FNCA SAFETY CULTURE PROJECT

MINUTES OF 2002 WORKSHOP

14-17 JANUARY 2003 IN DALAT, VIETNAM

The workshop was opened by a warm welcome from Mr Nguyen Dinh, Vice Chairman of the Peoples' Committee of the Authority of Lamdong Province, and Mr Le Doan Phac, Deputy Director Department of International Relations and Planing, VAEC.

Mr Bastin, Acting Manager, Safety and Reliability, ANSTO replied and thanked the Vietnamese hosts for their preparation and welcomed delegates on behalf of ANSTO.

Opening remarks and summary of the NSC meeting by Prof Ishikawa (Japan)

Prof Ishikawa (Japan) noted from the NSC meeting in April 2002 that only a few additional states had signed up to the convention since the previous meeting, but there has been a significant increase in number and quality of delegates demonstrating significant commitment. The meeting had been very successful in that almost all countries fulfilled commitments to improvements made previously. The rapporteur and chair of each group came from a different group. The main focus was on operational and maintenance aspects of safety, closely tied to safety culture.

Brazil Conference Summary

Mr Bastin (Australia) presented a personal summary of the Brazil conference. The main aspects for him were (1) insights by Schein, Packer, etc; (2) Survey and assessment work by Helen Rycraft BNFL and others of great interest; (3) Impressive work done in Eletronuclear Brazil in the merging of two disparate companies in the nuclear industry; and (4) productive discussions on the progress being made in various countries and organisations and improved contacts with people working in the fields. However, there was nothing emphatically new and although there was much discussion on assessing safety culture, there was not much about what to do with the assessments and how to improve things.

Country Reports

The Country reports include reports on the six indicators of activity in Safety Culture, the 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.

Significant 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 some inspection and

advisory role in MINT facilities although not strictly a regulatory role. In Thailand, there is growing effective separation of the regulatory activities and it is awaiting drafting and passage of a proposed law to finalise the creation of a separate regulatory body. In the Philippines, a division of PNRI has been established to exercise the regulatory role carried out by PNRI and it is anticipated that one day this division will achieve some greater independence from research and operational activities in PNRI, and consequently expand its regulatory role to cover all PNRI facilities.

Significant progress is being or has been made in the development or update of SARs for research reactors, particularly in Vietnam, Australia, and Korea.

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

In Indonesia, there are local arrangements governing safety but these are 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.

Korea and Malaysia carried out further attitudinal studies, although the survey from Malaysia is still to be analysed.

Schein model of culture

Peter Marshall (Australia) gave a presentation on the Schein model and its implications for safety culture. The emphasis on cultural change caused some confusion between 'safety culture' change and changes to 'national culture'. However, the intention of the model is to attempt to understand how cultures and subcultures arise and continue in an organisation, and to recognise that it is difficult to change behaviours (an observable feature and therefore considered an artefact of the culture) without addressing the underlying beliefs and assumptions (also part of the culture).

The presentation attracted considerable attention from delegates. It might be useful to conduct workgroups to discuss Schein further at the next workshop.

Hamaoka NPP Hydrogen Explosion in RHR line

Mr Keiji Hirai (Japan) gave a presentation on the hydrogen combustion explosion that occurred in the Hamaoka-1 NPP in a steam condensing mode line of the Residual Heat Removal System. This event occurred when the High Pressure Core Injection system was undergoing a surveillance test. The steam condensing line is a non-safety related part of the RHRS and includes a length of pipe that is normally isolated. It appeared that the explosion had occurred when a pressure pulse ignited hydrogen and oxygen (produced by radiolysis and trapped in this "dead-leg" part of pipe that had never been used).

The ignition had been facilitated by the presence of noble metals injected previously to minimise stress corrosion cracking.

The event highlighted the following lessons learned:

- failure to take account of operations experience in foreign BWRs;
- experience and knowledge in the early treatment of much earlier but related events had not been transferred to subsequent generations; and
- prior to the installation of said piping, there was lack of consideration that hydrogen gas could potentially collect due to the “dead-leg” of the RHR steam condensing line.

