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Organisation de Coopération et de Développement Economiques
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NUCLEAR ENERGY AGENCY
COMMITTEE ON NUCLEAR REGULATORY ACTIVITIES

NEA/CNRA/R(2007)1
Unclassified

8TH INTERNATIONAL NUCLEAR REGULATORY INSPECTION WORKSHOP ON HOW REGULATORY INSPECTIONS CAN PROMOTE, OR NOT PROMOTE, GOOD SAFETY CULTURE, INSPECTION OF INTERACTIONS BETWEEN THE LICENSEE AND ITS CONTRACTORS, AND FUTURE CHALLENGES FOR INSPECTORS (E.G., NEW TECHNIQUES, DEVELOPING COMPETENCE, ETC.).

PROCEEDINGS

1st – 3rd May, 2006, Toronto, Canada
Hosted by the Canadian Nuclear Safety Commission (CNSC)

English text only

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ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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

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

The original Member countries of the OECD are Austria, Belgium, Canada, Denmark, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The following countries became Members subsequently through accession at the dates indicated hereafter: Japan (28th April 1964), Finland (28th January 1969), Australia (7th June 1971), New Zealand (29th May 1973), Mexico (18th May 1994), the Czech Republic (21st December 1995), Hungary (7th May 1996), Poland (22nd November 1996), Korea (12th December 1996) and the Slovak Republic (14 December 2000). The Commission of the European Communities takes part in the work of the OECD (Article 13 of the OECD Convention).

NUCLEAR ENERGY AGENCY

The OECD Nuclear Energy Agency (NEA) was established on 1st February 1958 under the name of the OEEC European Nuclear Energy Agency. It received its present designation on 20th April 1972, when Japan became its first non-European full Member. NEA membership today consists of 28 OECD Member countries: Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Luxembourg, Mexico, the Netherlands, Norway, Portugal, Republic of Korea, 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 8TH International Workshop held by WGIP on regulatory inspection activities.

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

- How regulatory inspections can promote, or not promote, good safety culture,
- Inspection of interactions between the licensee and its contractors, and
- Future challenges for inspectors (e.g., new techniques, developing competence, etc.).

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 eighth 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 Workshop addressed the following three (3) main topics concerning inspection activities:

- How regulatory inspections can promote, or not promote, good safety culture,
- Inspection of interactions between the licensee and its contractors, and
- Future challenges for inspectors (e.g., new techniques, developing competence, etc.).

Members of Organising Committee wish to acknowledge the excellent planning and arrangements made by the staff of the hosting organisation Canadian Nuclear Safety Commission (CNSC), in particular Mrs. Fran Edwards, Mr. Brant McNeish and Mr. Francois Rinfret. Dr. Hartmut Klonk, 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.

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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.

Fifty-four (54) participants from eighteen (18) different countries and one international organisation took part in the workshop (Appendix 1). Countries included: Belgium, Canada, Czech Republic, Finland, France, Germany, Hungary, Japan, Korea, Mexico, Netherlands, Russian Federation, Slovak Republic, Spain, Sweden, Switzerland, the United Kingdom, the United States and an observer from the International Atomic Energy Agency (IAEA).

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 where 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 eighth in a series, of International Workshops on Regulatory Inspection Activities began following the conclusion of the previous workshop in Budapest, Hungary, in May 2004. Formal planning started following approval by the CNRA at its annual meeting in December 2004.

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 Canadian Nuclear Safety Commission (CNSC) and held at the Sheraton Centre Toronto Hotel in Toronto, Canada from 1st to 3rd May 2006.

2.3 Topics

Participants at the last workshop [reference: NEA/CNRA/R(2005)4/5] 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 2005 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 How regulatory inspections can promote, or not promote, good safety culture

Strong compliance based regulation just delivers absolute compliance. The attributes of a mature organization, however, are that it develops a self-learning and developing approach.

It is important that a regulatory body carries out its inspections in a way that promotes this attitude and does not inadvertently upset it.

This workshop topic has been adopted to allow inspectors to discuss and determine a) where we should carry out inspection, and b) how we inspect, such that our actions and behaviour promote this positive attitude rather than disrupt it.

2.3.2 Inspection of interactions between the licensee and its contractors

The use of contractors at nuclear plants is increasing, with a possible dilution of the knowledge base. Recent incidents have highlighted the importance of maintaining a close eye on contractors. Verification steps by the regulator and licensee must be planned, controlled and evaluated. At the same time difficulties in the interaction between the regulator, licensee and contractor have been experienced. The workshop will review the issue and determine some commendable practices when dealing with this interface.

2.3.3 Future challenges for inspectors (e.g., new techniques, developing competence, etc.)

Continuous development of nuclear activities, such as new technologies like digital I&C, organisational changes and financial effects of deregulation are some examples of current and new challenges for inspectors.

This requires continuous adjustments in the regulatory inspection programme, including the inspected items, used methodologies and required competence available to the regulator.

This process must be made possible by the country's legal regulatory system and by the guarantee of necessary resources. A regulator's self assessment programme should include the development of expertise based on investigations to define regulatory needs.

Inspectors will review the current situation and determine opportunities to address these future challenges.

2.4 Announcement

The workshop announcement was transmitted in the fall of 2005. 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. Dr. Hartmut Klonk chaired this session. Dr. Klonk 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. J. K. Pereira, Executive Vice President, Canadian Nuclear Safety Commission (CNSC) 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 Canadian Nuclear Safety Commission, Ontario Power and Bruce Power presented current information on the Canadian IRRS-project, Canadian inspection practices at Bruce NPP, the Bruce A refurbishment programme and a proposed deep geological waste disposal facility close to the Bruce NPP site.

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 Darlington Nuclear Generating Station (four units 935 MWe CANDU-reactors). Staff members of the plant operation organisation provided an introduction and a guided tour of the facility.

3. OPENING SESSION

3.1 Welcoming Remarks

Dr. Klonk, 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. They all might be imprisoned by these restrictions. Dr. Klonk encouraged the participants to take away all these national regulatory particularities, and to find the essence, the ideas, the philosophy of regulatory inspection. It is this essence which effectively can be shared with each other. He expressed his hope that the participants were able to find many valuables to be considered for their own work at home.

He also stated that the topics were very relevant and discussed in all countries and international organisations. He noted the excellent participation and expressed his hope for meaningful discussions and successful workshop.

Mr. Kaufer provided a short introduction and Dr. Klonk 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. Lewis (How regulatory inspection can promote, or not promote, good safety culture), Mr. Stockman (Inspection of interaction between the licensee and its contractors) and Mr. Vandewalle (Future challenges for inspectors).

3.2 How Regulatory Inspections Can Promote, or Not Promote, Good Safety Culture

Mr. Steve Lewis presented the results of the questionnaire from the 15 member countries that responded. He noted that in June 1999 The OECD NEA Committee on Nuclear Regulatory Activities (CNRA) issued a Green Booklet entitled, “The Role of the Nuclear Regulator in Promoting and Evaluating Safety Culture”. Based on the replies to the questionnaire, in May 2006 it is not apparent that a lot of progress has been achieved forwarding the resulting years.

The results of the questionnaire indicated that:

- Some countries have not yet considered the topic even in its barest form.
- Other countries have considered the topic but have not developed it.
- Very few have begun the process of designing their inspection practices to take it into account.
- None have yet got a data set that allows them to make judgements.

Continuing, he stated that the purpose of this session of the workshop is to help member countries to gain an insight into this topic and establish processes in their own countries which will allow them to address it. It should be noted that Committee on the Safety of Nuclear Installations (CSNI) Special Expert Group on Human and Organisational Factors (SEGHOF)[1] is the NEA group that has the responsibility for giving advice on Safety Culture. WGHOF will hold a workshop shortly to allow human factors specialists to further develop regulators' understanding of Operators' safety culture. The focus of this workshop is to consider the inspectors impact on the operators safety culture.

In 1998, following the publication of the CNRA report on Future Regulatory Challenges, the CNRA established a Task Group to advance the discussion on how a regulatory organisation recognises and addresses safety performance problems that may stem from safety culture weaknesses. The earlier referred to green book is the first of a series of reports produced by the Task Group and focused on early signs of declining safety performance, and the role of the regulator in promoting and evaluating safety culture.

The report was prepared by Dr. Thomas E. Murley, from input provided by the members of the Task Group: Dr. Serge Pretre (Chairman, Switzerland); Mr. Samuel J. Collins (United States); Dr. Michael Cullingford (United States of America); Dr. Klaus Kotthoff (Germany); Mr. Philippe Saint Raymond (France); Mr. Mike Taylor (Canada); Mr. Christer Viktorsson (Sweden); Mr. Christopher Willby (United Kingdom), Mr. Paul Woodhouse (United Kingdom); Mr. Roy Zimmerman (United States) and Dr. Gianni Frescura (OECD Nuclear Energy Agency).

