TOPICAL ISSUE 2: USE OF OPERATING EXPERIENCE - MANAGING CHANGES EFFECTIVELY

PROACTIVE SAFETY MANAGEMENT STRATEGIES RELATED WITH THE OPERATING EXPERIENCE PROCESS

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Beijing, 18 – 22 September 2004

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International Atomic Energy Agency

INSAG 15 - Key Practical Issues in Strengthening Safety Culture

- This IAEA document issued in 2002 states that ***most incidents and accidents in the nuclear industry have occurred because someone has failed to take the relevant precautions or has failed to consider or question in a conservative way, decisions that they have made, or the steps which were taken to implement them.***

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In the last three years, significant incidents have occurred, including some in very mature national nuclear programmes.

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- **At Davis Besse NPP in USA, deposit indications of boric acid leaks on the Reactor vessel head had been noticed since 1998 but further extensive inspections were not performed and proper measures against defects were not taken.**

- **Subsequently, in 2002 a cavity was discovered with only the layer of the stainless steel liner remaining to contain the primary circuit.**

•At Brunsbuettel NPP in Germany late 2001, indications of water leakage within the reactor containment was detected.

•Plant management made a decision to continue operation because they considered the leakage had been isolated and was insignificant.

A subsequent inspection in 2002 showed that a piping section of a reactor head spray line had been completely destroyed by a hydrogen explosion.

At Paks NPP, Hungary in 2003, the cooling flow to a fuel cleaning device containing 30 *hot* nuclear fuel elements was lost due to incorrect operation and inadequate design of the cooling loop. This led to the complete destruction of the fuel elements in the cleaning device.

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TEPCO EVENT

- **At TEPCO, Japan, various maintenance inspections and works were inadequately recorded, analysed and reported. Some records were even found to have been falsified. These included repairs on important equipment such as the core shroud of the reactor. Other involved the falsification in the execution of containment leak rate test in order to present acceptable results.**

- **All NPP's from TEPCO were shutdown in March/April 2003 for inspection purposes.**

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LACK OF RESPECT!!!

- **In all of these four events, an apparent *lack of respect* with the reactor internals and components could be deduced. How this could had happened?**

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COMMON CAUSES AND CONTRIBUTORY FACTORS

- **Decision making process in a situation that conflicted with the planned PRODUCTION process.**
- **Reliance on recent successful operating performance history.**

- **Lack of full consideration of all available information, with potential consequences… (minor events?)**
- **Insufficient review to assure that all pertinent information was considered and analysed… (minor events?)**

- **Insufficient challenge of assumptions or a desire to look for *alternate acceptable explanations* that supported continued operation.**

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- Some of these important problems had initially been treated as minor deficiencies within the close boundaries of normal engineering or maintenance and were not analysed more broadly.

ONCE MORE INSAG 15

- *Failures and near misses are considered ...as lessons learned which can be used to avoid more serious events.... all employees need to be encouraged to report even minor concerns---**in a good reporting culture, it is accepted that it is the failure to report any issue** that may adversely affect safety.*

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- **With the increasingly attention of the nuclear industry in developing and enhancing operational safety assessment programmes, the number of significant events has been reduced, and the operating plant performance indicators have been steadily improved.**

- **And with the apparent pressure of demonstrating an improved business performance, sometimes significant events are classified as being only *reportable inside the plant or utility,* and reluctantly only *few may* be sent to the international community to be included in international data banks.**

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Indicators based on significant events show encouraging trends and are therefore considered very positive.

Since there are less important events, complacency with non observance of the low level events can take place.

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Since the level of the threshold for reporting of events remain at the same position, one very important aspect has the potential to be hidden:

The majority of possible lessons learned, i.e. the minor events and near misses lay below this threshold, populating an area of augmented proportion of required awareness and assessment.

