirements for newcomers, initial training as well as retraining and further development of necessary skills for experienced inspectors. At the end, all regulatory inspectors must have the appropriate skills to act as qualified counterparts to the licensee of the nuclear facilities under regulatory inspection.

2.3.2 Integration of Inspection Findings

The objective of the workshop is to explore practices in regulatory agencies regarding integration of regulatory inspection results into overall measures of licensee performance. The workshop could review different approaches used now in the world. The outcome of this workshop could be a State of the Art Report (SOAR).

2.3.3 Inspections of New Plants under Construction

At the moment only few countries are constructing new nuclear power plants but several countries are planning to construct new plants in the near future or are already in licensing process of new NPPs. On the other hand, inspection of new plants and of large modifications to an operating plant may have some common challenges. The workshop participants will have the opportunity to share their own actual experience, both from inspection of new plants and of large modifications to an operating plant. They will draw conclusions to determine the most important issues of inspection during construction. They may also have the opportunity to develop new ideas and approaches.

2.4 Announcement

The workshop announcement was transmitted in the fall of 2007. As part of the registration form, participants were asked to provide answers to a questionnaire describing practices within their own countries on the various topics for inclusion as pre-workshop information. The results were transmitted to participants one month in advance of the workshop.

2.5 Pre-Workshop

2.5.1 Facilitator Training

Prior to the start of the workshop, facilitators and recorders attended a training session. Mr. Steve Lewis chaired this session. Mr. Lewis reviewed the general objectives of the workshop and outlined the various characteristics required of a good facilitator and recorder. He noted the importance of their role in guiding the group and the methods required to manage an effective discussion. Facilitators and recorders for each topic broke out in separate groups to review the various issues transmitted by the participants and to outline the major points to be covered in the discussion sessions.

2.5.2 Reception / Dinner

A reception and dinner was held following delegate registration at the workshop hotel. Participants were given the opportunity to socialise and exchange information in an informal setting in order to familiarise themselves with each other. Mr. L. Reiman, Director, Radiation and Nuclear Safety Authority (STUK) made a few short remarks welcoming participants to the workshop.

2.6 Overview of Workshop

The format of the workshop used a process, which was first utilised in 1992 at Chattanooga and has evolved over the continuing series of workshops. Following an opening session to ‘set the scene’, participants were divided into six small discussions groups to discuss in detail the various topics selected. A closing session was held to review the results of the discussions and commendable practices that have been derived.

Based on the success of the last workshop and in order to continue improving the exchange of information and assist participants in their preparation WGIP members volunteered to compile and analyse the responses to these questionnaires as well as act as lead facilitators during the workshop. A compilation of these papers is produced as Appendix to these proceedings, and were used as background material for the group discussions.

2.6.1 Opening Session

Following the welcoming remarks from the host country, the opening session included a brief introduction of workshop objectives by the Chairman and presentation of the three (3) workshop topics including the results of the survey.

2.6.2 Group Sessions

Participants were divided into six discussion groups based on their pre-selection, to discuss topics. Three (3) half-day sessions were held. A trained facilitator and recorder worked with each group to stimulate and encourage discussions. The results are provided in Chapter 4.

2.6.3 Presentations by host country representatives

Staff members of the Radiation and Nuclear Safety Authority presented information on the recent regulatory issues in Finland, safety significant events in Olkiluoto 1 (Common cause failure in diesel start motors and Reactor scram at to generator over voltage) and status of the final repository project in Onkalo.

2.6.4 Closing Session

Following the completion of the group discussions, facilitators and recorders met and developed a set of conclusions based on the discussions. One facilitator from each topic presented the conclusions and recommendations that were developed by their respective groups. A question and response period followed each topic. Following the presentations, an open panel discussion was held on the results of the Workshop. This was followed by general conclusions made by the workshop Chairman.

2.6.5 Technical Excursion

As an additional offer to all participants a technical excursion tour was made to the Olkiluoto NPP, construction site and operating units, final repository. Staff members of the plant operation organisation provided an introduction and a guided tour of the facility.

3. OPENING SESSION

3.1 Welcoming Remarks

Mr. Lewis, Chairman of WGIP opened the workshop by welcoming the participants. He noted the importance and relevance of this type of workshop and the excellent opportunity it presented to both inspectors from OECD Member countries and non-member countries to meet and exchange information on important issues. The daily work of regulatory inspectors depends on their own individual national culture, national legal framework and national nuclear regulations.

Mr. Kaufer provided a short introduction and Mr. Lewis presented the main objectives of the workshop, basic information on the set-up of the programme, the expected products and different roles of the facilitators, recorders and participants.

Presentation of the results from the pre-work shop surveys were made by Mr. Klonk (Training and Qualifying of Inspectors), Messrs. Forsberg and Rinfret (Integration of Inspection Findings) and Messrs. Kobetz and Stockmann (Inspection of Plants under Construction).

3.2 Training and Qualifying of Inspectors

Dr. Klonk provided an introduction to the topic based on the responses to the questionnaire. In relation to training and qualification of inspections, he noted the workshop will give regulatory inspectors an opportunity, to share their own experience on appropriate expertise and to learn about international practised approaches to qualification and training of inspectors. An important objective will be to compile initial knowledge and qualification requirements for newcomers, initial training as well as retraining and further development of necessary skills for experienced inspectors. At the end, all regulatory inspectors must have the appropriate skills to act as qualified counterparts to the licensee of the nuclear facilities under regulatory inspection.

Summarising the responses, Dr. Klonk presented the following slides:

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Nuclear Energy Agency

What is the initial qualification for regulatory inspectors?

- *What educational qualification is required to get a job at the regulatory inspection body (field of expertise, university degrees, experience at industry, special examinations to get the job)?*

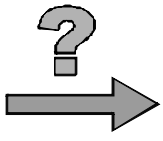
3

Agence pour l'énergie nucléaire
Nuclear Energy Agency

What is the initial qualification for regulatory inspectors?

Common requirement:
University degree in engineering, physics, chemistry,
but .....

- No experience
- 3 years of experience
- 5 years of experience
- significant experience
- industrial experience



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Nuclear Energy Agency

What is the initial qualification for regulatory inspectors?

- Is it beneficial to have a formalized predetermined entrance qualification?
- Are there other (non-technical) requirements, like personal qualities?
- Who is in charge of hiring new inspection personnel?

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Nuclear Energy Agency

How is basic training for newcomers at the regulatory body organised and accomplished?

- *How do you further train your newcomers, whether they come with or without professional experience? (At your organisation, at outside schools, at nuclear sites, on the job, by senior inspectors, how long or how many hours,…)*
- *Which topics are covered, e.g., legal basis, technical background, nuclear technology, specific features of the plant to be inspected, inspection skills?*

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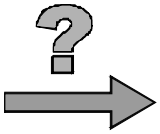
Nuclear Energy Agency

How is basic training for newcomers at the regulatory body organised and accomplished?

Common features: The list of training issues is similar to all:
nuclear technology, national legislation,
internal RB procedures and documents, inspection skills,
but ...

- training plan developed for each person individually - standardized training plan for all
- training at nuclear power plants and simulator
- 2 / 3 / 4 / 5 years of training time
- final examination
- official certification



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How is basic training for newcomers at the regulatory body organised and accomplished?

- How is your experience in using individual training plans compared to standardized plan? What flexibility is needed?
- Is a final examination beneficial? If so, for whom?
- What is the value of an official certification of inspectors?

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How do you take care for different inspection skills?

- *Different fields or functions for inspections may require different skills. How is this managed?*
- *Is there additional training, e.g., for senior functions, for resident inspectors, for specialised expertise, for human and organisational factors?*
- *Do you train regulatory inspectors to act as generalists, as assessors, for specialised tasks?*
- *Does your country require official certification to act as an inspector?*

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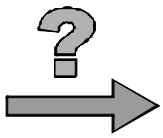
How do you take care for different inspection skills?

Most answers cover only technical skills and expertise.
Common features:

- All technical areas and skills
- + specialists
- + training on the job
- Some countries classify inspectors for dedicated inspection tasks



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How do you take care for different inspection skills?

- How do you develop personal skills?
- What kind of social competence?
- Interrogative techniques to be trained?
- insights on human factor influence?
- inspection of organisational factors?
- Influence of inspections on inspected people?

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How do you manage retraining of inspectors?

- *How do you organise and develop retraining or other periodical qualification measures?*
- *Are there formal requirements, how often and how much is such retraining performed?*
- *Are there special differences, e.g., for different positions or in case of change of position? Is an official re-certification necessary?*
- *What are the tools you use for training, e.g., classroom lessons, NPP simulator of licensee, own simulators, mock-ups, computer based methods.*

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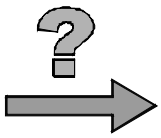
How do you manage retraining of inspectors?

Common feature: retraining is required, mostly about 5% of working time, but not very formalized

- 40 / 80 hours per year
- 5% of working time
- concept of continuous training
- capability improvement training
- self development
- training issues as for previous questions



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How do you manage retraining of inspectors?

- Should the RB develop a plan for retraining?
- Formalized retraining is required for NPP operation personnel. As the regulatory inspector is a counterpart to the licensee - should he be at least equally qualified?
- Has the licensee ever questioned the competence of an inspector? If so, informally or in a formal way, e.g. by a letter?

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How are training and qualification of inspectors documented?

- *Do you have written guidance instruments for initial and refresher training of inspectors?*
- *Do you demonstrate qualification measures and certificates to your government, to the public, or elsewhere?*

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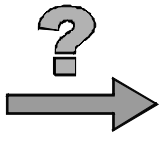
How are training and qualification of inspectors documented?

Responses differ widely. Many responses describe documented requirements for qualification, but not the documentation of performed training measures. What was the intention of the question?

- Individual records of courses and training measures
- central records for all inspectors, personalized data base
- training centre homepage (password protected)
- making statistics
- determine need for training
- open for external information on request
- not open for external information



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How are training and qualification of inspectors documented?

- Are there public expectations to be satisfied?
- Should competence and capability of the regulatory inspection authority be formally demonstrated?
- Internal documentation? Access?
- Who shall review the qualification of the regulatory body as an entity?

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Other important feature in the area of inspector training

- Which core competencies should the regulatory inspection authority have in house?
- Should an inspector be a specialist or a generalist?
- Which diversity of knowledge does a regulatory body need to manage TSO?
- What process are other countries using to identify emerging technical issues that may warrant inspector training?
- managers do not want training periods to be too long but there are always new skills and knowledge that inspectors should have.
- training and qualifications could be acknowledged internationally so that regulatory inspectors could more easily work in other countries
- Methods to certify the inspector's proficiency
- Tools to evaluate the inspector's performance

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Nuclear Energy Agency
Important features in the area of inspector training
We are looking forward
to successful group discussions !
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3.3 Integration of Inspection Findings

Staffan Forsberg and Francois Rinfret provided the results of the survey.

Integration of Inspection Findings

WGIP 1-5 June

Haikko Finland

S. Forsberg

F. Rinfret

Survey

2. Describe the assessment process by your regulatory body preferably on a schematic (pages max) by indicating
   a) types of inputs
   b) who assembles the inputs
   c) what frequency of integration
   d) describe the methodology, specifically including the role of inspection findings.

2. Describe the assessment process by your regulatory body by indicating
   a) types of inputs
   - Inspections
   - Safety performance indicators
   - Licensees event reports
   - Licensees periodic reports
   - Enforcement actions
   - Special evaluations (HF, Safety Culture)
   - Resident inspector reports (expert org.)
   - Interviews

2. Describe the assessment process by your regulatory body by indicating

b) who assembles the inputs

- Inspectors
- Mixed team, assessment groups
- Specialist

2. Describe the assessment process by your regulatory body by indicating

c) what frequency of integration

- 10 countries make an annually integrated safety assessment
- 5 countries make every 6 month an integrated safety summery
- 6 make quarterly summery
- 2 make fuel cycle summary
- 1 make continuously summery

3. How are the results of the periodic assessment:

a) Communicated to the licensee?

