FNCA NUCLEAR SAFETY CULTURE PROJECT

SUMMARY OF THE 2003 WORKSHOP

9-13 FEBRUARY 2004 IN DAEJEON, KOREA (ROK)

The workshop was opened by a warm welcome from Mr Jong-Bae CHOI, Director of Atomic Energy International Cooperation Division of the Ministry of Science and Technology (MOST).

Mrs Cait Maloney, Director Safety and Radiation Science ANSTO replied, welcomed distinguished guests and delegates on behalf of ANSTO and reiterated the aims of the project.

Dr In-Soon CHANG, President of KAERI gave the opening address and welcomed the delegates to KAERI.

Mr Bastin, Australian FNCA Project Leader for Nuclear Safety Culture, ANSTO replied and thanked the Korean hosts for their preparation and highlighted some of the main achievements of the project to date.

Opening remarks and overview of the Nuclear Safety Culture project by Prof Ishikawa (Japan)

Prof Ishikawa (Japan) noted several key events that occurred and issues that arose over the last year including:

- The issues arising out of the TEPCO cover-up of inspection data which revealed cracking in some of their BWR Core Shrouds and the concomitant changes in the Japanese regulatory structure; and
- US deregulation of the nuclear industry and the issues arising in greater competitive pressures and cost cutting;

These issues emphasised the continuing importance of effective promotion in Safety Culture.

Professor Ishikawa also noted the Nuclear Safety Culture Training Workshop funded by the IAEA/Extra Budgetary Program that was held in Korea in November 2003.

The IAEA/EBP Nuclear Safety Culture Training Workshop in Korea in November 2003

Mr Situmorang (Indonesia) presented a summary of the IAEA/EBP Nuclear Safety Culture Training Workshop in Korea in November 2003. Highlights of areas covered were

- Schein and Hofstede models of culture;
- The socio-drama role play and the insights this gives to both regulator and operator;
- The seven “S”s of Safety Culture (Staff, Skills, Style, Supervision, Shared Values, Structure and Safety Strategy);
- Barrier models of incident propagation and the part that safety culture plays in the prevention of incidents and accidents;
- Symptoms of decline of safety culture;
- The six regulatory strategies and how and when these might be applied by a regulator; and
- The outcome statement.

Personal outcomes for Mr Situmorang were the common understanding, developing and applying safety culture indicators, and the need for eternal vigilance against complacency.

It was noted that the IAEA has recognised the achievements of the FNCA Nuclear Safety Culture Project and had included the need for an ongoing collaboration with FNCA on this issue. This is apparent in the outcome statement from that training workshop. The meeting noted the involvement

of other international agencies (such as IAEA, EBP, RCA and to a lesser extent NEA) in the promotion of safety culture in non-power nuclear installations in the region. The meeting agreed to recommend to the FNCA Coordinators that they pursue closer collaboration with these agencies to work collaboratively to avoid duplication.

Prof Sinh, who also attended the Training Workshop added that the meeting was well organised and the socio drama was an effective tool for helping to understand the roles and positions of the various stakeholders in the nuclear industry.

Country Reports

The Country reports include reports on the six indicators of activity in Safety Culture, the eleven (11) benchmarks, and the responses to the Nuclear Safety Convention Articles 7-10, 14 and 16 as if they had been signatories in respect of research reactors. The reports were presented as updates on previous reports.

China did not report exactly against the various indicators, benchmarks and articles but provided information on Research Reactor safety management and Safety Culture promotion activities in China.

Building on the achievements reported at the previous workshop, further progress is being made in the achievement of greater independence of regulatory activities in Malaysia, Thailand, and the Philippines. In Malaysia, the AELB now has regulatory control over government agencies including MINT facilities. In Thailand, there is growing effective separation of the regulatory activities and it is awaiting passage of a decree to finalise the separation of OAP which will be the regulatory body from TINT, the Thai Institute of Nuclear Technology. In the Philippines, the division of PNRI established to exercise the regulatory role carried out by PNRI will in the mid term be managed by a deputy director responsible only for the regulatory function, and in the long term, awaiting enactment of appropriate laws to create an independent regulatory body with coverage of all PNRI facilities in addition to sources and apparatus throughout the country.