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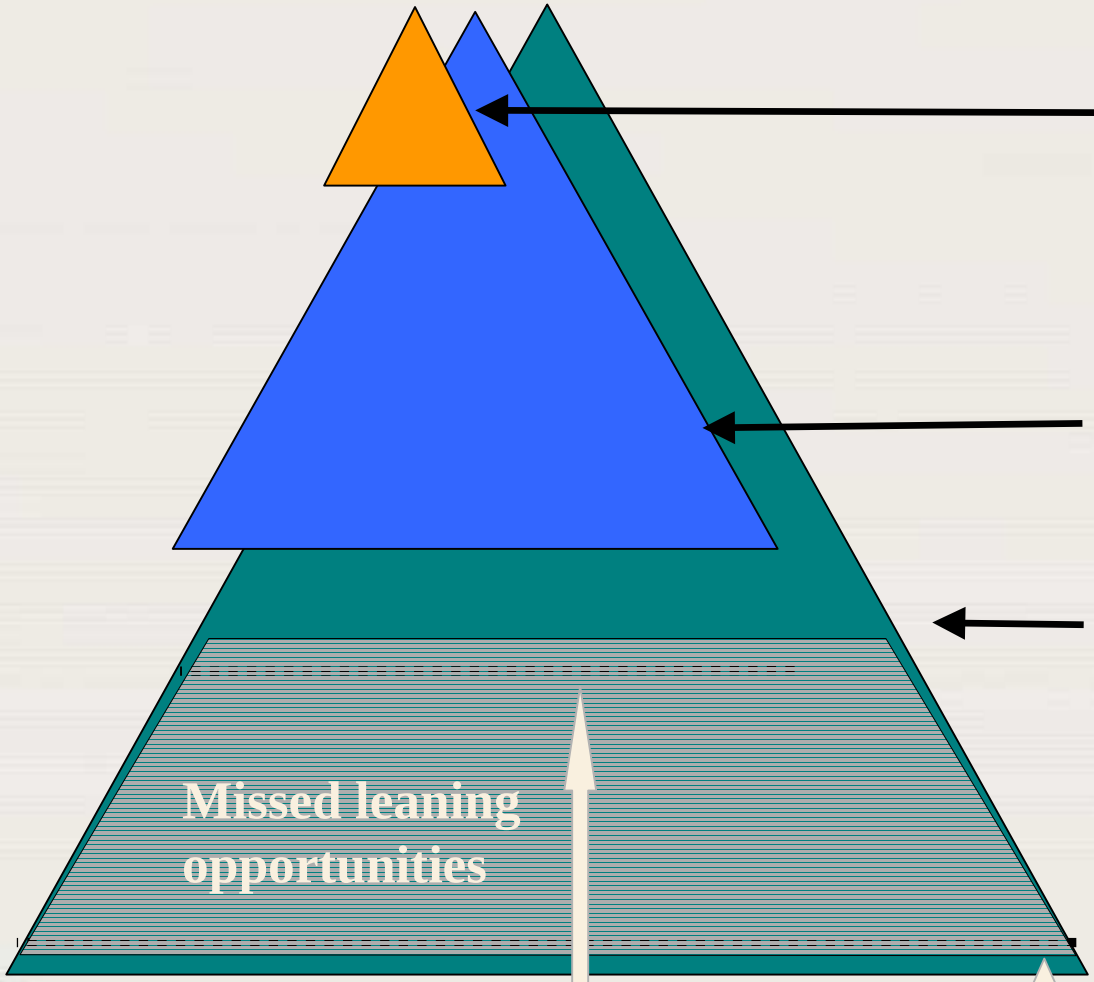
EVENTS


High Significant Events (few)
Significant Events (several)
LLEs & NMs (thousands)
Missed leaning opportunities
Existing threshold for identifying LLEs
Desirable threshold

- **To maintain the reporting threshold within the plant or utility, *to those events reported to the regulator or the international industry*, has the considerable potential to send the wrong (or at least ambiguous) message to the operating floor.**

- **This concept may engender a false and potentially dangerous perceived reporting philosophy, in that the operators only report circumstances to their supervisors and managers that would be only reportable, *under the regulatory requirements.***

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IAEA response

- **The Agency has developed a Technical Document on : *The use of low level events and near misses process to enhance the operational safety performance at Nuclear Power Plants*, that will be published later in 2004. This document gives examples and definitions, suggesting different means to identify, promote and report such events.**

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IAEA response

- **The IAEA PROSPER service has been developed from the successful IAEA-*ASSET* programme, to assess the effectiveness of the procedures, processes and programmes, related with the operating experience process adopted by plants, to ensure that lessons are learned, and are used proactively to enhance operational safety performance.**

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ANOTHER EVENT RELATED TO THE INADEQUATE ***OE*** PROGRAM: THE MIHAMA 3 EVENT IN JAPAN

- Recently in 2004, an event involving a leak of high temperature steam from a secondary circuit pipe, due to erosion/corrosion, killed five contract workers and injured several others.

- Erosion/corrosion in secondary steam and water systems, is a well identified phenomena, and significant operating experience is available.