The green book noted that the term safety culture resulted from the post Chernobyl review and the INSAG report 1991 used to report its findings defined safety culture as:

> "**……. that assembly of characters and attitudes in organisations and individuals which establishes that, as an overriding priority, nuclear plant safety issues receive the attention warranted by their significance**."

Continuing, he noted that Safety Culture involves everybody who can influence nuclear safety. That is operators, regulators, contractors, governments. The Chernobyl accident showed that "lack of a safety culture can lead to operator behaviour which breaches multiple barriers of the entire defence-in-depth safety fabric. That is, when the basic safety values, norms and attitudes of an entire organisation are weak or missing, then one can have procedures ignored, operating limits exceeded and safety systems bypassed, no matter how well they have been designed and built."

This workshop topic has been adopted to allow inspectors to discuss and determine:

a) where we should carry out inspection, and

b) how we should inspect, such that our actions and behaviour promote this positive attitude to safety rather than disrupt it.

Strong compliance based regulation just delivers absolute compliance. The attributes of a mature organization, however, are that it develops a self-learning and developing approach. It is important that a regulatory body carries out its inspections in a way that promotes this attitude and does not inadvertently upset it.

[1] Subsequent to the workshop, the name of this group has changed to Working Group on Human & Organisational Factors (WGHOF).

In concluding, he stated that success will be helped if all members of the group contribute to the work of the group this week.

3.3 Inspection of Interaction between the Licensee and its Contractors

Mr. Ynte Stockmann made a presentation on the background, an overview of the issue, and the survey questions and responses. He noted that WGIP and CNRA had performed extensive work in this area and the results of a previous survey are compiled in the CNRA report entitled, "Nuclear Regulatory Inspection of Contracted Work", NEA/CNRA/R(2003)4. As incidents continue to occur, it was agreed that this workshop should look further at the inspection aspects.

The definition of contracted work used in the 1993 survey was; "An independent company performing a design, maintenance, operation, test, installation or modification at the nuclear plant, on behalf of the licensee, by contract, or service for the licensee". Responses were received from twelve countries.

The results of the survey were as follows:

Regulatory Framework

Most countries answer that they have no direct authority over contractors, however:

- Certain components: Pressure vessel (Belgium, France)
- Plant construction companies (Korea)
- Right to inspect the contractors directly: Hungary, Korea,
- Right to inspect contractors removed recently in Slovak Republic

Inspection of the Interface between Licensee and Contractors

All countries require a quality assurance (QA) system in which licensee ensures quality of contracted work. The outcome is inspected as is the QA procedure. Most countries concentrate on inspecting the licensees QA system. A Few (Hungary, Korea) inspect QA of contractors directly. Many inspect on-site contractor performance during outage and also acceptance tests by licensee at contractor's site.

How does the Regulatory Body maintain confidence in the way Licensees control the work done by the contractors?

Many but not all inspect contractors on the spot. Some attend meetings between licensee and contractor. Most rely on licensees QA system which is spot checked according to a plan or reactive. This is done both actively during contractors work or totally based on records. Some inspect contractors abroad, but many treat foreign contractors differently from national ones.

Trend in the quality of the work and documents prepared by the contractors

No country indicates a systematic tracking of incidents that are contractor related. The responses noted that:

- increasing trend in incidents
- repetitive unqualified contractors
- certification of contractors doesn't guarantee quality
- electronic interface by licensee gives interface problems
- increased or improved documentation
- interface problems due to increased use of contractors
- licensees strict supervision avoids problems
- constant quality

Regulatory Authority over the Contractor

Most regulators indicated they have direct or indirect authority over contractors, some have none.

Incidents and Events

Many countries indicated increased number of incidents, but certainly not all. The Regulatory response is normally to demand increased supervision by the licensee

How does the Regulatory Body assure that safety related recommendations by contractors are assessed and implemented if necessary?

Most rely heavily on licensees QA system while others review systematically if recommendations have been implemented or even implemented by Regulatory decision

Additional Topics of Concern

- Experience exchange in general on inspecting contracted work, specifically on inspecting training qualification of contractors.
- How much, and how should the regulatory body be involved in the work of contractors? For example; supervision of work, training and qualification of contractors, on what basis should the Regulatory Body decide its involvement with contractors (e.g., size, nationality, operating experience, risk analysis, certification (by the Regulatory Body / Licensee / Users group / Non-nuclear,...), etc.
- How to guarantee that the licensee is an "intelligent customer" (from safety viewpoint)?

Workshop Tasks

Possible Division for discussions:

- NPP / FCF/RR
- Large/ small
- Safety relevance
- Manufacturing/ Engineering/ Service
- Possibility for tracking contractor related events

3.4 Future Challenges for Inspectors (e.g., New Techniques, Developing Competence, etc.)

Mr. André Vandewalle presented the results of the survey. Responses were received from 13 countries.

Future Challenges

These included general challenges (sociocultural changes), challenges related to the licensees (Economics, Organisation, Hardware (SS) and Software (people and activities)) and challenges related to inspection organisations (knowledge and changes in the inspection framework).

Sociocultural challenges reported by Finland, Belgium and France included safety culture, values, attitudes, behaviour and the gender issue.

Licensee challenges were reflected by many countries and included the following:

- On economics Spain and Belgium noted:
  - More competition – reduction of costs – use of (low cost) contractors
  - Financial aspects – investments - resources
  - International companies as owner
- Organisation challenges noted by France, Finland, Germany and Mexico included:
  - Safety management
  - Ageing management
  - Ageing of plant management (and other people)
  - Human factors

- Hardware challenges mentioned by most of the responding countries included:
  - New reactors
  - New facilities (waste treatment)
  - New technologies
  - Ageing – Obsolescence - Life extension
  - Closure of NPPs
  - Electronic records
- Some Software challenges noted by France, Korea and Japan were:
  - Ability of the industry to provide nuclear grade components
  - Shortening of outages -> ISI issues
  - Maintenance systems (RCM- CBM)
  - Purchase policy

Challenges being incurred by inspection organisations included:

- Knowledge management issues noted by Canada, Finland and the united States were:
  - Knowledge transfer & retention
  - Training & retraining
  - Ageing
- The Netherlands noted changes in Regulatory framework such as:
  - "All-in-one" (i.e., all inspections related to environment, security, safety, worker's health,… integrated into one inspection bundle)
  - Self regulating industry
- Safety evaluation of NPP's challenges noted by France and the united States included:
  - ROP (Reactor Oversight Process)
  - Safety management systems
- France noted the need for prioritizing corrective actions and Mexico the challenge related to the Effectiveness of inspections.

New / Development of future inspection activities & methodologies

- Belgium, Finland, France and Germany noted the following issues related to the evaluation of organisations:
  - Human factors
  - Evaluation of safety management (measurable? criteria?)
  - Inspection of processes (methodology/Indicators)
- A majority of the countries noted the need to reconsider current inspection activities such as:
  - More coherent approaches
  - Team inspections
  - Promote higher Licensee responsibility (less prescriptive)
  - (Better) use of risk informed inspections
  - Make inspectors more familiar with risk knowledge - (better) use of PSA tools
  - Make broader assessments based on inspections results
  - (Better) use of experience feedback (EF) in inspections activities
  - Use of EF from other countries in inspection

Scope of Inspection Activities

Most countries agreed that the scope of inspection activities will be extended in the future. This was especially true concerning regulations. Along with challenges mentioned previously, Quality Assurance and Self Assessment were added.

New Competencies and Skills

- Improve inspectors skills
  - Human factors (psychological aspects)
  - New technologies
  - Financial aspects
- Mostly mentioned previously
  - Economics, human factor related, new reactor construction & design, PSA tools & techniques, Ageing, Shutdown of plants, etc.