Viet Nam reported that its revised SAR for its DNRR has been submitted to the regulatory body and they are awaiting renewal of their operating licence.

Resources were still an issue in some countries especially in one where, due to staff “ceilings”, the reactor was sometimes operated by researchers.

In Indonesia, the local arrangements governing safety are still typically quite dissimilar in the different sites. It was aimed to establish some general arrangements with which the local arrangements would be expected to comply. This is hoped to be progressed in the next twelve months.

Thailand reported that it has invited IAEA/EBP Integrated Safety Evaluation (ISE) which examines nuclear safety from a holistic perspective.

Further attitudinal surveys have been conducted in Thailand and Australia. The Thai surveys will continue in 2004. In ANSTO, an issue for consideration is the correlation of between survey results and safety performance. Further surveys are planned in ANSTO for 2004/05 and new partnerships have been established to seek additional perspectives in the analysis and conduct of such surveys.

Proposal from the Philippines on the extension of the reporting to include Radiation Safety Culture

Ms Parami (the Philippines) gave a comprehensive presentation on the rationale for greater regulatory involvement in the safety and security of sources and of the IAEA work on developing standardised categorisation of sources and a code of conduct on the expectations of regulation of sources.

Ms Parami proposed five additional benchmarks for reporting at these workshops.

In discussions, the meeting noted the following issues:

1. The compilation of the relevant IAEA categorisations and expectations was useful information.

2. There would be significant benefits of paying closer attention to safety culture in the use and regulation of sources but the question was raised as to whether this Nuclear Safety Culture Workshop is the best avenue for pursuing source regulatory matters.
3. The reporting benchmarks were largely matters that the regulator should report on, and this could entail countries sending two delegates. The cost of this either for the country or ANSTO could be a disincentive, but more importantly, the presence of regulatory officers at all workshops could be counterproductive to full, frank and open discussions from that had previously only sent a delegate from their operating organisation delegate. *A prime aim of the project is to be a forum for the exchange of information etc.*
4. The issues of source safety and security are currently the consideration of several IAEA initiatives and whilst there might be a role for the FNCA to add weight to these initiatives, there is a concern that effort in the area of safety culture in nuclear installations might be diluted by such an expansion of the scope.

Nevertheless, it was agreed that this topic should be addressed at next year's workshop. Delegates should review the situation in their respective institutes and be prepared to discuss the issue further at the next workshop.

ANSTO staff undertook to report on the various international agency programs at the next meeting.

Status report on progress on recommendations arising out of the Peer Review of DNRR

Prof Sinh gave a status report on progress on recommendations arising out of the Peer Review of DNRR. Of the 16 recommendations, 7 recommendations (1, 2, 4, 7, and 8-10) have been essentially completed or have firm plans for completion. One of these is an extension on R10 in that a more substantial upgrade of the man-machine interface of the control panels of the reactor is proposed. This will be partly funded by EBP funds and partly by the Viet Nam Government.

NRI hopes to complete the remaining 9 recommendations over the next year.

Prof Sinh noted that there is a rapidly growing demand for power which will outstrip supply by 36,000 million kWh by 2020 if significant investment in power infrastructure in Viet Nam is not commenced soon.

The meeting congratulated Prof Sinh on the efforts to make improvements. Prof Sinh under took to provide a further update at the next workshop.

Proposal on the Consolidation of the reporting benchmarks/indicators

Dr In-Cheol Lim presented his proposal on the consolidation of the reporting benchmarks/indicators for future workshops. This proposal is based on the Self Assessment Report items agreed at the FNCA Coordinators meeting in March 2002. Dr Lim explained that many of the items in the 11 benchmarks, 6 indicators of SC activity and the NSC articles are covered at least in part in the self assessment report, and he used tables to show the relevant sections. With minor changes to the Self-Assessment Report Items, he ensured comprehensive coverage.