Cover-up of Inspection Data revealing cracking in TEPCO BWR Core Shrouds

Prof Ishikawa (Japan) gave a presentation on the “scandal” involving the cover-up of inspection data which revealed cracking in TEPCO BWR Core Shrouds. In general, the safety significance of these cracks was considered to be not so great, but the environment (growing competition in operational performance of NPPs in other countries); the culture of the time (glasnost in eastern Europe, and growing openness of nuclear safety regulation in USA); and the “zero-tolerance” regulations on crack size for reactor internals is thought to have contributed to the mindset that effected the cover-up. For these reasons, the “scandal” has implications for safety culture. The Regulator increased the severity of penalties for such violations; increased the frequency and intensity of inspections and introduced a relaxation of the tolerances for crack size (from zero to a small practical size).

Overview of Self-Assessment Reports

The Workshop broke into two groups to consider the self-assessment reports and prepare an overview of highlights, good practices and potential areas for improvement.

Group 1	Group 2
Considering reports: Australia, Korea, The Philippines, and Thailand	**Considering reports: Indonesia, Japan, Malaysia, and Vietnam**
Mr Simon Bastin (Australia)	Dr Masashi Hirano (Japan)
Dr In Cheol Lim (Korea)	Mr Peter Marshall (Australia)
Ms Vangeline Parami (The Philippines)	Mr Johnny Situmorang (Indonesia)
Prof Nguyen Mong Sinh (Vietnam)	Mr Mohd Yusoff Ibrahim (Malaysia)
Mr Sirichai Keinmeesuke (Thailand)	Mr Keiji Hirai (Japan)
Dr Yoshihiro Nakagome (Japan)	Prof Michio Ishikawa (Japan)
Mr Minoru Kubo (Japan)	Mr Hideo Nakasugi (Japan)
Mr Mitsutoshi Odera (Japan)	Mr Nguyen Nhi Dien (Vietnam)
Mr Tran Chi Thanh (Vietnam)	

Having considered these country reports, the two groups rejoined and reported. The overviews were collated into the following list of highlights, good practices and potential areas for improvement:

Good Practices

1. All countries had either achieved effective independence, or had made significant steps toward this goal. However, there are some difficulties in the implementation of this goal in some countries, and there is significant variation in the current extent of achievement of this implementation.
2. The review and revision of research reactor SARs are being, or have been, carried out in most countries, so that most institutes had a current SAR in place or were in the process of revising it. The SAR for the Philippine reactor was current at the time it was shutdown.
3. There is an active Safety committee in most of the institutes reporting although in the Philippines this committee is not active and there is a need to reconstitute the Committee and clarify its tasks in order to be consistent with the recently issued Safety Policy.
4. Activities to foster the safety culture have been initiated in most of the countries.
5. Emergency drills are being carried out regularly (with the exception of the special case of The Philippines) but the frequency of such exercises could be improved in some countries. Also, the cooperation with local (and in some cases, central government) could be improved in some cases.

6. Criticality assessments seemed to be current in all institutes reporting to this workshop. The resourcing of criticality assessment teams varied in different institutes, reflecting the different assessment requirements.
7. There was some work towards greater openness and communication with the local community in many countries. Several reported having “open days” or “open house” days, some with significant attendance by the public.
8. One institute (KAERI) was working to prepare a textbook on safety culture.
9. It was also noted that this self-assessment process serves as a benchmark for improvement.

Potential areas for improvement

1. Quality assurance certification is lacking in the reactor institutes of Indonesia, Japan, Philippines, Thailand, Malaysia and Vietnam, although Indonesia, Malaysia and the Philippines have plans to obtain certification.
2. There is a lack of resources in some areas of several countries. In some cases the shortage of staff resourcing of the regulatory body cold pose a challenge to the independence of the regulator. In another case, the shortage of staffing of reactor operations meant that the operators and researchers were sometimes effectively the same people, posing the challenge to the single-mindedness of the staff performing operations duties.
3. Ageing management is one of the most important areas where there is potential for improvements. Management of ageing systems, structures and components needs to be undertaken with strategic goals in mind. Nevertheless, two countries had undertaken or will soon undertake remaining life studies of their reactors.
4. The monitoring and evaluation of the effectiveness of the activities including education and training and safety culture activities could be improved in most institutes reporting.
5. There was evidence in some institutes that root cause analysis was not as comprehensive as it could be. Also it was recognised that the limited sources of reactors around the world of similar design could discourage the adoption of external operations experience feedback and could lead to a sense of insularity or complacency that there was not opportunity to learn from outside.