- Challenges
  - Transfer of competence to inspectors
  - Use of team inspector + specialist(s)

Addressing the Future challenges

- Regulations – improvement needed
- Training & retraining inspectors
- Reconsider resources for inspection activities (more resources or re-balanced inspections)
- Integrated inspections – team inspections
- Use of specific tools to support inspections
- More presence on the field – better link with headquarters
- Database on inspection findings
- Use of nuclear data link to monitor plant performance

4. DISCUSSION GROUPS – SUMMARY OF RESULTS

4.1 How Regulatory Inspections Can Promote, or Not Promote, Good Safety Culture

4.1.1 Discussion Groups

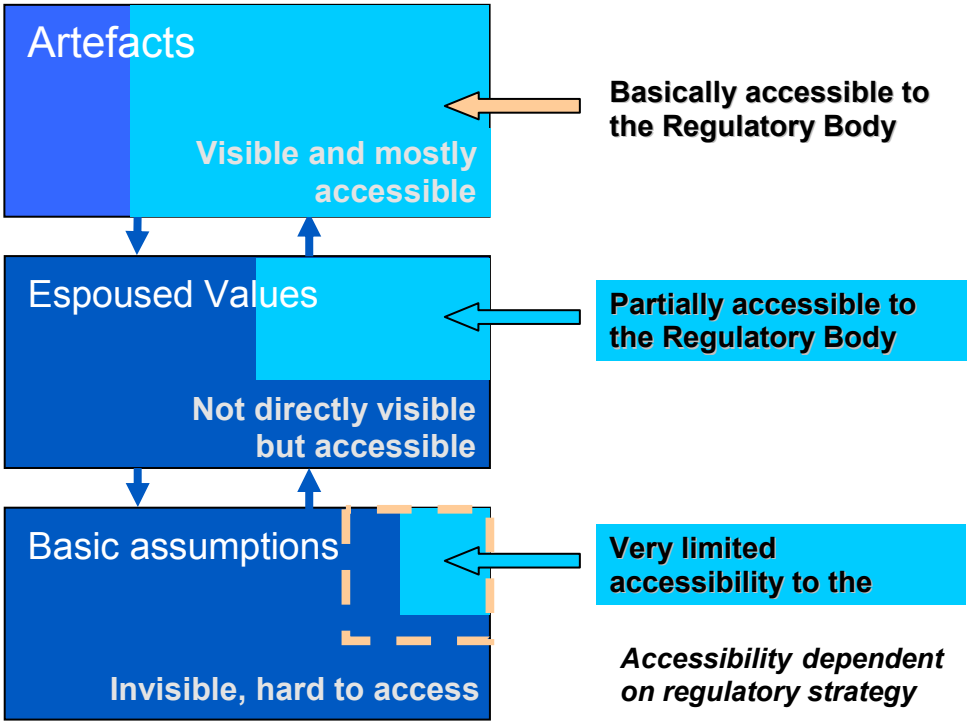
GROUP 1	GROUP 2
Steve Lewis, United Kingdom *	Staffan Forsberg, Sweden *
Luis Gutierrez, Mexico *	Hiroyoshi Koizumi, Japan *
Alice Salway, Canada	Russell Gibbs, United States *
Milka Holopainen, Finland	Michel Gettemans, Belgium
Olivier Veyret, France	Yasunori Roji, Japan
Walter Glöckle, Germany	Kees Jansen, Netherlands
Takeharu Sakaue, Japan	Afansay Kan, Russian Federation
Youn Won Park, Korea	Valery Klopkov, Russian Federation
Lars Axelsson, Sweden	Isabelle Schoenfeld, United States
Cornelia Ryser, Switzerland	
* WGIP Members	

4.1.2 Group Discussions

The results were presented by Mr. Steve Lewis.

4.1.3 Final Results

SCHEIN MODEL



Regulatory oversight of safety culture and safety management.

4.1.3.1 Why does the Regulatory Body care about addressing safety culture in the inspection process?

- Significant events around the world occurred where safety culture was determined to be a root cause of the event.
- Hence, the objective is to enable the Regulatory Body to detect earlier a NPP declining performance related to safety culture prior to it resulting in a significant event.
- Regulatory Bodies can assess licensee performance related to elements of safety culture.
- Regulatory Bodies can encourage licensee self assessment of their performance related to elements of safety culture.
- Thus, Regulatory Bodies demonstrate their belief in the importance of assessing safety culture.

Commendable Practice: How to make Safety Culture "Inspectable"?

1. The Regulatory Body should identify safety culture elements and factor them into their process for inspecting / assessment Safety Culture.

4.1.3.2 Safety Culture Elements / Examples

The Licensees safety management system. Has it got one? Is it appropriate and adequate?

Management

- Knowledge management and succession planning
- Safety management
- Management of organization change

Work practices for:

- Maintenance
- Operation
- Outage
- Modification
- Radiation control

Internal communication/involvement

Interaction with outside world

Improvement programme

Documentation and Records

Digital documents are of some concerns.

Operating experience

Improvement programme

Regulatory relation

External interaction

Internal Involvement

Attitude

Organizational and individual behaviour

Self Assessment

Training and competence

Resource and funding

Work control

Reporting culture

Commendable Practices: Possible Approaches

2. The Regulatory Body may group elements of safety culture into key areas such as human performance, problem identification & resolution, concern raising environment, organizational support, etc.

   or

   The Regulatory Body may identify certain important elements to focus on which themselves may encompass other elements.

3. **IMPORTANT PRACTICE -** Safety significance should be factored into assessing licensee safety culture.

Commendable Practices: Approaches

4. Regulatory Bodies could explicitly address elements of safety culture during routine inspections.

5. Regulatory Bodies could assess elements of licensee safety culture on a periodic basis independent of performance, to reveal "hidden" issues.

6. Regulatory Bodies could conduct targeted inspection in reaction to an event, incident or degraded condition.

Commendable Practices: Competence

7. Human factor and organisational specialists should be involved:

   - in the design of inspection oversight programmes in order to capture elements of safety culture.

   - in some elements of its implementation to understand the inspection process and contribute to its delivery.

8. Inspectors should have an understanding of safety culture to be able to carry out effective inspections.

9. In some countries inspectors make judgements regarding safety culture while in other countries "human factors specialists" are involved.

10. Inspector training should specially include what safety culture is and how their interaction with licensees can affect safety culture.

Commendable Practices: Safety Culture Assessment

11. The assessment process should consider findings arising from the inspection of the individual safety culture elements.

12. An individual inspector should not be required to assess licensee safety culture independently. However, inspector findings that impact on should be factored into the assessment of licensee safety culture.

4.1.3.3 Inspector Impact on Safety Culture

Inspectors should consider that unintended consequences may occur from their interactions with licensees. This can be both positive and negative.

Commendable Practices: Inspector Impact

13. Inspectors need to manage their inspections and behaviour to take this in to account. Examples of this are:

    - Management of Inspections and requirements etc. is needed to minimize distraction of Licensees safety role.

    - Inspector concentration on particular things to be done can distort the Licensees' prioritization process depending on the LS understanding.

    - Inspectors should remain in the role of inspectors and not lead the Licensees, especially in the area of their technical expertise, to ensure that the responsibilities for safety remain with the Licensee.

14. Regulatory Bodies should be reviewing their own inspection practices and behaviours to determine their impact on the Licensees safety culture.

4.2 Inspection of Interaction between the Licensee and its Contractors

4.2.1 Discussion Groups

GROUP 1	GROUP 2
Ynte Stockmann, Netherlands *	Julio Crespo, Spain *
Benoit Zerger, France *	Brant McNeish, Canada *
Mats Häggblom, Sweden *	Gyula Fichtinger, Hungary *
William De Boer, Canada	Petri Vuorio, Finland
Hansjörg Emrich, Germany	Frank Schlögl, Germany
Jong Tae Ha, Korea	Fukio Mori, Japan
William Thompson, United Kingdom	
* WGIP Members	

4.2.2 Group Discussions

The discussions in both groups started out by defining the topics of relevance and interest relating to contractors of goods and services.

4.2.3 Final Results

4.2.3.1 Introduction

The Licensee must be held responsible for the work of all contractors and the Regulatory Body needs access to the site of the contractors.

We began by defining who was a contractor, a previous definition used in an earlier WGIP document defined a contractor as, “An independent company performing a design, maintenance, operation, test, installation or modification at the nuclear plant, on behalf of the licensee, by contract, or service for the licensee”. This was broadened to include; an individual, group of people, or a company, who is engaged by means of a contract or other legal service agreement with the responsible owner or licensee, to performs any service for the nuclear facility.

Group 1 began by considering the issue from more of a theoretical point, with the addition of practical experience. Group 2 approached the issue considering recent experience with issues at nuclear power plants that related to contractors. These, different approaches gave complimentary results, which were merged into six shared commendable practices.

There was a general concern by both groups that when contractors are used, there are extra risks to be considered. Licensees of nuclear power plants are shortening outage times and trying to reduce costs at the same time. This leads to contractors working faster and possibly for less money. At the same time, it has been noticed that there is an increased number of contractors, some with less experience then noted in the past. Also, some contractors are working at more than one outage simultaneously, with the same people working long hours running between sites.

Both groups considered it important to note that the licensee or owner is responsible for safety. Not only of the work they have done themselves, but also to the work done by contractors. This led to a lot of discussion on the principle of the rights and duties of the Regulatory Body. This discussion was held not only within the two groups, but also in the closing session where an agreement on two points was conclude:

- The Licensee must be held responsible for the work of all contractors.
- The Regulatory Body needs access to the site where contracted work is being done.

Reflected in Commendable Practice 1 is the idea that considering all the possible points of inspection of the contracting process, it is impossible to carry out all those possible inspections. The Regulatory Body should have the powers and capabilities to inspect when deemed necessary.

In Commendable Practice 2, the licensees/owners have to maintain their competence in order to fulfil their responsibilities for safety. The discussion group members did not wish to define a name for this competence, but the term “Intelligent Customer” and “Smart Buyer” were used.

In Commendable Practice 3, an important part of any contracting process is quality management (QM). How the licensees/owners conduct their QM has to be inspected. However, inspections should involve more than reviewing records and quality documents.