- Those that do a periodic assessment either meet with the licensee(5/14).
- Send report and/or a letter to the licensee (add 3/14).
- Publish the report and publicize it (add 4/14).
- A minority does not have this kind of communication with licensee or the public.

3. How are the results of the periodic assessment:

b) used by the regulatory body?

7 of 14 use the results of the assessment to:

- plan or budget
- modify inspection/regulatory action plan
- focus attention in the next cycle
- amend licenses

3. How are the results of the periodic assessment:

b) used by the regulatory body?

Specific Usage Noted:

- Trending a licensee
- Compare licensees
- Training of Inspectors
- Input to the next PSR (Periodic Safety Review)

4. Considering the method of integration of inspection findings in the periodic assessment of licensees, state:

its advantages:

- It involves staff from different disciplines, a balance and shared view on the licensee
- Different input are integrated, possibility of early detection of weak points
- Oversight process, risk informed, objective and predictive
- Focused, ensure attention and resources in the right area.

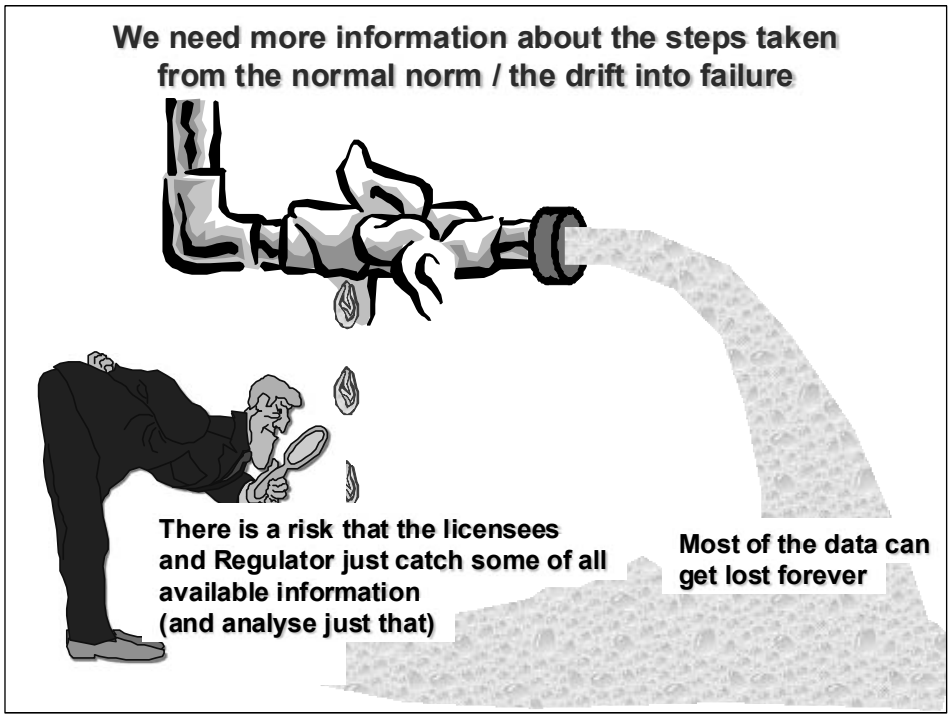
4. Considering the method of integration of inspection findings in the periodic assessment of licensees state:

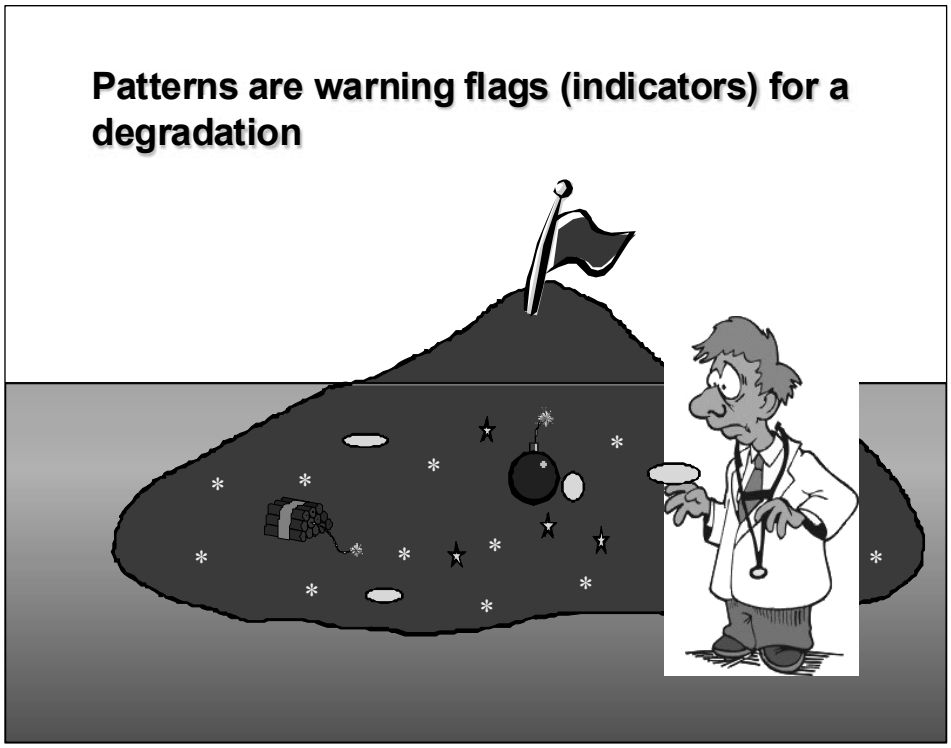
   Possible improvements:

   - Threshold level to give early warning
   - Safety culture issues
   - Less formal reporting, small deviations might be noticed.

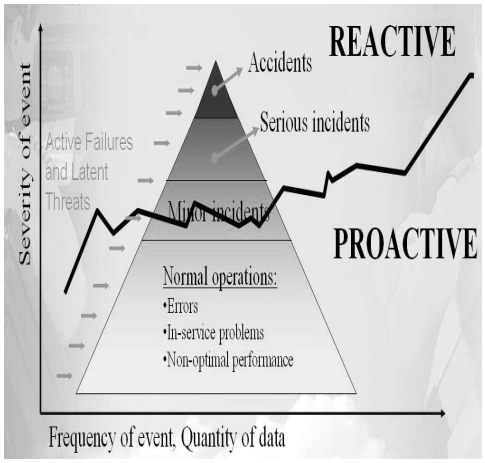
5. Issues suggested to be discussed

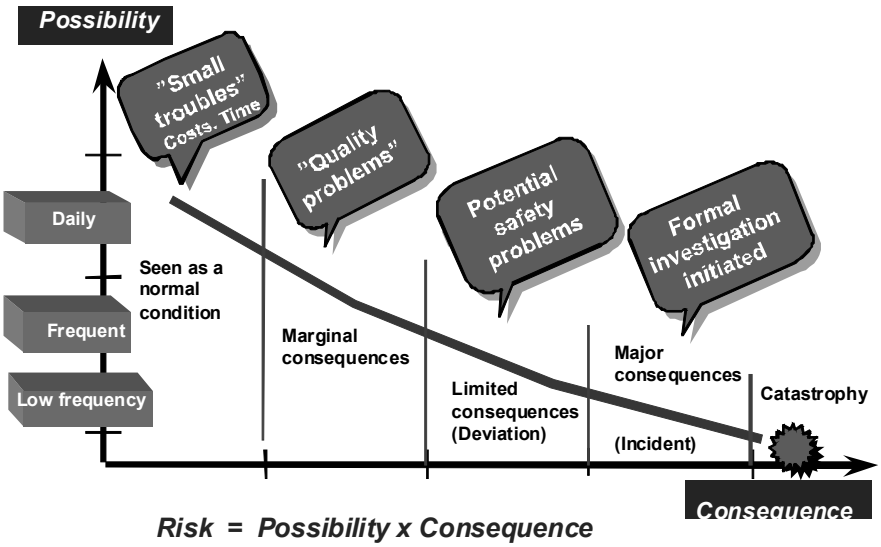
- Practices in other countries
- Use of PSA (imposing penalties)
- Integration from all findings to one safety assessment
- Criteria for safety determination
- Collection of qualitative data
- Measurement of regulatory effectiveness
- Communication of the result (comprehensive picture)


We need more information about the steps taken from the normal norm / the drift into failure
There is a risk that the licensees and Regulator just catch some of all available information (and analyse just that)
Most of the data can get lost forever


Patterns are warning flags (indicators) for a degradation

Reactive or proactive culture





Swedish Air Force Safety Department

3.4 Inspections of New Plants under Construction

Mr. Kobetz and Mr. Stockmann prepared the opening presentation. They noted that the number of new nuclear power plants being constructed throughout the world increases. The objective of this workshop was to allow participants to exchange ideas on Commendable Inspection Practices that may be implemented by regulatory authorities. While several participating countries are planning to begin construction on new plants, four participating countries (Finland, France, Japan, and Korea) are currently constructing new plants.

The presentation summarised a review of the information provided by the participants before the workshop. This included an overview of available experience, the scope of the inspection programmes, a discussion on when pre-operational testing is considered complete, the structure of inspection organisations and other areas that should be considered for inspection. The following slides were presented:

Inspection of Plants under Construction

CNRA Working Group on Inspection Practices

June 2, 2008

Discussion Areas

- What the questions responses told us
- What else did the responses identify
- What other questions should we be asking

Available Experience

- Varies
  - based on Country
    - Some countries have investigated how many resources they need for New build (Mexico)
    - Finland: 1 NPP, 400-1100 inspection days increasing per year by STUK, not include Inspection organizations
    - Korea: 150 experts, Japan 336
  - Based on Activity
    - Refurbishment
    - Waste Storage
    - Nuclear Plant/Research Reactors

Do inspection activities cover 100% of component and structure?

- No
- All focus on Safety Significance
  - Category of Components
  - System Safety Function
- Methods to select safety systems/components vary
  - Deterministic
  - Probabilistic Risk Assessment
  - Ability to detect an Error by other Means
  - Operational Experience
  - Complexity
  - Random Sampling

When is Pre-Operational Testing Complete

- Answers Varied
- Agencies Review and Agree on Scope of Tests Completed Satisfactorily
  - Some do it before the Test
  - Some do it after the Test
  - Some do both
- Safety Grade Components Tested Satisfactorily
  - New Vendors
  - Complexity

Organizational Structure

- Inspection Organizations are usually similar to Operating Reactors
- Some Differences
  - More resident Inspectors
    - Possibly more specialized
  - Special Project Managers
  - Dedicate Support from Agency Headquarters

What Else shoud we Possibly Consider

- Some Agencies use a Combined Licensing Process and some use a Staged Process
- Operational Inspection may need to be enhanced during Construction Inspection
- Safety Culture of Construction Activities
- Inspection of Operational Programs
- How do we Determine if Our Organizations are Ready
- Inspection of Licensee Subcontractors and Vendors
- Impact on Inspectors Interactions with other, possibly competing, Oversight Organizations
- Variations between Inspection of New Technology versus Old Technology
- Interactions with Stakeholders

A Lot to do With Little Time

- Questions
- Process Suggestions and Recommendations to how to conduct this Breakout Session

4. DISCUSSION GROUPS – SUMMARY OF RESULTS

4.1 Training and Qualifying of Inspectors

4.1.1 Discussion Groups

GROUP 1	GROUP 2
Daniel Billeter, Switzerland *	Hartmut Klonk, Germany *
Julio Crespo, Spain *	Jong-Tae Ha, Korea *
Mats Häggblom, Sweden *	Luis Miguel Gutierrez, Mexico *
Takehiro Otsuka, Japan	Zdenek Tipek, Czech Republic
Roland Obrecht, Germany	Aurelie Clavier, France
Patrick Arends, The Netherlands	Andrzej Mikulski, Poland
Kaisa Koskinen, Finland	Milka Holopainen, Finland
* WGIP Members	

4.1.2 Group Discussions

The presentation given at the Opening Session summarized a review of the information given by the participants before the workshop (see Appendix to the Proceedings). The most common features as well as some of the dominant differences were pointed out. These differences gave rise to additional questions, which were used by both groups to trigger the discussion during the breakout sessions.