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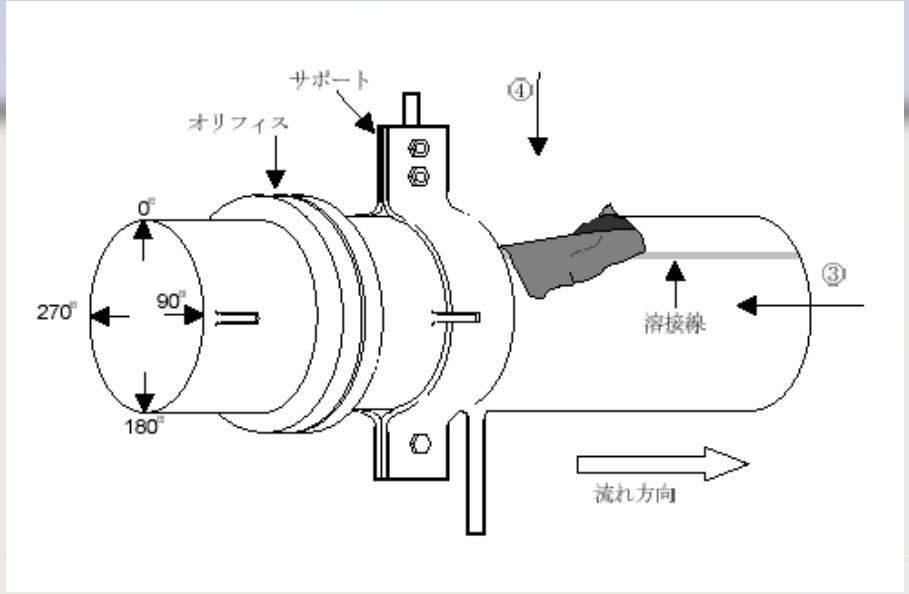

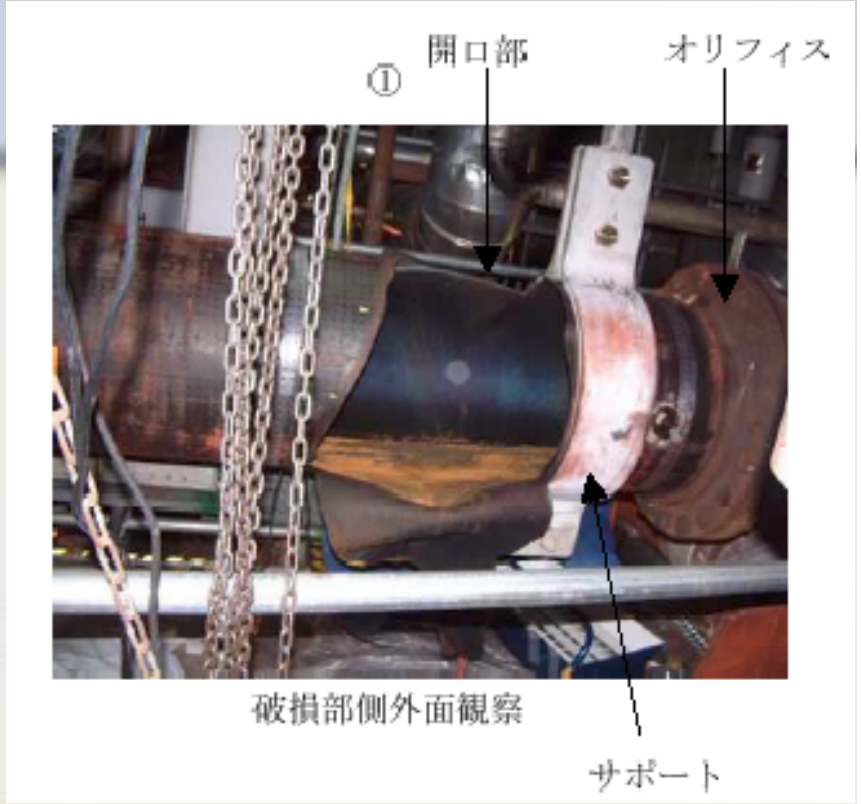

The operating experience feedback process was not adequately and comprehensively implemented at KEPCO.

Excessive reliance on the contractor without independent verification was one of the contributors for the event.

OPERATING EXPERIENCE FEEDBACK PROGRAMMES

All these factors and contributors in basically all events here presented, demonstrate insufficient consideration of the Operating Experience Feedback programmes. ***Either to proactively identify situations of potential safety concerns learned from experience by others, or to identify and rectify early in-house indications of issues, through apparently minor deficiencies.***

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A MESSAGE OF COMPLACENCY?

The inadequate and ineffective use of operating experience programme, together with the desire of senior management to minimise the number of operational events reported, may send a message of complacency to all the organization...

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AMBIGUOUS EXPECTATIONS?

…a message that is often supported by a decreasing graph of reportable events, in a monthly performance report. This has the potential of a perfect combination to contaminate the entire organization with ambiguous expectations and perceptions.

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- **It has often been stated that “*the managers set the tone how the operating floor will play the game*” and that *“it is not what it is said in slogans that will effect plant personnel attitudes, but the actions performed by the managers towards their objectives*”.**

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- **The final practical result of the perceived message by the operating floor, may again lead to inadequate analysis of issues. There may be a tendency, to only report good news and even hide the results that demonstrate poor performance, thus preventing the identification and implementation of effective corrective actions.**

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QUESTIONS FOR DISCUSSIONS

1. How should the process of ***low level events and near misses*** be more widely applied throughout the nuclear industry?