Several comments were made in the discussion:

- This consolidation of all the other reporting items into the self-assessment report transfers the emphasis solely onto research reactors and their associated plans and arrangements.
- Other than the above point, the changes to the self assessment items are minor and still within the bounds of the original ASCOT Guidelines indicators on which the Self Assessment Report items were originally based.
- The use of the term "finance" should perhaps be changed to "adequacy of resources". There is no intention of this group to look into the financing of institutes.
- The questions relating to siting seemed to indicate that siting could be revisited once a facility is constructed. The appropriate review is of the SAR or safety case itself, not of the siting study.

It was agreed that Mr Bastin and Dr Lim would undertake minor editorial changes, taking into account any comments received from participants and FNCA coordinators and then it would be distributed for agreement by 13 April 2004.

It was further agreed that each country would prepare and submit prior to the next meeting a baseline report on the new Self Assessment Report Items but would present only on those items that have changed since this meeting, or have not yet been reported upon. These were denoted as flowers, fruits and thorns depicting those changes that have blossomed, come to fruition or been a thorn in the side.

KAERI Nuclear Training Education Centre

Mr Han Young LEE gave a presentation on the capabilities of the KAERI Nuclear Training Education Centre.

Physical Protection and Emergency Preparedness for Nuclear Facilities in Korea

Mr Byung-Oui KHANG (Korea) gave a presentation on the new law which has recently come into force on Physical Protection and Emergency Preparedness for Nuclear Facilities in Korea. This law aims to provide for enhanced prompt response in the event of a nuclear disaster, clarify the responsibilities of relevant organisations and consider threats and conditions not previously addressed.

Recent Changes in the Nuclear Safety Regulation System in Japan

Dr Yokoyama (Japan) gave a presentation on the Recent Changes in the Nuclear Safety Regulation System in Japan, arising out of the misconduct in inspection data in TEPCO. The changes have clarified the licensee's legal obligations with respect to QA and maintenance management, PSR and periodic licensee inspections. The changes also established a new independent administrative agency (Japan Nuclear Energy Safety Organisation - JNES) as a technical support organisation to the Nuclear and Industrial Safety Agency. JNES is responsible for conduct of periodic safety management examinations to check whether utilities are implementing inspections adequately.

Experiences in Incidents and safety culture implementation

Mr Aoyagi (Japan) gave a presentation on JAPCO's response the new Japanese regulations in light of the recent misconducts in Japan. These responses include the development of an Action Charter, direct lines of communication to the company president, better communication and morale; and developing a mentality that the safety and security of the local community is maintained by safe and stable operation.

Safety culture enhancement in NPPs in China

Mr Ding gave a presentation on Safety Culture enhancement in NPPs in China. A major part of this program is the schedule of IAEA OSART, WANO Peer Review, and NPP Operation Assessment Team (NOAT) reviews. The latter is an internal Chinese peer review process. All of these have Safety Culture assessment components. Another initiative is the preparation of safety culture training material and a safety culture promotional booklet written in Chinese.

Brief updates on the Self Assessment Reports

Each country which had previously submitted a self-assessment report for peer review provided an update on their earlier report. Most of the changes were minor although Japan chose to provide an additional Self-Assessment Report, this being on the JOYO reactor. This was an option provided for in the conclusion number 17 of the FNCA 2001 Workshop on Safety Culture (Tokyo, September 2001). This was a useful insight in providing another example of such a report.

Presentations on Hofstede, Schein models and use of Socio drama

Dr Kwang Sik CHOI (KINS) gave presentations on the Hofstede and Schein models of culture, and on the use of Socio drama by KINS to help understand the different viewpoints of the various stakeholders in the nuclear industry.

Whilst the Schein and Hofstede models are now somewhat dated in the current thinking in work psychology and culture, these models help to provide a basic understanding of the concepts of culture.

The Hofstede model has as its basis five main dimensions of culture: Identity, Hierarchy, Gender, Truth and Value. For each of these dimensions, there is a scale from one extreme to the other as shown in the table below.

Dimension	**One extreme**	**Other extreme**
Identity	Collectivism	Individualism
Hierarchy	Large Power Difference	Small Power Difference
Gender	Femininity	Masculinity
Truth	Strong Uncertainty Avoidance	Weak Uncertainty Avoidance
Value	Long-term Orientation	Short-term Orientation

The Socio-drama was seen as a useful background to explain how particular sub-cultures arise and increase dialogue on safety issues.