Both groups discussed the main features of the subject. Commendable Practices were developed in both groups as they met separately for two half days. At the end of the third half day the groups joined to mutually comment on their conclusions.

Several duplications were identified and could be easily combined. Other conclusions and commendable practices fit well together and were mutually acknowledged by both groups.

General principle

A Systematic Approach to Training (SAT) should be developed within the regulatory body (RB). As for other processes it is recommended to apply the standard quality circle "Plan – Do – Check – Act" (PDCA) also to the implementation and review of the training of inspectors.

Recruitment

It is common to all participant countries to recruit persons with a university background in different fields of engineering, physics, chemistry, or similar qualifications. Further discussions conclude that formalized entrance qualification may be beneficial and mandatory in some countries, but every individual person is specific in his personal experience, background and expertise. Individual adjustments are to be considered. In addition to technical qualifications the job of an inspector requires other skills as well. The following Commendable Practice was identified:

For recruiting inspectors the RB includes requirements on non-technical skills such as soft skills and writing skills.

Initial Training

It is evident that the work of an inspector requires a certain amount of initial training in order to prepare for all expected situations in his job. On the job training is considered most effective. The following conclusions were drawn and were identified as Commendable Practices:

- Goals and rules for the on-the-job training (OJT) should be defined.
- Training is most effective by accompanying an experienced inspector.
- Initial training period depends on the individual background of the candidate. Duration of training itself is not important, more important are the issues of inspections observed. Related experience should be documented
- Role play of inspection situations and feed back (also by using video recording) may be a useful method to increase personal inspection capability.
- All OJT should be evaluated.
- The development of soft skills should be included in the basic (initial) training, e.g.:
  - writing capabilities,
  - basic elements of psychology relevant for inspectors,
  - social competence,
  - interrogative techniques,
  - human factor influence,
  - organizational factors,
  - influence of inspections on inspected people,
  - negotiation techniques,
  - communication techniques.
- Some countries have hired a psychologist or human behaviour specialist as expert on reviewing and inspecting on management system and HOF. This person is considered helpful also for training the other inspectors.

- The development of practice on how to communicate with the licensee is important.

- Basic knowledge of the RB strategy and rules how to relate and communicate with public administration, organs of government, parliament and media is beneficial.

One group discussed using cooperation between the licensee and the RB for training of future inspectors. By such means and under mutual agreement of both sides, e.g., RB personnel could be immersed for several weeks at a NPP to get knowledge of technical and organisational features for the operation of NPPs. This practice was considered very efficient as to the training of all related technical knowledge, but there was no agreement on identifying it as a commendable practice. Future relation between the RB and the licensee could be influenced in a way which may not be appropriate.

Continuous Training

Both groups found it important that training has to be continued as the inspector carries out his duties. There was a common understanding that such training should not be formalized as a re-training to be taken place in fixed intervals and with fixed training issues. Rather a strong support for motivation to constant learning should be given by the management of the RB. One country reported on a successful practice giving incentive by promotion or salary increase.

The objective for such continuous learning is the following conclusion, which was identified as a commendable practice:

- Competence and qualification of both senior licensee personnel and inspectors have to be at a comparable high standard, but must take into account their different tasks and responsibilities.

Several conclusions were drawn and agreed by both groups:

- Additional training is needed when an inspector carries out an inspection on another plant with a different type of reactor.

- Inspector training can be effectively supported by using simulation (own computing capabilities, nuclear power plant simulator) or other tools.

- Training courses offered for licensee personnel are useful for inspectors as well.

Further commendable practices were identified in the area of continuous training:

- There should be a program for continuous training within the RB, with assurance of sufficient time and budget.

- Inspection experience exchange (and feed back) between inspectors should be promoted. This could be accomplished by, e.g.,:

  - Temporary job rotation (in house change of role) of inspectors,
  - Exchange of (resident) inspectors between NPPs,
  - Cross inspections.

- There should be feedback requested from licensees on their perception of the work of the inspectors. This feedback should be analyzed whether it is relevant for the training of inspectors

One country reported on performing a research project to get qualified feedback from the licensee. A set of in-depth interviews was planned and executed at several levels of the plant organisation. The results were reviewed and evaluated, conclusions drawn and related lessons learned were implemented. By such feedback an important contribution to improve training of the inspectors can be implemented.

Review and documentation of training and qualification

It was concluded by most participants that a review of training activities is important. It was also recognized, that any improvement in the effectiveness of inspection is not easy to determine. The public and the parliament may expect regularly information on the qualification and competence of the regulatory body. Two commendable practices were identified:

- A review of inspectors training and qualification system should be done periodically. This could be done
  - within an IRRS-mission, or by
  - a special governmental auditing entity, or by
  - a certification body.
- The annual report of the RB gives information on training and qualification of inspectors.

Other important features

Several conclusions were drawn on other aspects related to the qualification and continuous training of inspectors. In some countries regulatory bodies involve Technical Support Organisations either for special tasks or regularly to support inspection or even to perform inspections. In such cases, inspection personnel of the regulatory body should have generalists' competence and broad knowledge to take most advantage of the expertise called in by using TSOs.

As for looking to safety culture of NPPs operating organisation, the safety culture of the regulatory body itself should be of great importance also for the inspectors.

Two commendable practices were identified:

- If there is a TSO involved in inspection, the RB should have enough competences to review the work of it.
- To look for evidence of safety culture in the RB: Raise and answer the same kind of questions as put to the licensee about safety culture issues.
- An evaluation of inspectors performance should be done periodically by, e.g.,
  - review of the work of inspectors by supervisors or senior inspectors, or
  - self assessment by RB.

International exchange is an important source of knowledge. The work within WGIP and within this workshop is part of this exchange. The members of WGIP are called to share their knowledge gained by this work with their fellow inspectors in their home country.

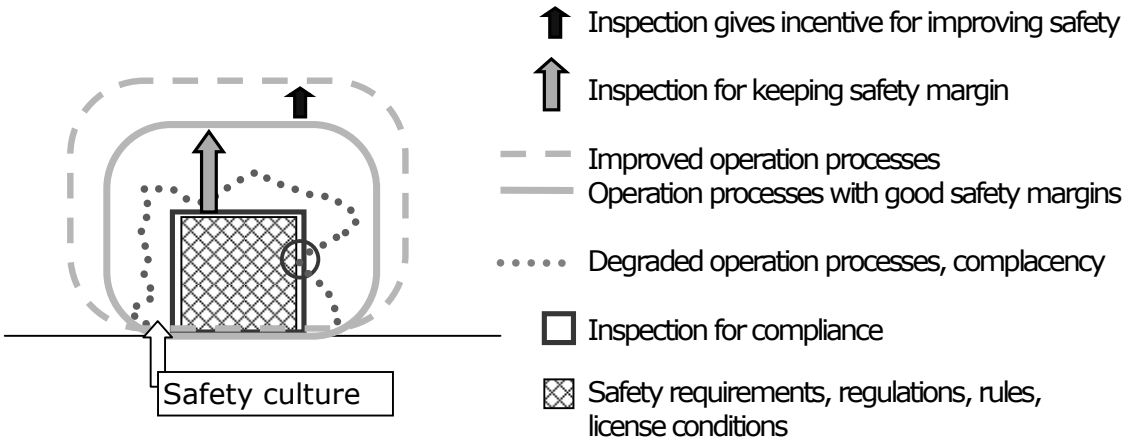
Observations were made:

- International exchange of inspection experiences contribute to inspectors qualification and training (international organisations, bilateral and multilateral co-operation)
- International bench-marking of inspection processes according to some scenarios may be considered.

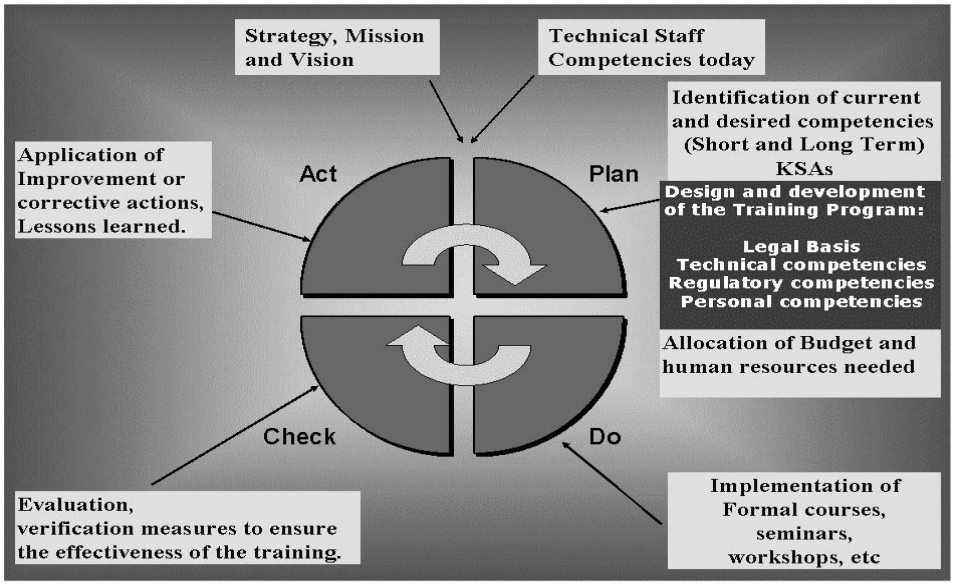
Inspection objectives to enhance Safety Culture

To inspect for safety culture and safety management is a special task and requires certain additional competencies. On the other hand, all inspectors can look for evidence or for early signs of declining safety culture by using their own good common sense.

One group discussed a figure which could clarify the effect of a good safety culture and the contribution of regulatory inspection on it.



Quality Management of Inspector Training Process



4.2 Integration of Inspection Findings

4.2.1 Discussion Groups

GROUP 1	GROUP 2
Staffan Forsberg, Sweden *	François Rinfret, Canada *
Walter Glöckle, Germany *	Benoit Zerger, France *
Gavin Smith, United Kingdom	Hirozo Shiomi, Japan *
Ramon De La Vega, Spain	Walter Kim, Korea
Andreas Leupin, Switzerland	Ludwig Schäffler, Germany
Walter Bergbauer, Germany	Werner Koch, The Netherlands
Kirsi Levä, Finland	Brian Finigan, Canada
Jussi Heinonen, Finland	Ann-Mari Sunabacka-Starck, Finland
	Seija Suksi, Finland
* WGIP Members	

4.2.2 Group Discussions

While Group 1 participants discussed the need for the integration of inspection findings, possible methods and content of these integrations, Group 2 participants spent considerable time discussing current practices and their rationale within the framework of their regulatory bodies (RB). RBs have very different practices regarding:

- The scope of inspections since some RBs limit their review to the results of periodic inspection of components;
- Contributing organisations to inspections, since having different levels of government involved into inspections makes it difficult to build an integrated and complete picture of the quality of NPP operation;
- Reporting mechanisms;
- The structure of inspection observations, facts and finding;
- The integration of softer (behavioural and cultural) observations into reports, as different pragmatic techniques were shared during the workshop that integrate human factors into their summaries of inspection findings. In particular, use of the Komfort tool was discussed, as well as a Questionnaire posed as a basis to seek uniformity in assessments of behaviours and cultural aspects.

The discussions in the working groups showed that in most countries, inspection findings are regularly evaluated but not necessarily integrated. Typically, this takes shape in anticipation of an annual meeting or during the evaluation that results in the drafting of an annual report. Many RBs are using or developing safety performance indicators which are included in the evaluation.