Commendable Practice 4 highlights that in many countries the Regulatory Body needs to write inspection guidelines before it can inspect. The groups noted that guidelines for inspecting the competence of contracts, or even the contracting process itself, are rare and are yet it be written. Even if these guidelines are not legally required, they contribute to an effective inspection.

Commendable Practice 5 deals with operating experience. During the discussions it was recognized that there was possible a lot of experience involving contracted work, but that trending was not been systematically carried out on contractors. Reliable quantifiable data would be a great asset to be able to justify regulatory attention on contractors, contracted work or the QM process governing the contracting work. In the discussions it was recognized that it is very difficult to create a reliable data on contract related issues, and the Regulatory Body should not rely solely on quantified data. Nevertheless commendable practice 5 states that operating experience should be used.

An issue that emerged during the discussions is the different powers that Regulatory Bodies have and/or use over national or foreign contractors. It is often assumed by Regulatory Bodies that foreign companies have either less or more knowledge and need different regulatory scrutiny. Commendable Practice 6 reflects the principal that all contractors should be inspected in the same manner, no matter if they are national, foreign, big or small.

The closing discussion confirmed that not all Regulatory Body will be able to implement all of these commendable practices immediately. Some where concerned with the risk of taking over the responsibilities of the licensees. One controversial aspect was the suggestion to inspect the licensees/owners Bid Assessment process, but because of experiences shared in the discussion groups, it was felt that this option should be left open.

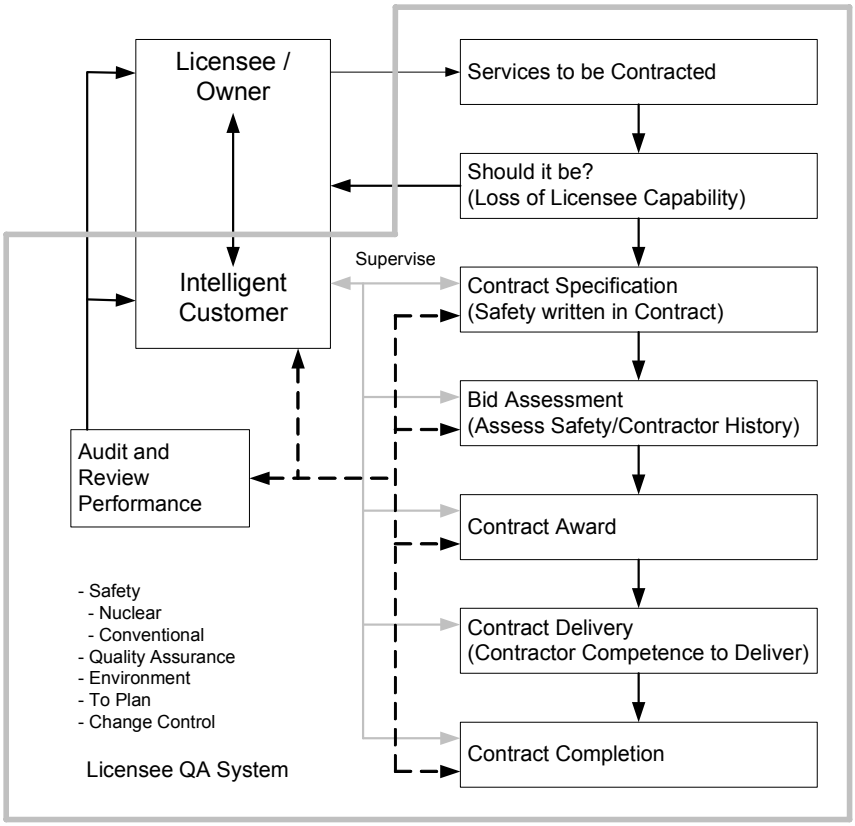
4.2.3.2 Observations of the Groups

- There is extra risk when using contractors.
- Many licensees are not treating large and small contractors the same when it comes to their oversight position. Similarly, some licensees do not treat domestic and foreign contractors the same.
- Licensees of nuclear power plants are shortening outage time and trying to reduce costs at the same time. This leads to contractors working faster and possibly for less money. At the same time an increased number of contractors, some with less experience, has been noticed. Some contractors are working at more than one outage simultaneously, with the same people working long hours running between sites.

4.2.3.3 Definition of Contractor

An individual, group of people or company, who performs any service for the nuclear facility, engaged by means of a contract or other legal service arrangement with its responsible owner or licensee.

4.2.3.4 Contracting Process



4.2.3.5 Services that are Contracted (Examples)

Construction	Project Management	Manufacturing	Radiation Protection
Commissioning	Operation	Maintenance	Security
Training	Dosimetry	Examination	Waste Management
Cleaning	Safety Assessment	Engineering	In-Service Inspections
Design (including turn key design)	Fuel Supply	Fuel post irradiation	

Commendable Practices

1. The Regulatory Body inspects all aspects of the contracting process:
    - contract placement
    - bid assessment

- contractor requirements
- contract delivery
- contract completion
- the audit & review and feed-back process

On the basis of safety relevance, risk assessment and engineering judgement, with links down to all sub-contractors.

2. The Regulatory Body inspects the policy of the licensee to keep its ability to:
   - carry out its contract management tasks,
   - judge competency of contractors,
   - understand its responsibilities under the law, and
   - understand the safety features and hazards of its plant and how any contract may affect these.
3. The Regulatory Body inspects in the field rather than only reviewing records and uses multi-disciplinary teams when appropriate.
4. The Regulatory Body has sufficient guidelines to describe the inspection of contracting.
5. The Regulatory Body directs its inspection on licensee's contracting activities, based on records and trending.
6. The Regulatory Body treats large or small, foreign or domestic contractors equally. Regulatory bodies co-operate concerning work with foreign contractors, but are aware of different standards.

4.2.3.6 Appendices

Examples of aspects of contracting process which may be inspected:

a) contract placement, bid assessment and contractor requirements

- The QA program of contractor must be fit for purpose
- Competence of the licensee's people bid assessment
- Priority of safety in purchase policy and budgeting
- Safety Plan
- Performance history of the contractor
- Requirements for completion and contract delivery.

b) contract delivery, on site, off site and on or off site

Contract Delivery (on and offsite)	
Change control Training of the workers for the job and the safety on the working site Supervision plan (licensee and contractor) Review arrangements Safety plan Risk awareness Procedures and work instructions	Plant hand over arrangements Responsibilities clearly specified Feedback and the liaison arrangements Hold points Security Change approval Spare parts Risk monitoring Equipment

On Site	Off Site
• Work conditions • Emergency arrangements • Radiation protection • Interfaces with environment	• Contractor follows their own management system

Completion

- Changes to the original plan
- Configuration control
- Completion of documentation
- Fulfilling of the specification
- Lessons learned
- Commissioning
- Security
- Experience feedback from contractor

c) the audit & review and feed-back process

- Formal Procedures
- Nuclear and conventional safety
- Environment
- Security
- Change control
- Procedure assessment
- Time plan
- Capacities and responsibilities
- Feedback system to management and to workers
- Corrective actions system

4.3 Future Challenges for Inspectors (e.g., New Techniques, Developing Competence, etc.)

4.3.1 Discussion Groups

GROUP 1	GROUP 2
André Vandewalle, Belgium *	Radomir Rehacek, Czech Republic *
Rick Aubrey, Canada	Laurent Foucher, France *
Kyun-Tae Kim, Korea *	Daniel Billeter, Switzerland *
Aloysius Lin, Canada	Lingquang, Guo IAEA *
Kenneth Lunm Canada	Louis-Arthur Langlois, Canada
Walter Bergbauer, Germany	John Van Berlo, Canada
Rafael Silva Mendilibar, Spain	Hirozo Shiomi, Japan
* WGIP Members	

4.3.2 Group Discussions

Two groups were discussing this item. In order to start with the discussions, three questions were asked to both groups:

- Based on this morning's presentation, is there any central theme or message that emerges? *This presentation was the summary of the answers provided by the different countries on the survey (see questions in appendix).*
- Can you suggest any possible ways to address these challenges?
- Prioritization? *Among the future challenges identified, some prioritization would be desirable.*

Based on these questions, the two groups started in some different ways. Group defined 8 areas of future challenges to be covered as following:

1. Inspections & information management
2. Human resource management
3. Increasing commercial pressure
4. Organisational change
5. New technologies
6. Regulatory Body quality management