Summary of the IAEA Senior Regulator's Meeting 16 September 2003

Mr Young–Sung CHOI (KINS) gave a presentation on the Summary of the IAEA Senior Regulator's Meeting, "Safety Management and Safety Culture: Lessons learned from Recent Events" held on 16 September, 2003 during the IAEA 47th General Conference. Emphasized during the meeting are: sufficient conservatism, sufficient resources and competence of operator, top management commitment to safety, effective system to share operating experiences, regulatory role for enhancing Safety Culture, clear and timely regulatory intervention, and regulator and licensee interface.

Peer review of Korean Self Assessment report for HANARO

A peer review was conducted of the Korean Self-Assessment report for HANARO. The findings are reported separately.

1.1 Visit to KINS

Participants were invited to visit the KINS offices and to experience a demonstration of the **C**omputerised technical **A**dvisory system for the **R**adiological **E**mergency (CARE) which is a system for gathering safety related information from all nuclear sites, and meteorological information in Korea and transmitting such information to relevant authorities, and to the IAEA under the convention for Early Notification.

2. CONCLUSIONS

1. It was noted with satisfaction that because the workshop was held in Korea, several participants from KINS and KAERI were able to attend and for many, this was their first opportunity to participate and contribute to the Safety Culture Workshops.
2. The meeting noted that there were significant developments and commitment to Safety Culture improvements in each country. Each country submitted detailed country reports and those who had previously submitted self-assessment reports for peer review had provided updates on these. Most of the changes were minor although Japan chose to provide an additional Self-Assessment Report, this being on the JOYO reactor. This was an option provided for in the

conclusion number 17 of the FNCA 2001 Workshop on Safety Culture (Tokyo, September 2001). This was a useful insight in providing another example of such a report.

3. There was also further progress in the use of Safety Committees in some institutes to review the safety of experiments, reactor utilisation and other activities.

4. The meeting welcomed the new delegate from China, Mr DING Yunfeng, who, apart from some Korean participants, was the only delegate who had not previously attended.

5. Prof Sinh (Viet Nam) gave a status report on progress on the recommendations arising out of the Peer Review of DNRR. The meeting congratulated Prof Sinh on the efforts to make improvements, having completed or having firm plans to complete 7 of the 16 recommendations, (ie recommendations 1, 2, 4, 7, and 8-10). The meeting encouraged Prof Sinh to help expedite work on the remaining 9 recommendations. Progress on the recommendation on improving the man machine interface was made possible by IAEA EBP assistance. Prof Sinh undertook to update the further progress at the next meeting.

6. The meeting considered a proposal from the Korean delegate, Dr I. C. Lim to consolidate the various lists of reporting topics, prior to the next workshop. It was agreed that Mr Bastin and Dr Lim would undertake minor editorial changes, taking into account any comments received from participants and FNCA coordinators. Comments are to be received by 30 March 2004 and the revised document will then be distributed for agreement by 13 April 2004.

7. Mr Ding undertook to prepare some notes intended to improve the process of the peer review by end of February 2004.

8. The meeting noted and congratulated the continuing work in establishing effective independence of the regulator particularly in the Philippines, Thailand and Malaysia. In Malaysia, the AELB now has regulatory jurisdiction over government agencies (including MINT). The meeting urged delegates to help and encourage, where possible, the ongoing pursuit of this goal.

9. The meeting noted the involvement of other international agencies (such as the IAEA, EBP, TC/RCA program and to a lesser extent the NEA) in the promotion of safety culture in non-power nuclear installations in the region. The meeting agreed to recommend to the FNCA Coordinators that they pursue closer collaboration with these agencies to avoid duplication; to pursue joint efforts where this will advance Safety Culture in the region; and to circulate the information from many regional or international safety-culture related activities to interested organisations.

10. It was further agreed that each country would prepare and submit, one month prior to the next meeting, a baseline report on the new Self Assessment Report Items but would present only on those items that have changed since this meeting, or have not yet been reported upon. These were denoted as flowers, fruits and thorns depicting those changes that have blossomed, come to fruition or been a thorn in the side.