Groups 1 and 2 subsequently compared notes, discussed common areas and came up with the following salient and common views.

For the purposes of this report only, we shall refer to the result of the regular ***integration of inspection findings*** as an ***integrated safety assessment***.

Specific commendable practices are made as to the frequency of integrations, the use of performance indicators and the development of an overall rating.

<u>Demand for Regular Integration of Inspection Findings</u>

Among others, recognized driving forces and purposes for doing an integration of inspection findings are:

- to get a uniform view within the RB;
- to pay more attention to human and organizational aspects;
- to pay attention to possible weak points (to track them, to use trending);
- to make “feelings” measurable;
- to address symptoms for weak safety culture;
- to assemble the findings from different organizations into a common document.

Process for Delivering an Integrated Safety Assessment

The processes for the integrated evaluation of inspection findings in the RB depend on the reasons why this is done (e.g. internal communication, benchmarking etc.) and the products which are desired (e.g. annual report for the government, information for the public, internal planning etc.).

For the processes, it is important to define the inputs and the way they are gathered. The evaluation should supersede or go beyond the simplistic accumulation of single evaluations into a document. The evaluation should look at the information and the findings from an additional perspective, and re-map, in order to detect latent causes which are common in different areas or for different technical SSC. This may give hints on hidden issues, or the significant portion of an iceberg which lies beneath the water surface. Otherwise simple housekeeping issues may be indicative of a culture of disregard for safe working environment or the recognition of fire protection risks.

In order to recognize deeper causes of the inspection findings, the extent of condition for the detected findings should be known as well as the safety significance of those findings.

Finally, the requirement of the output of the evaluation process should be fixed. This is often done by using a given structure (table of content, criteria) for a report. To go beyond a listing of results, a questionnaire can be helpful. Open formulated questions may help to achieve formulations of concrete statements and judgements.

Commendable practices are drafted which recognize that a common framework is necessary for an integration in an effort towards consistency and repeatability, as well as predefined criteria for the data. Participants expressed that flexibility was necessary for the delivery of the inspection outputs to determine the extent of the conditions found as well as to enable remapping otherwise apparently independent findings to the right area. Participants agreed that RBs could rate safety significance and urgency of findings, to produce a more meaningful report.

General Requirements for the Integration of Inspection Findings:

- Multidisciplinary approach;
- Space for ideas / aspects which cannot be linked to objective criteria;
- Ongoing Communications (with the operating organization and within the RB).

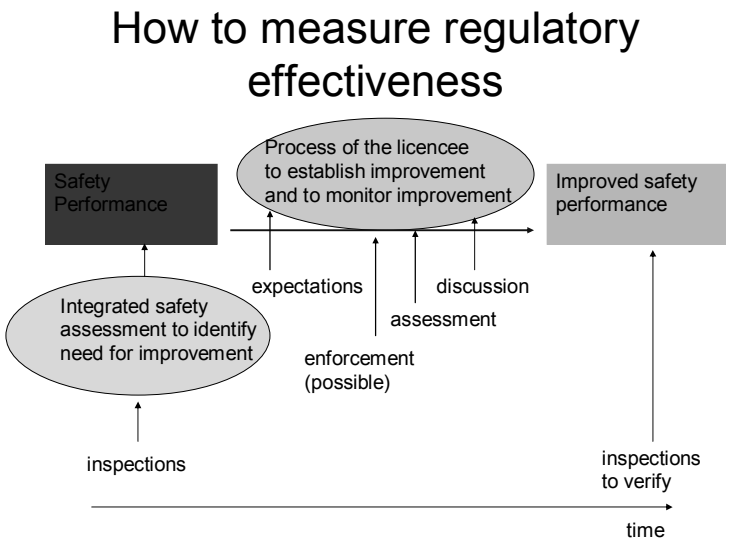
The three key elements above were seen as necessary ingredients to develop a meaningful integration of inspection findings. RB management must engage its staff from various disciplines, and in turn have an open dialogue with the operators. Despite the possible lack space for specific criteria or ideas within the current framework, RBs must create the space to generate the discussions.

Some of the considerations to the messages to be communicated from the results of the integrated safety assessment:

Coverage not limited to negative findings but also “good practices” in order to:

  - have a balanced picture of the safety level of the NPP;
  - improve safety (promote in order to foster improvements to other NPP, exchange experiences etc);
  - motivate the operator;
  - encourage continuous improvement;
- Make clear that it is the view of the RB;
- Be understandable for the public.

Measurement of regulatory effectiveness



The above figure, derived from discussions in one of the groups, suggests how regulatory inspections may be used to measure its effectiveness. It was recognized that measuring the effectiveness of regulatory bodies was itself another topic, which would be discussed in other venues.

The first few commendable practices in the Final Results section summarize the key points on how to integrate safety culture information in the report. A commendable practice identifies the possibility for RBs to develop pragmatic criteria to capture its organizational related findings.

The next commendable practices identify the benefit to developing balanced assessments, daring to discuss safety issues where only somewhat subjective criteria are available for the RB, and discuss improvement path as well as a follow up to improvement initiatives. Finally, a commendable practice is identified where experienced inspectors could assemble the assessments in areas such as safety culture.

Other discussions lead to commendable practices in the areas of inspector training, review of regulatory effectiveness: it is deemed commendable that actual assessments be reviewed to seek improvements to the content and message. Actual licensee event reports were seen as input material used to determine how the regulator could have detected the latent condition through its inspection function before the event occurred.

4.2.3 Final Results

The discussions reported in section 4.2.2 led the groups to design the following commendable practices:

1. The integration of inspection findings report (or integrated safety assessment) should not be restricted to weaknesses but also include the areas where the requirements are met or exceeded.

Purpose:

- to obtain a balanced picture of the safety level of the NPP
- to be understandable for the public
- to encourage continuous improvement

2. The integrated safety assessment should pay attention to possible weak points / possible trends which cannot be based on objective criteria.

Purpose:

- to get early warnings
- to be proactive
- to identify hidden weaknesses
- to consider the meaning of all information from inspections not just that which can be linked to defined inspection criteria.

3. The integrated safety assessment should be used to identify areas where improvements of the licensee‘s performance are needed.

Purpose:

- to use multiple information sources to ensure increased regulatory effectiveness

4. The integrated safety assessment should include the follow-up of the licensee‘s improvement actions.

Purpose:

- to ensure effectiveness of the licensee‘s improvement process
- and to determine the regulatory effectiveness

5. Safety culture aspects should be integrated into the integrated safety assessment by an experienced inspector or a team of inspectors. The information may originate e.g. from:

- symptoms and attributes of degradation of safety culture found by regulatory inspection
- safety culture self-assessment of the licensee
- in-depth analysis of findings.

Purpose:

- Importance of safety culture (cf. No. 2).

6a. The integrated safety assessment should be based on a pre-defined {tool, framework, model} and gather continuous data.

Purpose:

- That suggests flexibility, areas needing attention, and possible sources of feedback.

6b. RB inspectors should map (and re-map) technical findings to appropriate levels of the licensee organization, as signals to detect causes of latent risks or hidden issues, proactively.

6c. RB Inspectors should spend resources verifying extent of condition for given findings.

6d. RB should rate safety significance and urgency of findings, or assign appropriate weighing factors for the same purpose.

6e. RB should develop criteria (perhaps a questionnaire) for the evaluation and decision making leading to the drafting of the integrated safety assessment.

Purpose:

- In an effort for consistency and repeatability.

7a. RB should use criteria for organizational related findings.

7b. RB should train inspectors over actual integrated safety assessments or annual reports.

Purpose:

- For increased consistency and benchmarking.

7c. Inspectors of the RB should learn to turn {organizational or soft skills} issues into findings within their regulatory context.

8a. RB should determine an overall safety {rating, level} for the licensees in the integrated safety assessment.

Purpose:

- As the ultimate integration and final decision.

8b. RB should produce an integrated safety assessment on an annual basis (or based on refuelling cycle) that captures both technical issues and organizational issues.

8c. RB should understand the limits, develop and use a good number of meaningful and solid regulatory performance indicators (RPIs) within the integrated safety assessment.

Purpose:

- For trending purpose, and to focus inspection questions.

9. RB should perform post-licensee-event reviews to measure regulatory effectiveness and inspector detection capability.

Purpose:

- Could the event have been avoided, notwithstanding the responsibility of the RB?

4.3 Inspections of New Plants under Construction

4.3.1 Discussion Groups

GROUP 1	GROUP 2
Tim Kobetz, United States *	Ynte Stockmann, The Netherlands *
Gyula Fichtinger, Hungary *	Richard Rasmussen, United States
Masayoshi Kojima , Japan *	Aloysius Ling, Canada
David Derbyshire, United Kingdom	Segaud Marie, France
Paul Wong, Canada	Jun Sang Park, Korea
Brian Tooley, Canada	Nina Koivula, Finland
Rolandas Ciucelis, Lithuania	Mirka Schildt, Finland
Nina Lahtinen, Finland	Jouko Mononen, Finland
Jenni Laine, Finland	
* WGIP Members	

4.3.2 Group Discussions

The number of new nuclear power plants being constructed throughout the world increases. The objective of this workshop was to allow participants to exchange ideas on Commendable Inspection Practices that may be implemented by regulatory authorities. While several participating countries are planning to begin construction on new plants, four participating countries (Finland, France, Japan, and Korea) are currently constructing new plants.

The presentation given at the Opening Session summarized a review of the information provided by the participants before the workshop. This included an overview of:

- Available experience.
- The scope of the inspection programmes.
- A discussion on when pre-operational testing is considered complete.
- The structure of inspection organizations.
- Other areas that should be considered for inspection.

The two breakout groups were as follows:

At the conclusion of the two days of discussions the two groups assembled and discussed the Commendable Inspection Practices that each had identified. First the groups focused on commonalities and then sorted out how the differences should be resolved.

Scope of Constructions Inspections

To better identify the Commendable Inspection Practices the group began by defining that construction begins with the issuance of the Construction License and ends just prior to the first fuel movements into the reactor core.

Construction Activities that should be considered for Inspection

It was identified that inspections should assess whether the licensee/operator was ready to begin construction. This included reviewing their training programs for safety culture, performing nuclear work activities, the importance of quality assurance, communication practices, and performing special processes (e.g., welding, pipe fitting, and concrete construction).

The inspections should also evaluate the licensee/operator readiness to meet the demanding construction schedules. In addition, inspection programmes should assess vendor activities such as component fabrication and testing.

Lastly, the inspections must be performed during the pre-operational testing of safety related systems and components.

Regulatory and Inspection Preparation

All participants agreed that it is never too early to start planning. This included acquiring and maintaining sufficient inspector resources. Inspector training and knowledge transfer should be focused on long before construction activities begin. Two types of inspectors required for construction activities were identified: 1) Engineering Specialists (e.g., mechanical and civil engineers, and safety culture experts); and 2) Engineering Generalists (e.g., plant operations).

Several of the participating countries that are currently inspecting nuclear power plant construction noted that the communications protocol between the regulatory authority and the licensee/operator should be established early to avoid confusion and delays during construction activities. It was also noted that occasionally the unavailability of regulatory authority management for final decision making has delayed inspection activities.

The inspectors should identify mandatory inspection items early and implement hold points when necessary to avoid missing inspections or delaying construction activities.

Basis for Selection of Inspection Activities and inspector Focus

The groups identified that the following list should be considered during preparations for inspection activities:

- Legal requirements.
- Safety importance of the system or component.
- Risk-informed (probabilistic risk assessments).

- New technology, complexity, and novelty (e.g., the use of digital I&C).
- Review of design control.
- Exchange of inspection experience between regulators.
- Inspection timeliness to support construction schedule.
- Unavailability of systems or components to inspect later.
- Operational experience.
- Feedback from previous inspections.
- Codes and standards.
- Engineering judgement.