7. New legislation[2]

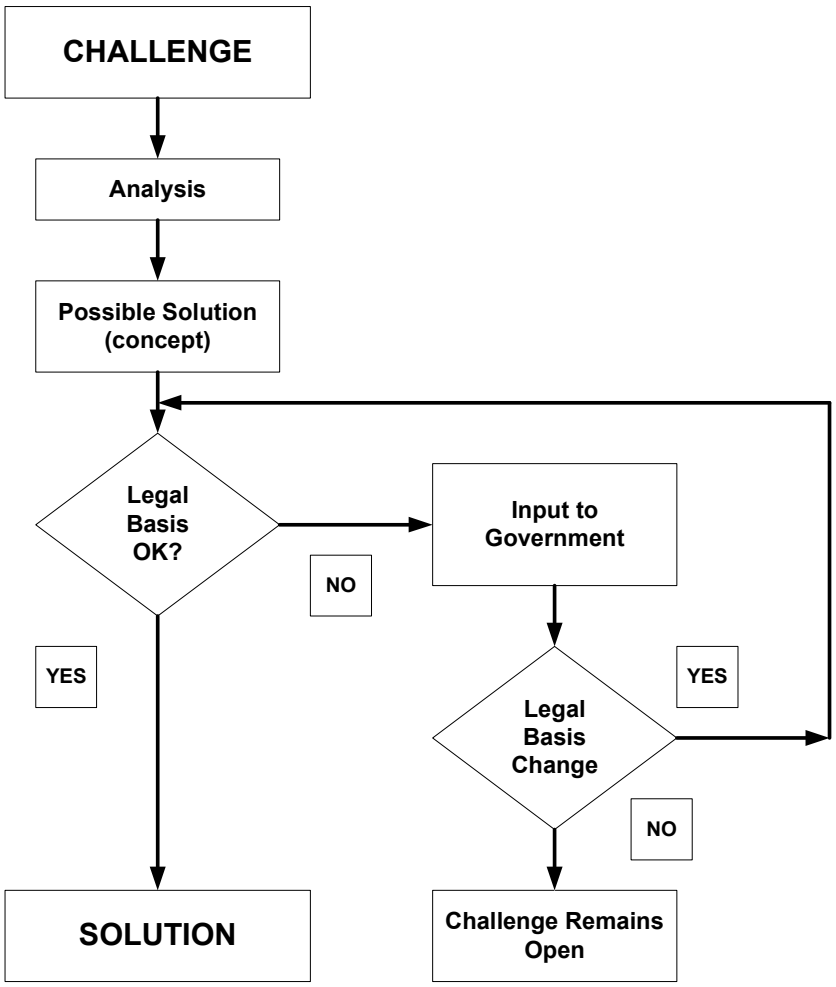
8. Reactor decommissioning[1]

Group 2 decided to develop further discussion on future challenges based on the "3-P's": People, Process & Products.

Although differences in approach between the two groups, many ideas were similar and it was possible to combine their thoughts into one single presentation, using the structure proposed by group 1.

The results were presented by Mr. André Vandewalle.

4.3.3 Results



[2] These last items were not developed due to lack of time.

4.3.3.2 Inspection Processes and Information Management

The improvement of the inspection processes was considered as a future challenge. In particular, better harmonisation and coherence of inspections activities between inspectors was deemed necessary. Several members underscored that the communication between the inspectors was often unsatisfactorily. The inspections activities have more and more to cope with human factor related aspects and inspectors are generally not educated to face these issues.

The following ways to address these challenges were proposed:

- Creation of a **central database of all inspection findings** that is accessible to all Regulatory Body staff, including specialists, useable for performance evaluations (e.g. Quarterly or annual reports) or for tracking following up and trending

- Ensuring that inspectors, who typically have technical backgrounds, receive **human factors training** that allows them to inspect for and identify HF issues such as organization, attitudes, behaviour, man/machine interfaces, etc

- Maintaining a well-defined and structured **inspection programme** – minimum inspections to be done, up-to-date inspection guides - amidst organisational change, modification, improvements, etc (i.e.. Change management)

  - Develop/design inspection program which blends "deterministic", "base-line" inspections and additional inspections based on risk (PSA) and condition based

  - Use safety significance to set frequency

  - Inspections of all stages of plan life (design, Construction. Commissioning, operation, outage decommission)

- To attain a **consistent and coherent approach**, the use of team inspections, clear requirements and guidelines, inspector/specialists discussion, routine discussion of findings, inspector training including use of case studies

  - Harmonize/align national and regional inspectional programs

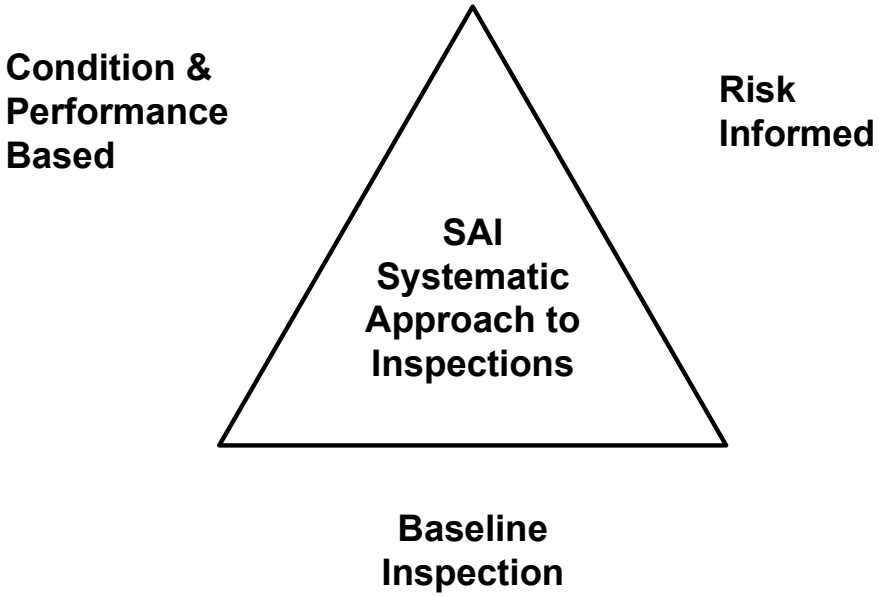
- The ability to **determine risk (safety significance)** consistently remains a challenge for which there is a need for tools to assist the inspector

  - Inspections related to barriers / defence in depth

  - Overlay PSA on inspections (frequency, depth, response)

  - Condition based inspections specific to reactor, events at reactor, planned inspection

  - Develop common international standard approach to evaluation rating



4.3.3.3 Human Resource Management

The management of human resources represents a future challenge for regulatory inspections organisations for several reasons such as: reduction of governmental budgets, ageing and retirement of inspection personnel, etc. When hiring new inspectors, coming directly from the university, it may be necessary to educate them in old technology which are still in use in the reactors, but not more taught at school. Following ways to address these challenges were proposed:

- Where there is possible **loss of knowledge**, such as through retirements, the use of succession planning (written procedure), mentoring, and a databank of important information such as regulatory decisions are solutions to consider.

- Contract with **retired inspectors**, training of newcomers (technical, methodology), mentoring of newcomers.

- Time for inspectors before retirement to do the knowledge transfer (overlap).

- Development and delivery of a **systematic training programme** (that covers old technology); new inspectors to receive accelerated training early particularly in light of an ageing workforce.

- Salaries competitive with licensees salaries (alternative ways to fund regulatory body if required).

- Career planning

  – alternatives

  – interesting intellectually challenging tasks

  – opportunities for higher position

  – senior inspectors/ inspectors.

- To address Regulatory Body resource reductions:
  - Make use of licensees inspections and additional information provided before inspection by Regulatory Body
  - Develop an Regulatory Body set of performance indicators to verify licensee processes
  - Rely more on other tools – PIs and event trending
  - Focus more on risk
  - Alter frequency based on inspection results.

In summary: Timely recruiting and systematic training of new inspectors. Creating intellectually challenging jobs. Retain and document inspection knowledge and experience.

4.3.3.4 Increasing Commercial Pressure

Due to increase competition, resulting mainly from the opening of the electricity market, the inspection activities have to cope with increased commercial pressure in the activities of the Licensees. In order to face these issues, following ways to address them were proposed:

- Do **surveillance and monitoring**, with the aid of performance indicators, to ensure that licensee resource reduction has not degraded plant safety.
- To address difficulties caused **by reduced outage length** (inability to complete necessary inspections), obtain help from other Regulatory Body staff such as specialists and other inspectors. Use of **risk information** to consider establishing a minimum outage length considered as acceptable by the Regulatory Body.
- Use **technical support organization** (TSO) to augment inspection team or organization.
- Use of past inspection results.

4.3.3.5 Organisational Changes & External Factors

Changes by the Licensees can result in significant organizational changes and some reactions in matter of inspections activities are needed:

- To address situations involving company split-up or work contracted out, **expand inspection programmes** to cover link between licensee and sub-company/contractor to ensure license requirements are met for provided service (see contractor group).

It is sometimes possible to anticipate by performing:

- Early "Task analysis".
- Early adoption of legal basis.

4.3.3.6 New Technologies

The use of new technologies by the Licensee can be due to following causes: necessity to replace obsolete equipment, construction of new reactors, refurbishment of old reactors, etc. Ways to address these challenges may include:

- Training and help from other countries (new reactors).
- Special training from component providers or from licensees for components using new technology.
- Develop inspections focused on ageing and refurbishment.