2. How could the nuclear industry use more comprehensively and extensively the operating experience programmes already in place? How could the IAEA *reinforce* to the Member States the need for the use of such programmes?

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QUESTIONS FOR DISCUSSIONS

3. The existing process of dissemination of important events are not timely and comprehensively shared among the nuclear power plants and the nuclear organizations around the globe. Should the international organizations (WANO and the IAEA) work together towards an international programme to implement a common *SOER* system?

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QUESTIONS FOR DISCUSSIONS

4. How could the nuclear industry be more receptive to the IAEA safety services, such as OSART and PROSPER for example? Should not exist an international binding policy requiring international peer reviews of different origins at some regular intervals?

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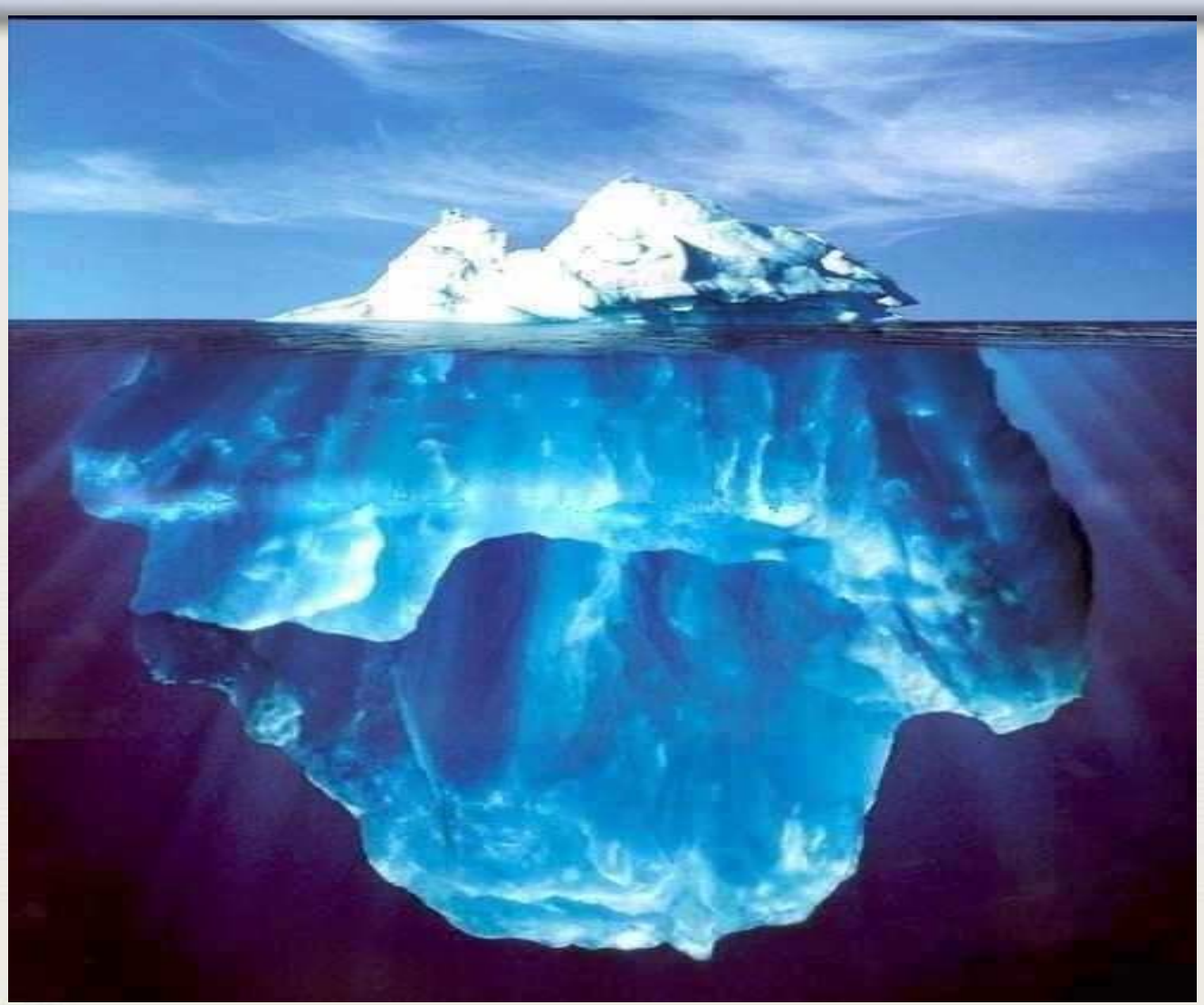
THE ICEBERG



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“ What fools you are! ...You boast that you have learned from your mistakes. I prefer to learn from others' experiences and avoid the price of my own.”

(Otto von Bismarck)