Conclusions and Commendable Inspection Practices

The groups agreed that the following must be evaluated when preparing to inspect and inspecting the construction of new plants under construction:

- Focus on the licensee's QA program early (especially the implementation).
- Ensure the inspectors are properly recruited and trained (both specialists and generalists).
- Establish appropriate criteria for the selection of inspection activities and necessary hold points (however, do not become critical path due to overly conservative decision making).
- It's never too early to start planning – Things move fast once construction begins and effective communications with the licensee are important.
- Regulatory agencies cannot over communicate with external stakeholders (additional resources may be required).
- Identify methods to determine whether the licensee has a sufficient safety culture.

5. CLOSING PLENARY SESSION

5.1 Presentation of Topics

A presentation on each of the workshop topics was made by the facilitators. Each presentation was followed by general questions and comments from the floor. Each of the groups developed a set of commendable inspection practices based on their discussions. *[Reference Chapter 4]*

Remark on "commendable practices": Commendable practices are extracts from the topics, which were discussed by the workshop participants and were thought to be reference for Member countries. These are neither international standards nor guidelines. Each country should determine inspection practices, considering its own historical, social and cultural backgrounds and the commendable practices can be useful reference when each country improves its inspection practices.

5.2 Closing Remarks

Mr. Lewis remarked on the success of the discussions. His impression was that there had been full and frank exchanges of views both during the plenary and break-out discussion sessions. He also noted that the informal sessions provided many additional opportunities for bilateral exchanges.

Discussions on the Workshop topics have shown that:

- These workshops for inspectors continue to provide a unique environment in which inspectors can exchange information on current issues to gain insights and to also validate their own processes.
- The topics were well developed and the participants were well prepared and made important contributions.
- The development of both commendable inspection practices and the development of new challenges to be faced were successful and participants and their national organisations would hopefully benefit from the insights gained.

In closing the work, Mr. Lewis thanked STUK, Radiation and Nuclear Safety Authority staff in particular the efforts of a few individuals who made major contributions. Timo Eurasto who co-ordinated all the organisation efforts as well as the technical contents of the workshop with the STUK staff, especially Ms. Maileena Alenius who helped put together all the various aspects of the programme and ensured the success by their diligence to all the many details involved. Mr. Lewis also thanked Mr. Barry Kaufer (OECD/NEA secretariat) for his continued service to the Working Group on Inspection Practices, which included support from NEA, all organisational aspects for the groups programme of work and for the group meetings and workshops.

In concluding, Mr. Lewis thanked all the workshop participants, facilitators and recorders remarking that without their contributions, hard work, dedication and commitment the Workshop would not have been a success.

6. CONCLUSIONS

6.1 General Workshop Conclusions

The following conclusions emerged from the workshop (Note - These conclusions and the accompanying commendable practices are based on workshop discussions and do not reflect a consensus NEA opinion. Nevertheless, they can be utilised as a general benchmark for basic comparisons of those issues which inspectors from participating countries share):

The following subsections provide a listing of the commendable inspection practices that evolved from the various group discussions.

6.2 Commendable Inspection Practices

6.2.1 Training and Qualifying of Inspectors

1. For recruiting inspectors the RB includes requirements on non-technical skills such as soft skills and writing skills.

Initial Training

2. Goals and rules for the on-the-job training (OJT) should be defined.

3. Training is most effective by accompanying an experienced inspector.

4. Initial training period depends on the individual background of the candidate. Duration of training itself is not important, more important are the issues of inspections observed. Related experience should be documented.

5. Role play of inspection situations and feed back (also by using video recording) may be a useful method to increase personal inspection capability.

6. All OJT should be evaluated.

7. The development of soft skills should be included in the basic (initial) training.

8. Some countries have hired a psychologist or human behaviour specialist as expert on reviewing and inspecting on management system and HOF. This person is considered helpful also for training the other inspectors.

9. The development of practice on how to communicate with the licensee is important.

10. Basic knowledge of the RB strategy and rules how to relate and communicate with public administration, organs of government, parliament and media is beneficial.

Continuous Training

11. Competence and qualification of both senior licensee personnel and inspectors have to be at a comparable high standard, but must take into account their different tasks and responsibilities.

12. There should be a program for continuous training within the RB, with assurance of sufficient time and budget.

13. Inspection experience exchange (and feed back) between inspectors should be promoted.

14. There should be feedback requested from licensees on their perception of the work of the inspectors. This feedback should be analyzed whether it is relevant for the training of inspectors.

Review and documentation of training and qualification

15. A review of inspectors training and qualification system should be done periodically.

16. The annual report of the RB gives information on training and qualification of inspectors.

Other important features

17. If there is a TSO involved in inspection, the RB should have enough competences to review the work of it.

18. To look for evidence of safety culture in the RB: Raise and answer the same kind of questions as put to the licensee about safety culture issues.

19. An evaluation of inspectors performance should be done periodically.

6.2.2 Integration of Inspection Findings

1. The integrated safety assessment should not be restricted to weaknesses but also include the areas where the requirements are met or exceeded.

2. The integrated safety assessment should pay attention to possible weak points / possible trends which cannot be based on objective criteria.

3. The integrated safety assessment should be used to identify areas where improvements of the licensee‘s performance are needed.

4. The integrated safety assessment should include the follow-up of the licensee‘s improvement actions.

5. Safety culture aspects should be integrated into the integrated safety assessment by an experienced inspector or a team of inspectors.

6a. The integrated safety assessment should be based on a pre-defined {tool, framework, model} and gather continuous data.

6b. RB inspectors should map (and re-map) technical findings to appropriate levels of the licensee organization, as signals to detect causes of latent risks or hidden issues, proactively.

6c. RB Inspectors should spend resources verifying *extent of condition* for given findings.

6d. RB should rate safety significance and urgency of findings, or assign appropriate weighing factors for the same purpose.

6e. RB should develop criteria (perhaps a questionnaire) for the evaluation and decision making leading to the drafting of the integrated safety assessment.

7a. RB should use criteria for organizational related findings.

7b. RB should train inspectors over actual integrated safety assessments or annual reports.

7c. Inspectors of the RB should learn to turn {organizational or soft skills} issues into findings within their regulatory context.

8a. RB should determine an overall safety {rating, level} for the licensees in the integrated safety assessment.

8b. RB should produce an integrated safety assessment on an annual basis (or based on refuelling cycle) that captures both technical issues and organizational issues.

8c. RB should understand the limits, develop and use a good number of meaningful and solid regulatory performance indicators (RPIs) within the integrated safety assessment.

9. RB should perform post-licensee-event reviews to measure regulatory effectiveness and inspector detection capability.

6.2.3. Inspections of New Plants under Construction

The groups agreed that the following must be evaluated when preparing to inspect and inspecting the construction of new plants under construction:

1. Focus on the licensee's QA program early (especially the implementation).

2. Ensure the inspectors are properly recruited and trained (both specialists and generalists).

3. Establish appropriate criteria for the selection of inspection activities and necessary hold points (however, do not become critical path due to overly conservative decision making).

4. It's never too early to start planning – Things move fast once construction begins and effective communications with the licensee are important.

5. Regulatory agencies cannot over communicate with external stakeholders (additional resources may be required).

6. Identify methods to determine whether the licensee has a sufficient safety culture.

7. EVALUATION

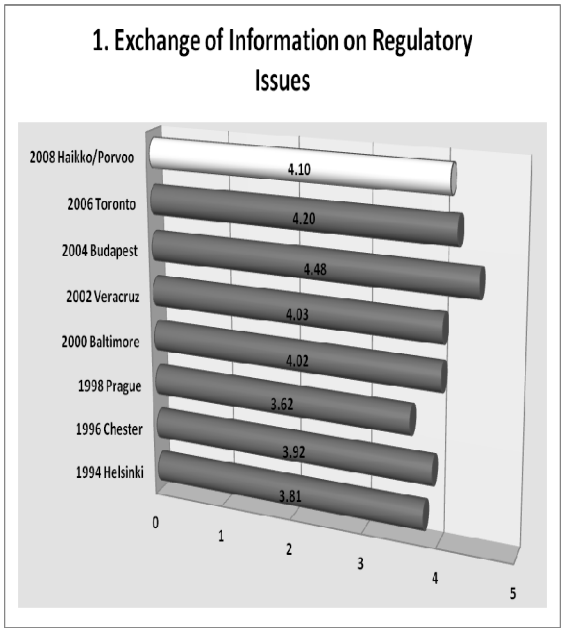
7.1 Evaluation Form

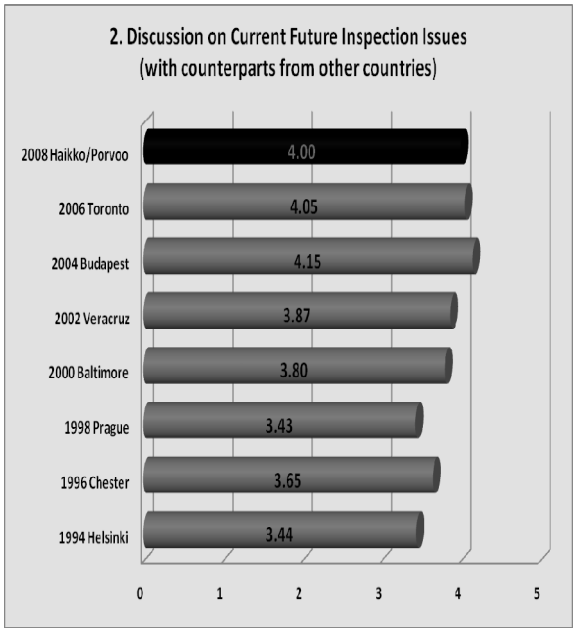
All participants at the workshop were requested to complete an evaluation form. The results of this questionnaire summarised below, are utilised by WGIP in setting up future workshops and to look at key issues for in the programme of work over the next few years. Of the 53 total participants 43 responses were received.

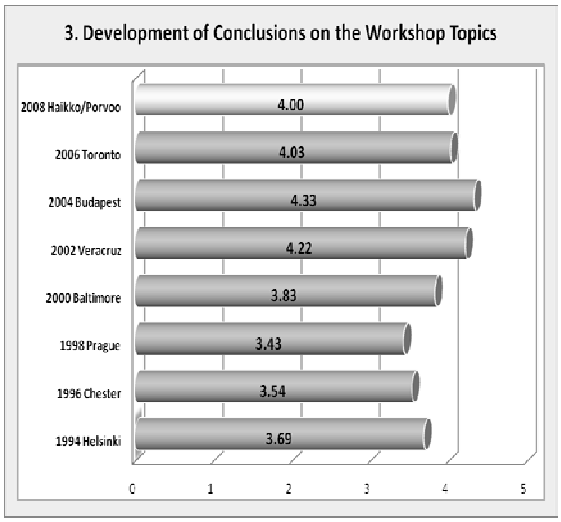
The evaluation form, which was similar to ones issued at previous workshops, asked questions in 4 areas: general - workshop objectives, workshop format, workshop topics and future workshops. Participants were asked to rate the various questions on a scale of 1 to 5 (with 1 being a low (poor) score and 5 being a high (excellent) score. Results are provided in the following charts (which also reflect scores from the previous workshops - for comparison purposes) along with a brief written summary.