4.3.3.7 Regulatory Body Quality Management

The Regulatory Bodies will have in the future more and more to demonstrate to the public and to their government that they provide for quality in their inspections activities. Ways to address this issue are listed hereafter:

- Certification.
- Conduct an IRRS.
- Develop and implement a self-assessment process for the inspection activities.
- Develop a set of internal performance indicators, focused on results.

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

Dr. Klonk 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, Dr. Klonk thanked the Canadian Nuclear Safety Commission (CNSC) staff in particular the efforts of a few individuals who made major contributions. François Rinfret and Brant McNeish who co-ordinated all the organisation efforts as well as the technical contents of the workshop with the CNSC staff, especially Fran Edwards, Gail Clark and Cheryl Lessard who helped put together all the various aspects of the programme and ensured the success by their diligence to all the many details involved. Dr. Klonk 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, Dr. Klonk 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 Practices

6.2.1 How Regulatory Inspections Can Promote, or Not Promote, Good Safety Culture

A. How to Make Safety Culture "Inspectable"

1. The Regulatory Body should identify safety culture elements and factor them into their process for inspecting / assessment Safety Culture.

B. Possible Approaches

1. The Regulatory Body may group elements of safety culture into key areas such as human performance, problem identification & resolution, concern raising environment, organizational support, etc.

or

2. The Regulatory Body may identify certain important elements to focus on which themselves may encompass other elements

IMPORTANT PRACTICE - Safety significance should be factored into assessing licensee safety culture.

C. Approaches

1. Regulatory Bodies could explicitly address elements of safety culture during routine inspections.

2. Regulatory Bodies could assess licensee Safety Culture on a periodic basis independent of performance, to reveal "hidden" issues.

3. Regulatory bodies could conduct targeted inspection in reaction to an event, incident or degraded condition.

D. Competence

1. Human factor and organisational specialists should be involved:

   – in the design of inspection oversight programmes in order to capture elements of Safety Culture

   – in some elements of its implementation to understand the inspection process and contribute to its delivery.

2. Inspectors should have an understanding of Safety Culture to be able to carry out effective inspections.

3. In some countries inspectors make judgements regarding Safety Culture while in other countries "human factors specialists" are involved.

4. Inspector training should specially include what Safety Culture is and how their interaction with licensees can affect Safety Culture.

E. Safety Culture Assessment

1. The assessment process should consider findings arising from the inspection of the individual Safety Culture elements.

2. An individual inspector should not be required to assess licensee safety culture independently. However, inspector findings that impact on Safety Culture should be factored into the assessment of licensee Safety Culture.

F. Inspector Impact

1. Inspectors need to manage their inspections and behaviour to take this in to account. Examples of this are:

   – Management of Inspections and requirements etc. is needed to minimize distraction of Licensees safety role.

   – Inspector concentration on particular things to be done can distort the Licensees' prioritization process depending on the LS understanding.

   – Inspectors should remain in the role of inspectors and not lead the Licensees, especially in the area of their technical expertise, to ensure that the responsibilities for safety remain with the Licensee.

2. Regulatory Bodies should be reviewing their own inspection practices and behaviours to determine their impact on the Licensees Safety Culture.

3. Regulatory Bodies should be reviewing their own inspection practices and behaviours to determine their impact on the Licensees Safety Culture.

6.2.2 Inspection of Interaction between the Licensee and its Contractors

A. The Regulatory Body inspects all aspects of the contracting process:

- contract placement
- bid assessment
- contractor requirements
- contract delivery
- contract completion
- the audit & review and feed-back process

on the basis of safety relevance, risk assessment and engineering judgement, with links down to all sub-contractors.

B. The Regulatory Body inspects the policy of the licensee to keep its ability to:

- carry out its contract management tasks,
- judge competency of contractors,
- understand its responsibilities under the law, and
- understand the safety features and hazards of its plant and how any contract may affect these.

C. The Regulatory Body inspects in the field rather than only reviewing records and uses multi-disciplinary teams when appropriate.

D. The Regulatory Body has sufficient guidelines to describe the inspection of contracting.

E. The Regulatory Body directs its inspection on licensee's contracting activities, based on records and trending.

F. The Regulatory Body treats large or small, foreign or domestic contractors equally. Regulatory bodies co-operate concerning work with foreign contractors, but are aware of different standards.

6.2.3 Future Challenges for Inspectors (e.g., New Techniques, Developing Competence, etc.)

Based on topic, the development of commendable practices was not the objective of this group, rather the following ways to address these challenges were proposed:

A. Creation of a **central database of all inspection findings** that is accessible to all Regulatory Body staff, including specialists, useable for performance evaluations (e.g. Quarterly or annual reports) or for tracking following up and trending.

B. Ensuring that inspectors, who typically have technical backgrounds, receive **human factors training** that allows them to inspect for and identify HF issues such as organization, attitudes, behaviour, man/machine interfaces, etc.

C. Maintaining a well-defined and structured **inspection programme** – minimum inspections to be done, up-to-date inspection guides - amidst organisational change, modification, improvements, etc. (i.e.. Change management):

   - Develop/ design inspection program which blends “deterministic”, “base-line” inspections and additional inspections based on risk (PSA) and condition based
   - Use safety significance to set frequency
   - Inspections of all stages of plan life (design, Construction. Commissioning, operation, outage decommission).

D. To attain a **consistent and coherent approach**, the use of team inspections, clear requirements and guidelines, inspector/specialists discussion, routine discussion of findings, inspector training including use of case studies:

   - Harmonize/align national and regional inspectional programs.

E. The ability to **determine risk (safety significance)** consistently remains a challenge for which there is a need for tools to assist the inspector:

   - Inspections related to barriers / defence in depth
   - Overlay PSA on inspections (frequency, depth, response)
   - Condition based inspections specific to reactor, events at reactor, planned inspection
   - Develop common international std. approach to evaluation rating.

7. EVALUATION

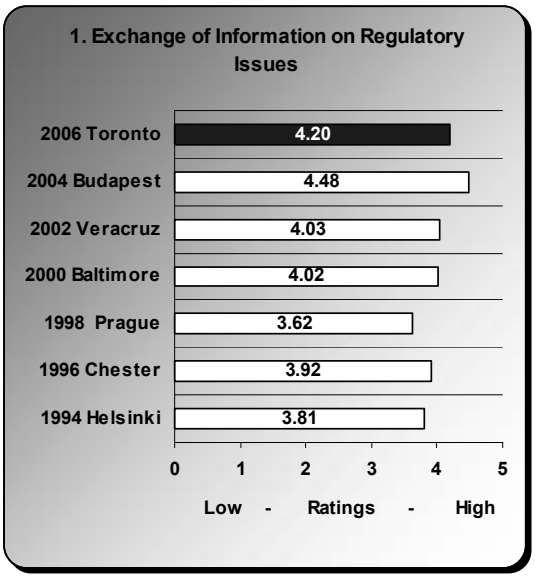
7.1 Evaluation Form

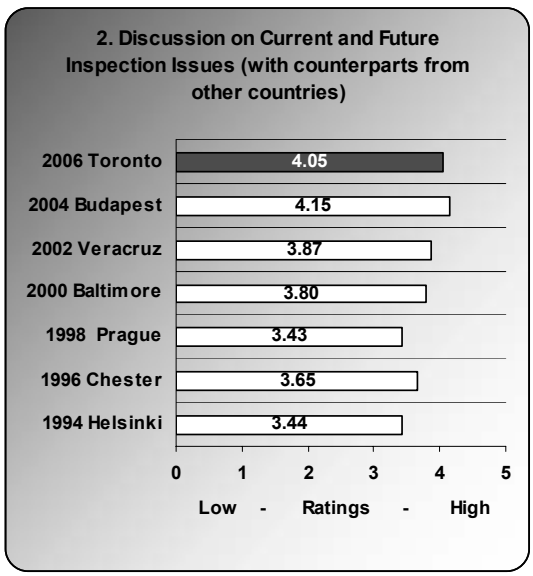
All participants at the workshop were requested to complete an evaluation form. The results of this questionnaire summarised below, are utilised by WGIP in setting up future workshops and to look at key issues for in the programme of work over the next few years. Of the 55 total participants 29 responses were received.