11. The meeting agreed that in examining the fruits and flowers, delegates should identify at least one significant observable outcome of the seven workshops on Nuclear Safety Culture for their institute or nation.

12. It was agreed that the next meeting should include:

    - Review of the fruits and flowers in order to inform review of the indicators, identify lessons learned, outcomes achieved and to inform the future FNCA three year plan.
    - Discussion of the views on the proposal of radiation safety culture;
    - Discussion session on experiences gained in benchmarking with other institutes or other industries; and
    - Relevant items agreed with the host institute.

13. Useful and insightful presentations were provided on the following topics

    - Mr Byung-Oui KHANG (Korea) gave a presentation on the new law which has recently come into force on Physical Protection and Emergency Preparedness for Nuclear Facilities in Korea.
    - Dr Yokoyama (Japan) gave a presentation on the recent changes in the Nuclear Safety Regulation System in Japan, arising out of the misconduct in inspection data in Japan. The changes have clarified the licensee's legal obligations with respect to QA and maintenance management, PSR and periodic licensee inspections and established Japan Nuclear Energy Safety Organisation (JNES) as a technical support organisation to the Nuclear and Industrial Safety Agency.
    - Mr Aoyagi (Japan) gave a presentation on JAPCO's response the new Japanese regulations in light of the recent misconducts in Japan.
    - Dr Kwang–Sik CHOI (KINS) gave presentations on the Hofstede and Schein models of culture, and on the use of Socio drama by KINS to help understand the different viewpoints of the various stakeholders in the nuclear industry.
    - The presentation on the feedback from the EBP Safety Culture Training Workshop by Mr Situmorang and Prof Sinh was seen as useful and provided insight into the future areas of cooperation with IAEA Safety Culture in the region.
    - Mr Young–Sung CHOI (KINS) gave a presentation on the Summary of the IAEA Senior Regulator's Meeting, "Safety Management and Safety Culture: Lessons learned from Recent Events" held on 16 September, 2003 during the IAEA 47th General Conference.

14. The meeting agreed that it would consider the proposal from Ms Parami on safety culture of radiation sources at the next meeting after delegates had discussed and reviewed the proposal in detail. Delegates undertook to formulate comments and ideas in preparation for the next meeting.

15. Australia carried out two further attitudinal studies. One of these highlighted a possible discrepancy between perceived levels of safety and actual safety performance.

16. An effective self-assessment was carried out by KAERI HANARO Centre including the identification of some areas for improvement in safety. The self-assessment and peer review of the HANARO Self Assessment report was undertaken in a cooperative spirit in the context of the FNCA and was seen as an effective vehicle for fostering and strengthening safety culture.

17. It was important that two days were set aside for the peer review process (as compared to one day at the previous workshop) as this allowed more detailed review. The peer review identified some additional good practices and made 15 additional recommendations for improvement.

18. The Self-Assessment and Peer Review process was seen as valuable. During the peer review process, the KAERI staff exhibited ownership, frankness and openness and this was conducive to the completion of the review and a positive indicator of the safety culture in itself.

19. The delegates felt that real, meaningful and practical recommendations had been made for improvement of Safety Culture at HANARO. Nevertheless, options should be considered for improving the process without impinging on the time available for the other workshop presentations and considerations. One option might be to use a dedicated review team and this could allow more time for fulsome discussion of safety culture. It is proposed to discuss the issue further at the next meeting.

20. The meeting agreed to continue the self-assessment and peer review process. It was agreed that it would be beneficial for the peer review to be conducted on the research reactor at the host institute of the next workshop.

21. The meeting agreed to recommend to the FNCA Coordinators Meeting that the next workshop should be held in Indonesia, subject to agreement of the Government of Indonesia. The timing of the next workshop is a matter for further discussion, but it was suggested by Mr Situmorang that December 2004 appeared to be appropriate. If possible it would be preferable to avoid a clash with the FNCA Ministers Meeting but the dates for this have not been finalised.
22. Mr Bastin undertook to update the three-year plan for the project, to seek the agreement of delegates by email and to resubmit the plan to the next FNCA Coordinators Meeting in 2004.
23. The visit to KINS provided a valuable insight into real-time data collection for dealing with radiological emergencies in Korea.