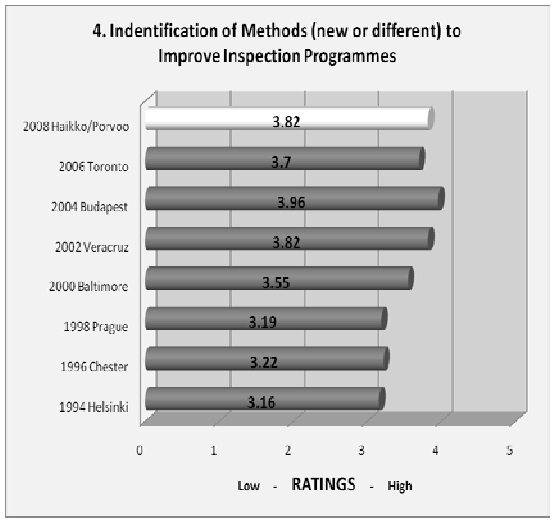
7.2 General

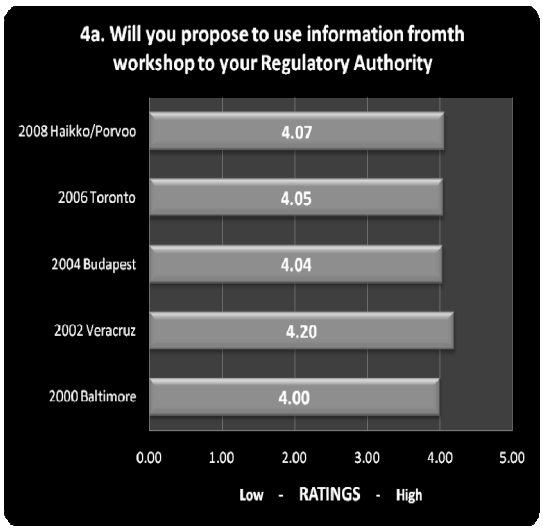
Each of the following charts depicts a specific objective of the workshop and the participant's responses on how well they were met.

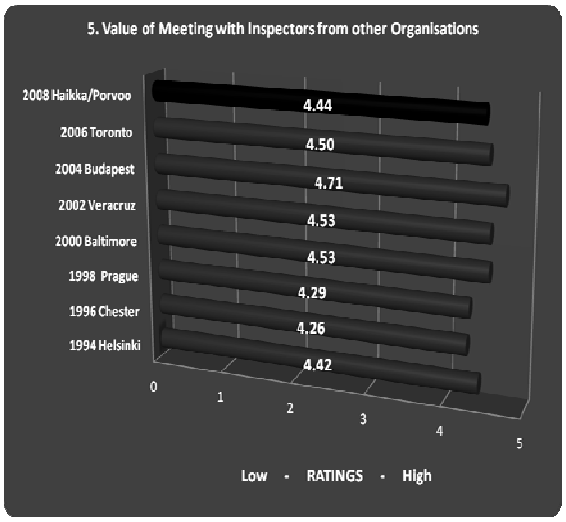








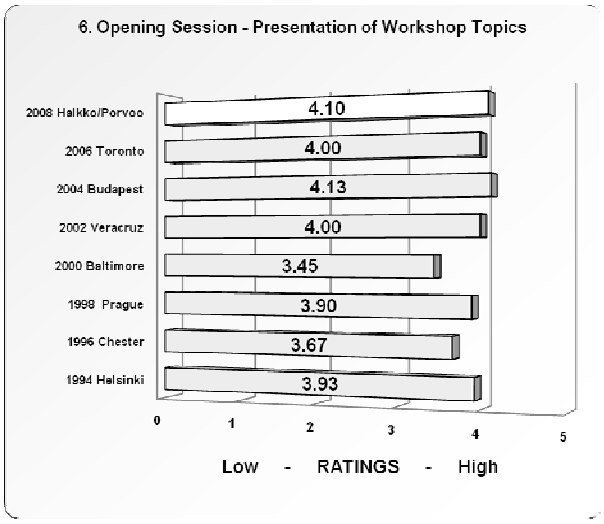


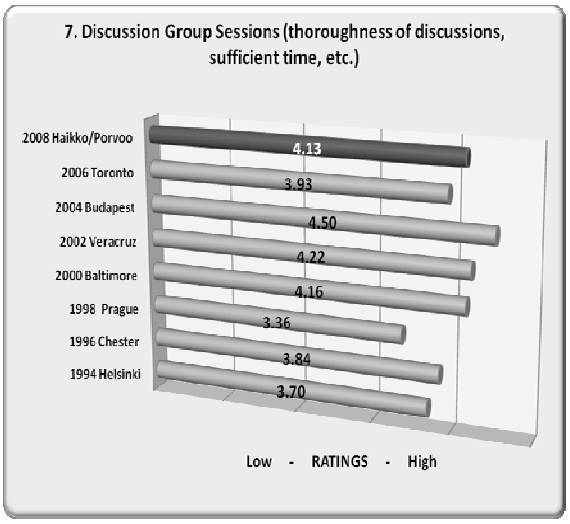


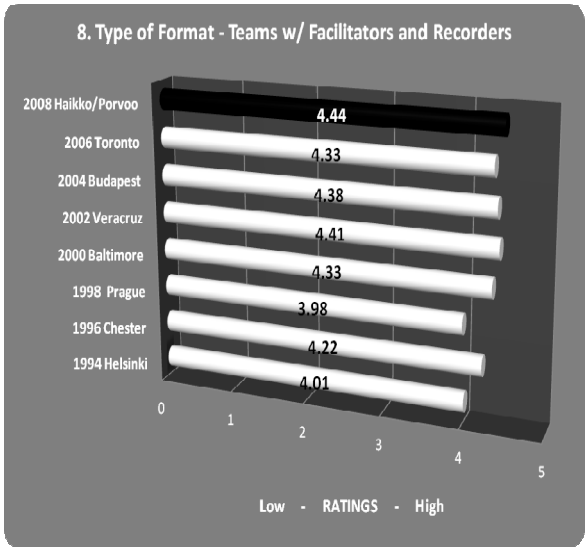
The results are comparable with last three Workshops, which reached the highest history rating in the most of these six specific objectives, when the responses to questions 1, 2, 4, 4a and 5 show that not only do participants find the exchange of information valuable, but were able to identify issues and methods to use in improving their own inspection programmes.

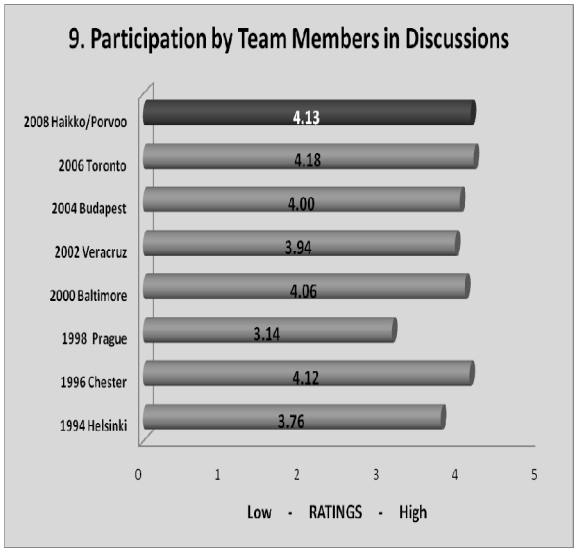
7.3 Workshop Format

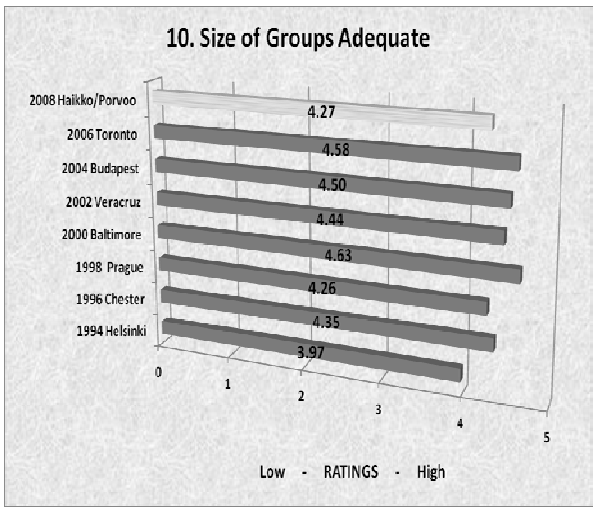
This part of the questionnaire looked at how effective each of the sessions was. The main objective of this question focuses on the way sessions are conducted. The responses provide key information to WGIP in their preparation and planning for future workshops.

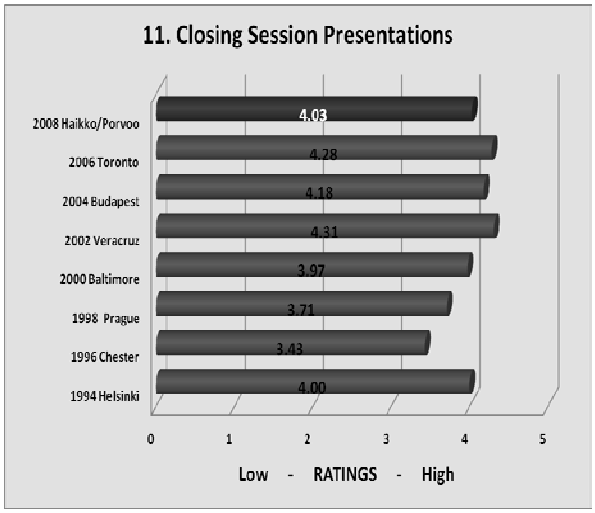

6. Opening Session - Presentation of Workshop Topics
2008 Haikko/Porvoo
2006 Toronto
2004 Budapest
2002 Veracruz
2000 Baltimore
1998 Prague
1996 Chester
1994 Helsinki
4.10
4.00
4.13
4.00
3.45
3.90
3.67
3.93
0
1
2
3
4
5
Low - RATINGS - High


7. Discussion Group Sessions (thoroughness of discussions, sufficient time, etc.)
2008 Haikko/Porvoo
2006 Toronto
2004 Budapest
2002 Veracruz
2000 Baltimore
1998 Prague
1996 Chester
1994 Helsinki
4.13
3.93
4.50
4.22
4.16
3.36
3.84
3.70
Low - RATINGS - High


8. Type of Format - Teams w/ Facilitators and Recorders
2008 Haikko/Porvoo
2006 Toronto
2004 Budapest
2002 Veracruz
2000 Baltimore
1998 Prague
1996 Chester
1994 Helsinki
4.44
4.33
4.38
4.41
4.33
3.98
4.22
4.01
0
1
2
3
4
5
Low - RATINGS - High


9. Participation by Team Members in Discussions
2008 Haikko/Porvoo
2006 Toronto
2004 Budapest
2002 Veracruz
2000 Baltimore
1998 Prague
1996 Chester
1994 Helsinki
4.13
4.18
4.00
3.94
4.06
3.14
4.12
3.76
0
1
2
3
4
5
Low - RATINGS - High

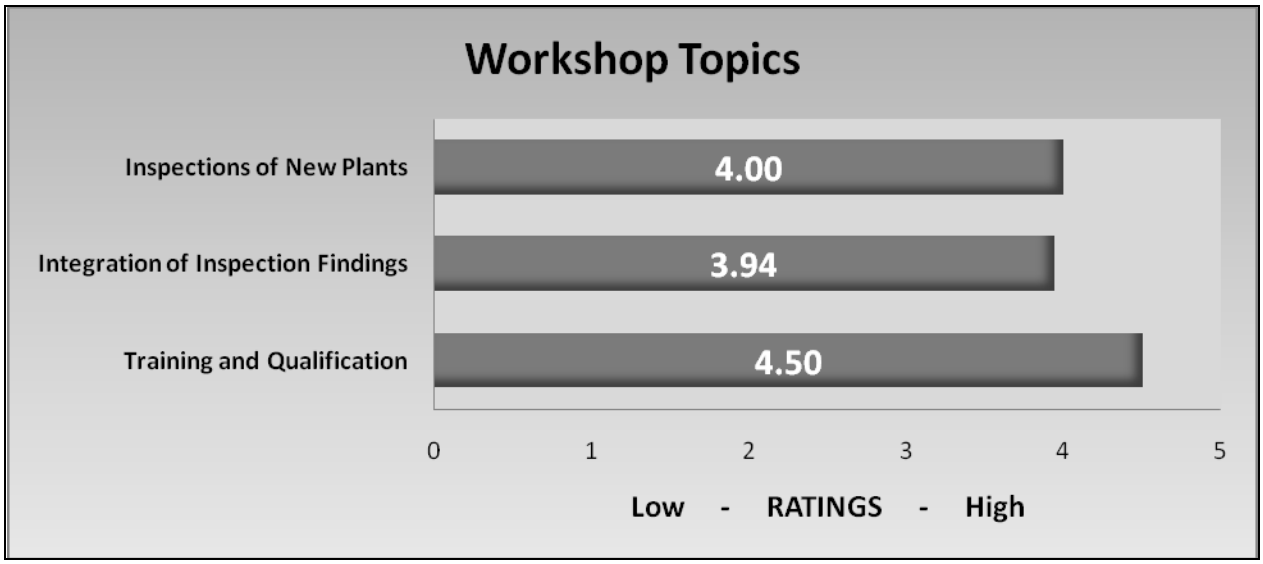




The results are again as in the previous area among the best in all WGIP workshops history. They confirm that WGIP members have become more efficient in preparing and running the workshop. The success of each workshop is dependent on good preparation by the WGIP and co-ordination between the facilitators and recorders for each topic. As discussed in previous proceedings, social interaction outside the workshop sessions clearly enhances the discussions.