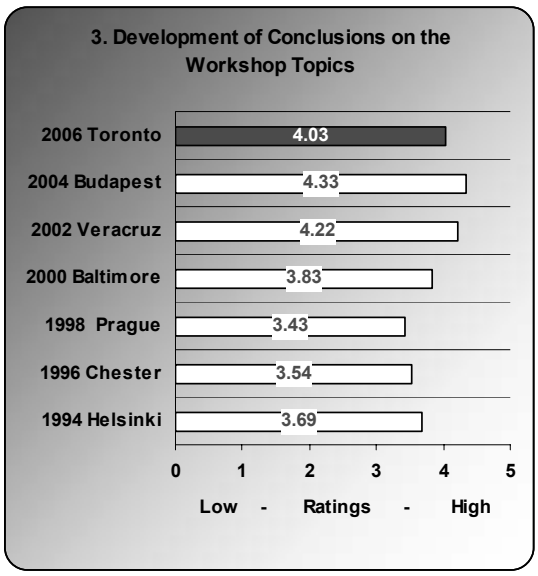
The evaluation form, which was similar to ones issued at previous workshops, asked questions in 4 areas: general - workshop objectives, workshop format, workshop topics and future workshops. An additional question was added to determine to what extent the information gained from the workshop is used within the Member countries. 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.

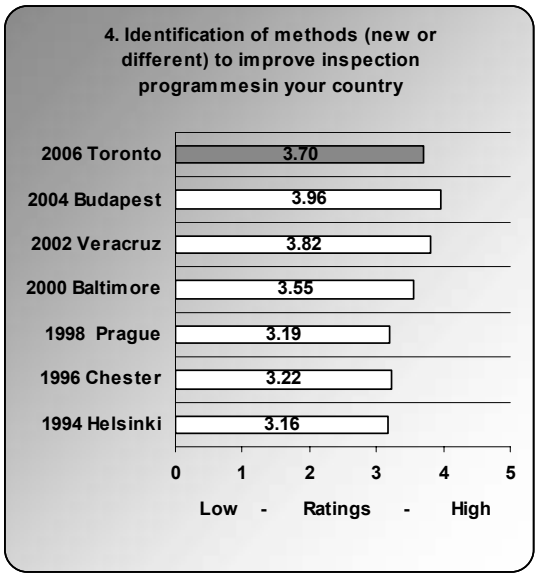
7.2 General

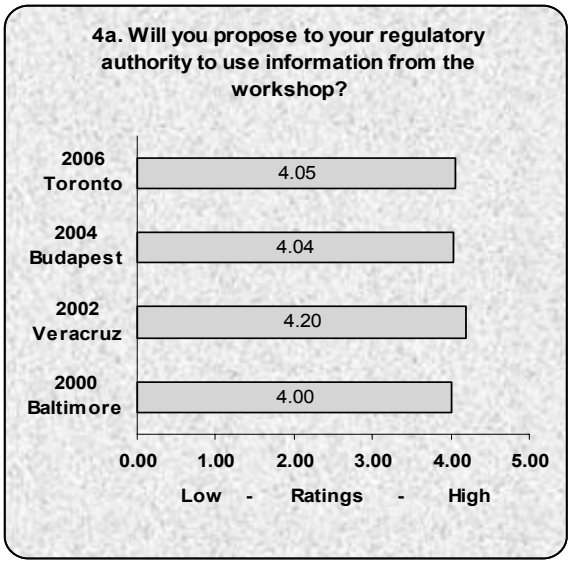
Each of the following charts depicts a specific objective of the workshop and the participants responses on how well they were met.

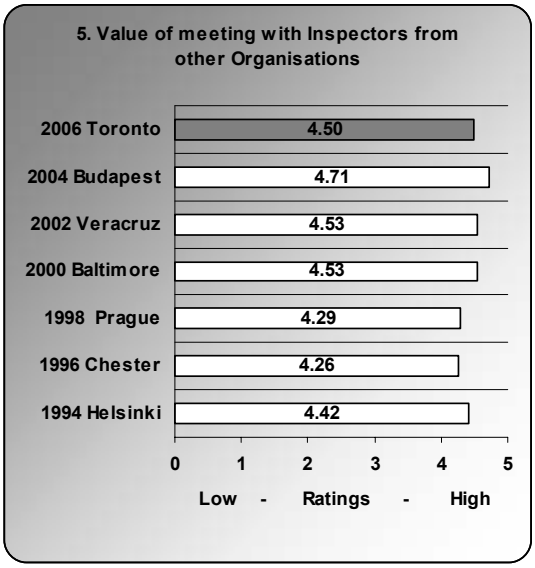










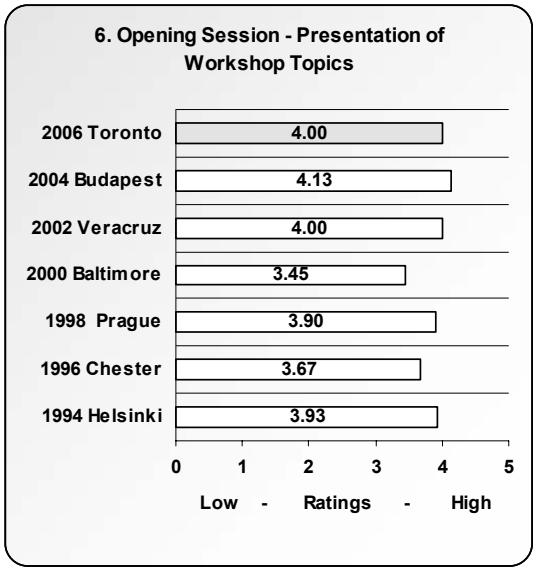


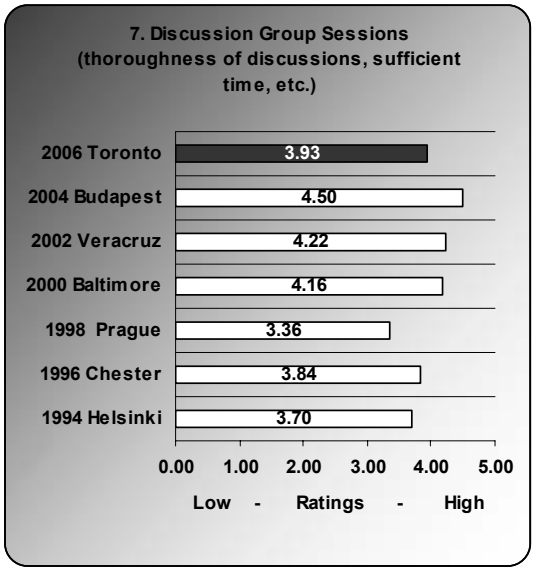
The results, while slightly lower than in the last evaluation (from the 7th Workshop) clearly show how participants continue to see the value in these workshops. The responses to questions 1, 2, 4, 4a and 5 show that not only do participants find the exchange of information valuable, but were able to identify issues and methods to use in improving their own inspection programmes.

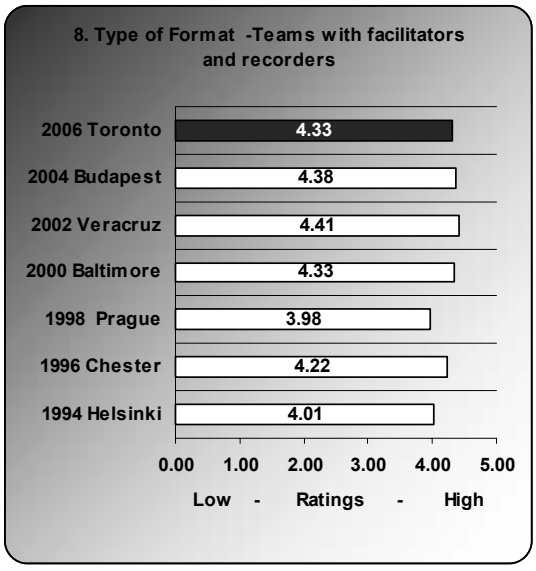
WGIP members in preparing future workshops will need to carefully assess these results and incorporate changes or improvements in order to ensure that these objectives are met.

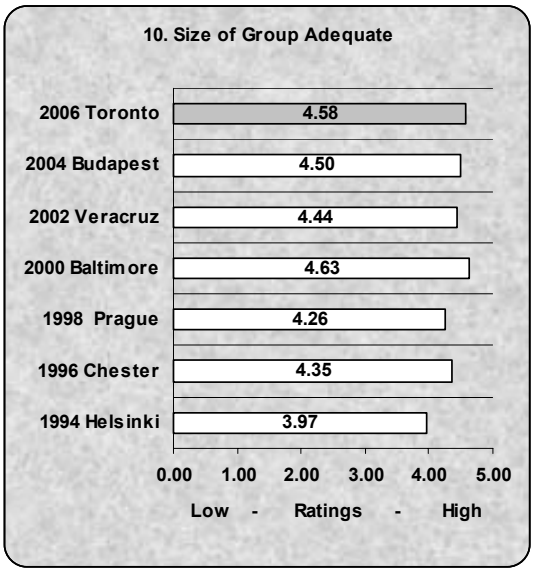
7.3 Workshop Format

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.