Peer review of Vietnam Self Assessment report for DNRR

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

Conclusions

1. It was noted with satisfaction that because the workshop was held in Vietnam, delegates from VAEC, the Institute of Human Studies and the Institute of Energy were able to attend and 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 self-assessment reports for peer review and each country had made significant progress. For example, most institutes now have an active Safety Committee to review the safety of experiments, reactor utilisation and other activities; Three countries have updated and revised the Safety Analysis Report for their research reactor.

3. The meeting welcomed the new delegate from Thailand, Mr Sirichai Keinmeesuke, who was the only delegate who had not previously attended.

4. It was recognised that, because of the increased experience and confidence in the delegates, and the adoption of the proposal by Prof Sinh to share the role of chair throughout the meeting, this Workshop had achieved greater participation and interaction of delegates.

5. The meeting agreed to consider the suggestion that the newly issued IAEA document "Code of Conduct for Research Reactors" might serve as a more appropriate basis for reporting than the Nuclear Safety Convention Articles 7-10, 14, and 16. This suggestion was conveyed from Ms Carnino (IAEA) at the Brazil Conference on Safety Culture in Nuclear Installations (2-6 December 2002).

6. In discussing the country reports it was noted that there was an increasing number of lists of indicators, benchmarks and topics on which member states were expected to report. The delegate from Korea, Dr I. C. Lim, undertook to examine the lists of indicators, benchmarks, articles and topics together with the new Code of Conduct and consider whether it would be appropriate to formulate a consolidated list of reporting topics, and if so, to draft such a list, based on the code of conduct, present peer review report form, 11 benchmarks and 6 indicators. This would need to be prepared prior to the next workshop. If agreed at the workshop it could form the basis for reporting at the subsequent workshop.

7. All countries had either achieved effective independence of the regulator, or had made significant steps toward this goal. However, there are some difficulties in the implementation of this goal in some countries, and there is significant variation in the current extent of achievement of this implementation. The meeting urged delegates to help and encourage, where possible, the pursuit of this goal.

8. The self-assessment and peer review of the Vietnam DNRR Self Assessment report was the first to be conducted in the FNCA Nuclear Safety Culture Project and as such was intended to be a trial process. The process 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. Despite being the first of a trial process, the delegates felt that real, meaningful and practical recommendations had been made for improvement.

9. The meeting agreed to continue the self-assessment and peer review process by asking delegates to provide an update on their self-assessment reports three (3) months prior to the next workshop. For those countries with more than one research reactor, it would be useful to extend the self-assessment to one other reactor. A peer review would then be conducted on the research reactor at the host institute of the next workshop.

10. The presentation on cultural aspects in Vietnam from Dr Trinh Thi Kim Ngoc was seen as a constructive involvement of disciplines from outside the nuclear and radiation safety context and gave useful insights into the national and regional culture in Vietnam.

11. The presentation on the Schein model of culture was seen as a useful background to explain how particular sub-cultures arise.

12. The presentation on the feedback from the Brazil conference by Mr Bastin was seen as useful. Messrs Odera and Bastin had copies of the conference program and Mr Odera offered to supply any reprints of papers requested by delegates.

13. The presentation by Mr Hirai on the Hamaoka incident provided valuable lessons learned on "inter-generational" corporate learning, taking proper account of operations experience in similar overseas reactors, and undertaking thorough safety assessments of change.

14. The presentation by Prof Ishikawa on the TEPCO "scandal" highlighted that, although the falsified data were not, of themselves of great safety significance, an environment and culture that allowed non-disclosure of important safety-related data, had existed, and thus the scandal has implications for the study of safety culture.

15. Two countries carried out further attitudinal studies (one from Malaysia is still to be analysed).

16. The meeting agreed to recommend to the FNCA Coordinators Meeting that the next workshop should be held in Korea, subject to agreement of the Government of the Republic of Korea. Alternatives are the Philippines and Australia. Because the next workshop will continue the peer review process it would be preferable but not necessary to hold the workshop in a country with an operational research reactor. The timing of the next workshop is a matter for further

discussion, but it is preferable to hold it between August 2003 and the subsequent National Coordinators' Meeting to be held in March 2004.

17. Mr Bastin undertook to draft a three-year plan for the project, to seek the agreement of delegates by email and to submit the plan to the next FNCA Coordinators Meeting in March 2003.