7.4 Workshop Topics

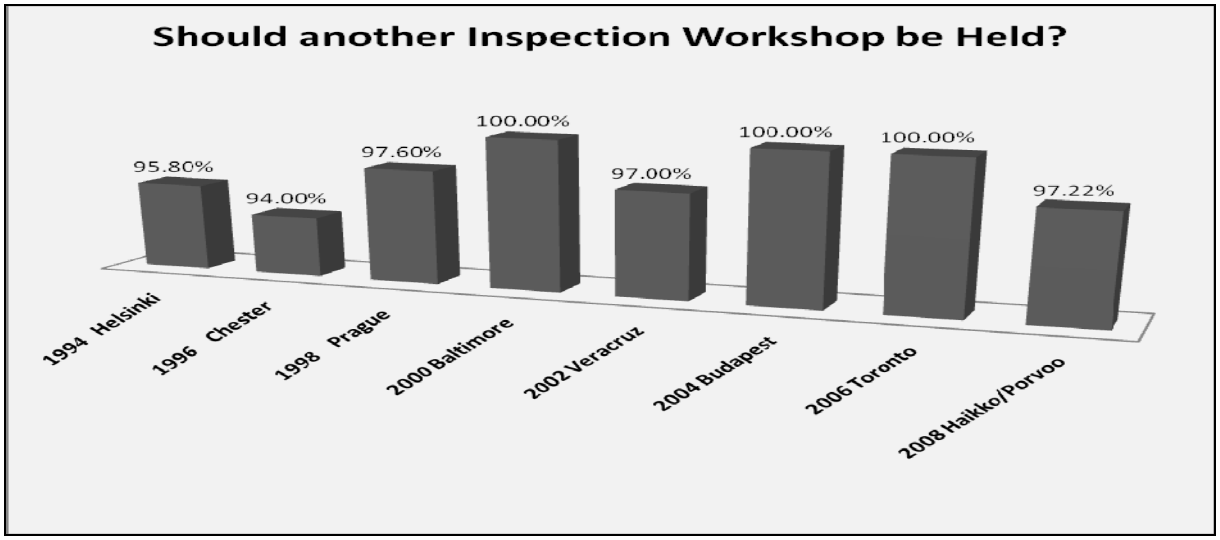
In order to assess how well the topics have been addressed, participants are asked to give a rating on whether they perceived the topics were covered adequately.

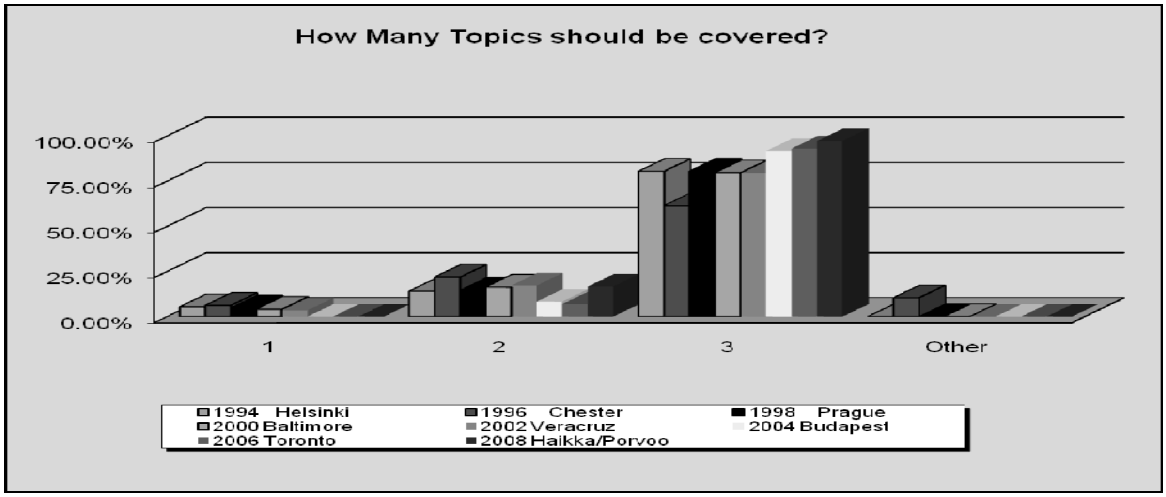


Workshop participants were generally satisfied with the selection of topics and how they were addressed. The scores recorded were similar to past workshops and the importance of training and qualification of inspectors is clearly depicted.

7.5 Future Workshops

While section 7.3 looks at the way workshop sessions are conducted, this section provides a perspective of the type of format, the overall value of having workshops and how they can be bettered.





Workshop participants who responded were unanimous in endorsing future workshops. The results show that most participants also agree with the existing format regarding the number of topics and the length of the workshop.

7.6 Future Topics

Participants were asked to provide their input on potential future topics. Over 25 topics were listed in the responses. While no specific analysis was applied to the results, WGIP and the CNRA will evaluate these and use them in proposing topics for future workshops. Some of more frequently mentioned topics (randomly listed not prioritised) were as follows:

- Inspection of Ageing , Life Extension (4)
- Self Assessment of Regulatory Body (Effectiveness of Inspection Prgormames) (2)
- Inspection of NuclearTransports
- Inspection of NPP Processes (process-oriented inspections) (4)
- Lessons Learnt from Inspections (feedback)(4)
- Reduced Outages
- Inspection of Safety Culture (4)
- Risk Based Inspections
- Human Performance Inspections (2)
- Code of Conduct for Inspectors
- Inspectioning QA/QM (2)
- Regulatory Body Organisation Structure for Inspectors (2)

- Inspection of Subcontractors (2)
- Inspection of Plant Modifications
- Inspection of Research Reactors
- Multinational Inspections
- Balance between regulators tools (licensing, inspection, evaluation)
- Inspection of mechanical components and maintenance (3)
- Inspection of events and incidents (2)
- Communication of Inspection Results (3)
- Benchmarking on reaction towards significant event

Additional Comments Received

General Questions 1-5)

- Very well organised
- A specific time should be identified to gather the results of the 2 groups (groups should get together before facilitators begin putting together final results.
- Participants were very knowledgeable and willing to share information.

Workshop Format (Questions 6-11)

- Lack of time for panel discussions (4) – One suggestion that it would be more effective to have separate group presentations at the end, which would allow more discussion.
- Would like to handouts of presentations in advance (2)
- Broad range of countries in the groups was good.
- Format is good, lots of people contributed.
- Could use more time to develop the combined conclusions.
- Session leader should act as Chair not as member of the group.
- The Learning attitude could have been stronger. Challenge is to learn from others.
- Good format, but still very dependent on persons and their communication skills. Need to make sure several people do not dominate the talking and allow all to speak.

Workshop Topics (Questions 12-14)

- Topics covered were interesting, even if some were difficult.
- Including topic related to new build was positive.
- Better balance was needed in groups on integration of inspection findings.

Other Comments

- Good practice for groups is to start with short introductions to national practices on the basis of the survey responses.
- Difficulties to merge the findings of the 2 groups which can cause totally different views of the topic.
- Keep presentations short.
- Excellent organisation by STUK (3).

APPENDIX - LIST OF PARTICIPANTS

CANADA

FINIGAN, Brian
Site Supervisor
CNSC
Pickering Nuclear Station,
Montgomery Park Road,
Pickering, Ontario
Tel: +1 905-831-3536
Fax: +1 905-831-9849
Eml: finigan.b@cnsc-ccsn.gc.ca

KAMESWARAN, Ram
Canadian Nuclear Safety Commission
Director of Assessment & Analysis
Systems Engineering Division
280 Slater Street
Ottawa, Ontario K1P 5S9
Tel: +1 613 943 8169
Fax: +1 613 995 5086
Eml: ram.kameswaran@cnsc-ccsn.gc.ca

LING, Aloysius
Inspector, Supervisor
Darlington Nuclear Gen Station
CNSC
P.O, Box 4000
Bowmanville, Ontario, L1C3Z8
Tel: +1 905-697-7430 ext 1951
Fax: +1 905-623-5963
Eml: al.ling@cnsc-ccsn.gc.ca

RINFRET, Francois
Director, Reactor Inspection Division
Directorate of Power Reactor Regulation
280 Slater, PO Box 1046
Postal Station B\
Ottawa K1P 5S9
Tel: +1 613 996 2193
Fax: +1 613 943 0253
Eml: rinfretf@cnsc-ccsn.gc.ca

TOOLEY, Brian
Inspector
CNSC
Darlington Site Office
P.O. Box 4000
Bowmanville, Ontario L1C 3Z8
Tel: +1-905-623-6670 x1955
Fax: +1-905-623-5963
Eml: brian.tooleyb@cnsc-ccsn.gc.ca

WONG, Paul
Canadian Nuclear Safety Commission
280 Slater Street
Ottawa, Ontario K1P 5S9
Tel: +1 613 992 2750
Fax: +1 613 995 5086
Eml: paul.wong@cnsc-ccsn.gc.ca

CZECH REPUBLIC

TIPEK, Zdenek
State Office for Nuclear Safety
NPP Temelin Local Inspectorate
Temelín - Elektrárna, 37305
Tel: +420 385 735 288
Fax: +420 385 783 667
Eml: zdenek.tipek@sujb.cz

FINLAND

EURASTO, Timo
Senior Inspector
Radiation & Nuclear Safety Authority
Laippatie, 4
P.O. Box 14
FIN-00881 Helsinki
Tel: +358 9 759 88 345
Fax: +358 9 759 88 382
Eml: timo.eurasto@stuk.fi

HEINONEN, Jussi
Radiation and Nuclear Safety Authority
STUK
P.O. Box 14$
FIN-00881 Helsinki
Tel: +358 9 759 88 679
Fax: +358 9 759 88 670
Eml: jussi.heinonen@stuk.fi

HOLOPAINEN, Milka
Scientist
Nuclear Reactor Regulation
Radiation and Nuclear Safety Authority-ST
P.O. Box 14
FIN-00881 Helsinki
Tel: +358 9 7598 8687
Fax: +358 9 7598 8382
Eml: milka.holopainen@stuk.fi

KOIVULA, Nina
Radiation and Nuclear Safety Authority
Laippatie 4
00881 Helsinki
Tel: +358 400 420 556
Fax: +358 9 759 88 382
Eml: nina.koivula@stuk.fi

KOSKINEN, Kaisa
Radiation and Nuclear Safety Authority
Nuclear Reactor Regulation
Laippatie 4
P.O. Box 14
FIN-00881 Helsinki
Tel: +358 9 7598 322
Fax: +358 9 7598 8388
Eml: Kaisa.Koskinen@stuk.fi