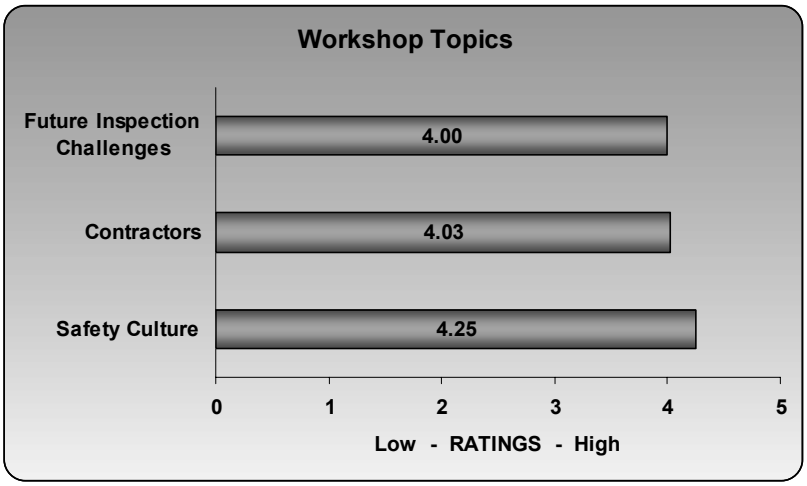


The results from this section in general, improved from the last workshop. The workshop format is the same that has been over the past 10 years or more and the marks indicate that WGIP members have become more efficient in preparing and running the workshop. The success of each workshop is dependent 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.

The interest of the participants in the topic, especially concerning identifying new or different inspection methods is also a key element. Additionally, the results show that the size of groups (small in numbers) helps provide for better discussions and increased participation by the individuals participants.

7.4 Workshop Topics

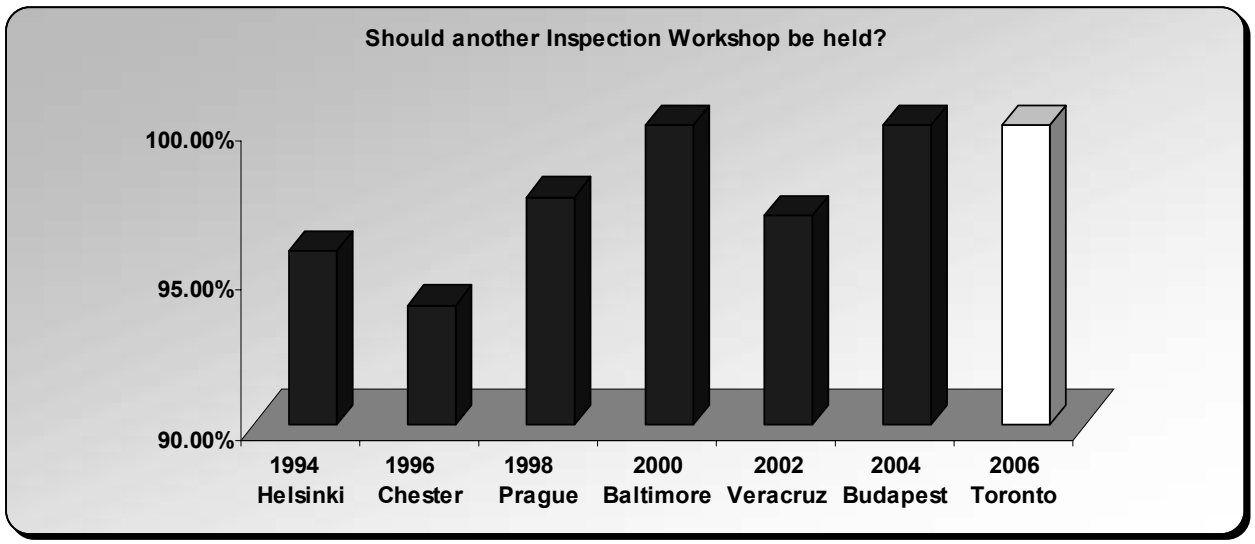
In order to assess how well the topics have been addressed, participants are asked to give a rating on whether they perceived the topics were covered adequately.

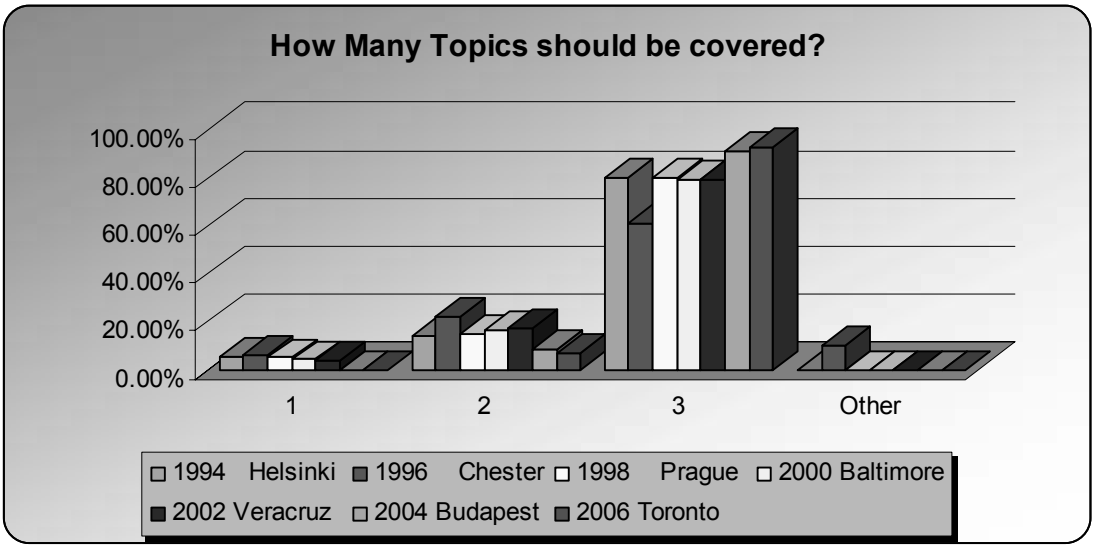


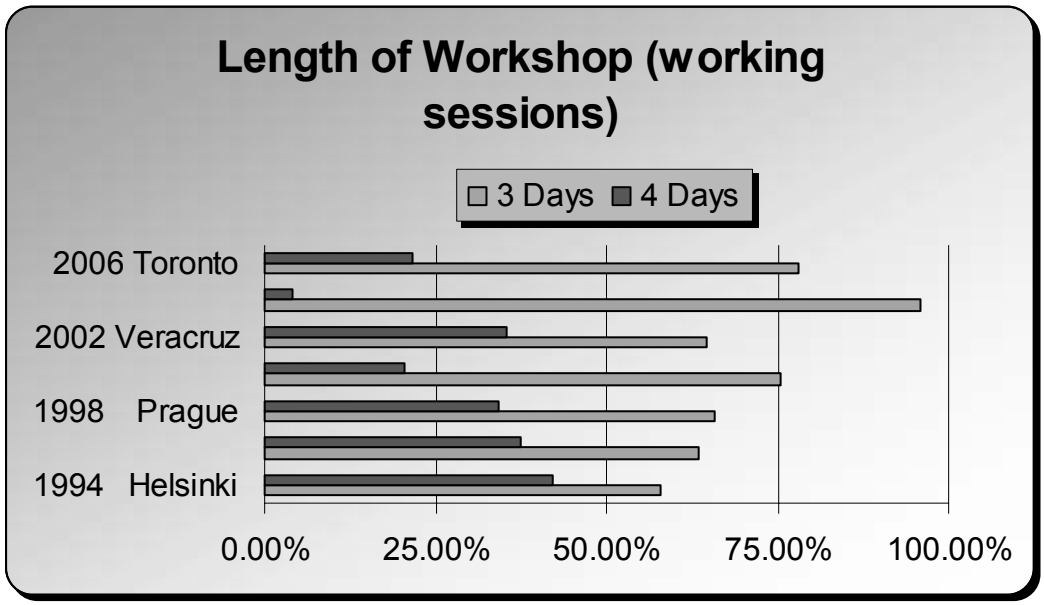
Workshop participants were generally satisfied with the selection of topics and how they were addressed. The scores recorded were similar to past workshops and the importance of inspection of safety culture is clearly depicted.

7.5 Future Workshops

While section 6.3 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:

- How do Inspectors add value to regulatory-decision making process (risk-informed)?
- How to share inspectors' experience [Ex. How to detect the degradation, What are the inspection items (know-how, actual and specific examples, etc.)]?
- Inspection of digital I&C Systems.
- Training and Qualification of Inspectors.
- Inspection of safety culture, licensee management systems, etc. / Integration of safety culture assessment with safety management systems inspection.
- Benchmarking/equalisation of inspection.
- Inspections and operating experience / Integration of findings with PI information, event reviews.
- Communication of inspector results to the public.
- Continue work with contractors; the need for the concept of intelligent customer and the characteristics of this.

- Inspection on Ageing plant(s).

- Fire Protection – How do improve inspections to help determine risk of findings.

Part of the next workshop should be devoted to a 2-year follow-up on commendable practices from this workshop *e.g., survey the countries on the status of commendable practices in their country before the workshop and discuss the results at the workshop.

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