LAHTINEN, Nina
Radiation and Nuclear Safety Authority
(STUK)
Nuclear Reactor Regulation
Laippatie 4 , P.O.Box 14
FIN-00881 Helsinki
Tel: +358 09 759 88 319
Fax: +358 09 759 88 382
Eml: nina.lahtinen@stuk.fi

LAINE, Jenni
Radiation & Nuclear Safety Authority (STUK)
Laippatie, 4
P.O. Box 14
FIN-00881 Helsinki

Tel: +358 9 759 88 707
Fax: +358 0 759 88 382
Eml: jenni.laine@stuk.fi

LEVA, Kirsi
Radiation and Nuclear Safety Authority
Laippatie 4
00881 Helsinki

Tel: +358 9 759 88 606
Fax: +358 9 759 88 382
Eml: Kirsi.Leva@stuk.fi

MONONEN, Jouko
STUK - Radiation and Nuclear Safety Authority
PL/P.O. Box 14
Laippatie 4
00881 Helsinki

Tel: +358 9 759 881
Fax: +358 9 7598 8382
Eml: jouko.mononen@stuk.fi

SCHILDT, Mirka
Radiation and Nuclear Safety Authority
Nuclear Reactor Regulation
Laippatie 4
00881 Helsinki

Tel: +358 9 759 88 505
Fax: +358 0 759 88 382
Eml: mirka.schildt@stuk.fi

SUKSI, Seija
Radiation and Nuclear Safety Authority
Nuclear Reactor Regulation
Laippatie 4
P.O. Box 14
FIN-00881 Helsinki

Tel: +358 9 759 88347
Fax: +358 9 759 88382
Eml: seija.suksi@stuk.fi

SUNABACKA-STARCK, Ann-Mari
Radiation & Nuclear Safety Authority
Laippatie, 4
P.O. Box 14
FIN-00881 Helsinki

Tel: +358 40 5104 008
Fax: +358 9 759 88 382
Eml: ann-mari.sunabacka-starck@stuk.fi

FRANCE

CLAVIER, Aurelie
ASN
6, place du Colonel Bourgoin
75572 Paris Cedex 12

Tel: +33 (0)1 40 19 88 98
Fax: +33 (0)1 40 19 87 90
Eml: aurelie.clavier@asn.fr

SEGAUD, Marie
Autorité de Sûreté Nucléaire (ASN)
10, rue du Panorama
92266 Fontenay-aux-Roses Cedex

Tel: +33 1 43 19 70 80
Fax: +33 1 43 19 70 66
Eml: marie.segaud@asn.fr

ZERGER, Benoît
ASN
DRIRE
2 rue Antoine Charial
69426 Lyon Cedex 03

Tel: +33 04 37 91 43 80
Fax: +33 04 37 91 28 04
Eml: benoit.zerger@asn.fr

GERMANY

BERGBAUER, Walter
TÜV Bau und Betrieb GMbH
Westendstrasse 199
D-80686 München

Tel: +49 89 57911238
Fax: +49 89 57912606
Eml: walter.bergbauer@tuev-sued.de

GLÖCKLE, Walter
Umweltministerium Baden-Württemberg
Postfach 10 34 39
D-70029 Stuttgart

Tel: +49 711 126 2607
Fax: +49 711 126 2885
Eml: walter.gloeckle@um.bwl.de

KLONK, Hartmut
Bundesamt für Strahlenschutz
Fachbereich Sicherheit in der Kerntechnik
Fachgebiet SK 1
Willy-Brandt Str. 5
Postfach 100149
38201 Salzgitter

Tel: +49 3018-333-1530
Fax: +49 3018-333-1885/3018-10-333-1530
Eml: hklonk@bfs.de

OBRECHT, Roland
Referat 52
Umweltministerium
Baden-Wuerttemberg
7000 Stuttgart

Tel: +49 (711) 126 2953
Fax: +49 (711) 126 2885
Eml: Roland.Obrecht@uvm.bwl.de

SCHÄFFLER, Ludwig
Bayerisches Staatsministerium
für Landesentwicklung und Umweltfragen
(Bavarian Ministry of Environment)
Rosenkavalierplatz 2
D-81925 Munich

Tel: +49 89 9214 2272
Fax: +49 89 9214 2286
Eml: ludwig.schaeffler@stmlu.bayern.de

HUNGARY

FICHTINGER, Gyula
Hungarian Atomic Energy Authorities
Nuclear Safety Directorate
Fenyes A.U. 4
114 Pf. 676
H-1036 Budapest 114

Tel: +36 1 4364 894
Fax: +36 1 3464 883
Eml: fichtinger@haea.gov.hu

JAPAN

KOJIMA, Masayoshi
TOKYU REIT Toranomon Bldg
3-17-1 Toranomon
Minato-ku
Tokyo 1005-0001
Tel: +81 3 4511 1300
Fax: +81 3 4511 1497
Eml: kojima-masayoshi@jnes.go.jp

OTSUKA, Takehiro
Inspection Affairs Division
Japan Nuclear Energy Safety (JNES)
TOKYU REIT Toranomon Bldg.
3-17-1, Toranomon, Minatoku,
Tokyo, 105-0001
Tel: +81 3 4511 1310
Fax: +81 3 4511 1497
Eml: otsuka-takehiro@jnes.go.jp

SHIOMI, Hirozo
Senior Researcher & Safety Information
Analysis Group, Safety Information Resea
Japan Nuclear Energy Safety Organisation
3-17-1, Toranomon, Minatoku,
Tokyo, 105-0001
Tel: +81 3 4511 1940
Fax: +81 3 4511 1998
Eml: shiomi-hirozo@jnes.go.jp

KOREA (REPUBLIC OF)

HA, Jong-Tae
Korea Institute of Nuclear Safety (KINS)
P.O. Box 114
Yusong, Taejon
Tel: +82 42 868 0212
Fax: +82 42 861 0943
Eml: jongha@kins.re.kr

KIM, Walter
Korea Institute of Nuclear Safety (KINS)
19, Gu-seng
Yu-Song, Daejon
Tel: +82 42 868 0226
Fax: +82 42 861 0943
Eml: wtkim@kins.re.kr

PARK, Jun Sang
Senior Researcher
Reactor Safety Evaluation Department
Korea Institute of Nuclear Safety
P.O. Box 114
Yusung, Taejon, 305-600
Tel: +82-42-868-0221
Fax: +82 42 861 2535
Eml: k306pjs@kins.re.kr

LITHUANIA

CIUCELIS, Rolandas
State Nuclear Power Safety Inspectorate
(VATESI)
Licensing Division
Gostauto, 12
LT-01108 Vilnius
Tel: +370 698 88097
Fax:
Eml: r.ciucelis@vatesi.lt

SLEPAVICIUS, Sigitas
State Nuclear Power Safety Insectorate
(VATESI)
Licensing Division
Gostauto, 12
Vilnius

Tel: +370 5 266 1572
Fax: +370 5 261 4487
Eml: s.slepavicius@vatesi.lt

MEXICO

GUTIERREZ RUIZ, Luis Miguel
Comision Nacional de Seg.
Nuclear y Salvaguardias CNSNS
Dr. Barragan 779, 3° Piso
Col. Narvarte
CP. 03020 Mexico DF

Tel: +52 55 5095 3236
Fax: +52 5 55 905 3293
Eml: lgutierrez@cnsns.gob.mx

NETHERLANDS

ARENDS, Patrick
Nuclear Safety Inspector
Ministerie Vrom IPC 560
VI/KFD
Rijnstraat 8
Postbus 16191
2500 BD Den Haag

Tel: +31 70 3391974
Fax: +31 70 3391887
Eml: patrick.arends@minvrom.nl

KOCH, Werner
Nuclear Safety Inspector
Ministerie Vrom IPC 560
VI/KFD
Rijnstraat 8
Postbus 16191
2500 BD Den Haag

Tel: +31 70 3391943
Fax: +31 3391887
Eml: werner.koch@minvrom.nl

STOCKMANN, Ynte
Nuclear Safety Inspector
Ministerie Vrom IPC 560
VI/KFD
Rijnstraat 8
Postbus 16191
2500 BD Den Haag

Tel: +31 70 339 1503
Fax: +31 70 3391887
Eml: ynte.stockmann@minvrom.nl

POLAND

MIKULSKI, Andrzej T.
Department of Nuclear and Radiaton Safety
National Atomic Energy Agency
ul. Krucza 36
00-921 Warszawa

Tel: +48 (2) 2 695 9805
Fax: +48 (2) 2 695 9846
Eml: Andrzej.Mikulski@paa.gov.pl

SPAIN

CRESPO, Julio
Consejo de Seguridad Nuclear
C/ Justo Dorado, 11
28040 Madrid

Tel: +34 91 3460 242
Fax: +34 91 3460 588
Eml: jcb@csn.es

DE LA VEGA, Ramon
CSN
C/ Justo Dorado 11
28040 Madrid

Tel: +34 91 3460 789
Fax: +34 91 3460 588
Eml: rvr@csn.es

SWEDEN

FORSBERG, Staffan
Swedish Radiation Safety Authority
Stralsakerhetsmyndigheten
S-17116 Stockholm

Tel: +46 8 6988 431
Fax: +46 8 6619086
Eml: staffan.forsberg@ssm.se

HAGGBLOM, Mats
Swedish Radiation Safety Authority
Stralsakerhetsmyndigheten
S-17116 Stockholm

Tel: +46 8 698 84 23
Fax: +46 8 661 90 86
Eml: mats.haggblom@ssm.se

SWITZERLAND

BILLETER, Daniel
Coordinator for KKG
Hauptabteilung für die Sicherheit
der Kernanlagen (HSK)
5232 Villigen-HSK

Tel: +41 0 56 310 39 35
Fax: +41 + 41 0 56 310 38 54
Eml: daniel.billeter@ensi.ch

LEUPIN, Andreas
Hauptabteilung für die Sicherheit
der Kernanlagen (HSK)
CH-5232 Villigen-HSK

Tel: +41 56 310 39 32
Fax: +41 56 310 39 07
Eml: andreas.leupin@ensi.ch

UNITED KINGDOM

DERBYSHIRE, David
HSE Nuclear Installations Inspectorate
Redgrave Court Bld 4N.2
Bootle, Merseyside
L20 7HS

Tel: +44 0151 951 4825
Fax: +44 0151 951 4163
Eml: dave.derbyshire@hse.gsi.gov.uk

LEWIS, Stephen
Nuclear Installation Inspectorate
Nuclear Directorate/HSE
4.N.2 Redgrave Court
Merton Road
Merseyside L20 7HS

Tel: +44 151 951 3784
Fax: +44 151 951 4821
Eml: steve.nsd.lewis@hse.gsi.gov.uk

SMITH, Gavin
HSE Nuclear Installations Inspectorate
Redgrave Court
Merton Road
Bootle, Merseyside L20 7HS

Tel: +44 151 951 3733
Fax:
Eml: gavin.smth@hse.gsi.gov.uk

UNITED STATES OF AMERICA

KOBETZ, Timothy
US Nuclear Regulatory Commission
Mailstop O-12-D-3
Washington, DC 20555

Tel: +1 301 415 1932
Fax: +1 301 415 3031
Eml: timothy.kobetz@nrc.gov

RASMUSSEN, Richard
Chief, Construction Inspection Branch
US NRC
14409 Harvest Moon Road,
Boyds, MD 20841

Tel: +1 301-415-1340
Fax:
Eml: rar@nrc.gov

INTERNATIONAL ORGANISATIONS

OECD Nuclear Energy Agency

KAUFER, Barry
OECD-NEA / Nuclear Safety Division
Le Seine St-Germain
12 bd des Iles
F-92130 Issy-les-Moulineaux
France

Tel: +33 1 45 24 10 55
Fax: +33 1 45 24 11 29
Eml: barry.kaufer@oecd.org