Contribution ID: **61** Type: **Oral**

The Application of Systemic Safety for Smaller Nuclear Installations

Thursday, 25 February 2016 14:30 (30 minutes)

Synopsis

About ARPANSA

ARPANSA is the Australian Radiation Protection and Nuclear Safety Agency and is the Australian Government Statutory Agency and national centre of excellence in radiation protection and nuclear safety. ARPANSA has regulatory responsibility for all Australian Commonwealth Government users of ionising and non-ionising radiation across a broad spectrum of controlled activities including a 20MW research reactor and associated facilities.

The Paper

This paper will provide an outline of ARPANSA's approach to systemic safety as applied to smaller hazard nuclear installations. It will describe ARPANSA's effort to enable licence holders to better understand the principles of systemic safety so that they may make improvements for themselves. In regard to human and organisational factors, inspections are more often used to highlight areas where performance can be improved to meet best practice rather than strictly as a compliance tool. This takes account of a graded, risk informed approach and is undertaken in a collaborative way that places a premium on openness, clarity, reliability and efficiency.
The paper will discuss the challenges faced by the approach, and how ARPANSA is currently managing these. It will describe ARPANSA's regulatory guidance and inspection processes. The significant stages in ARPANSA development of the systemic approach are provided briefly in the following paragraphs.

Outline of ARPANSA's Systemic Approach

In 2011 work commenced to develop a holistic approach to safety that considers the technological aspects of safety alongside organisational and human factors. The work was influenced by research into common contributing causes of accidents which indicated that the interrelationships between technology, human and organisational factors were the key to robust controls for safety that builds safer operations.
In 2012 ARPANSA made available its regulatory guidance on holistic safety via the ARPANSA website that explains the basis for the holistic approach. This guidance was informed by modern safety science including published academic research, and the implementation of similar approaches by nuclear regulators and operators as well as other high reliability organisations. ARPANSA's guidance is based around seven key characteristics for safety, namely:
• Human aspects
• Non-technical skills
• Defence in depth
• Management Systems
• Resilience
• Safety Culture

• Protective Security and Nuclear Security Culture

The original website has since been supplemented with additional material including tools for gauging the holistic safety of an operator. The tools are designed to assist licence holders in understanding and improving the safety of their operations. These tools are freely available to be used by licence holders as well as by regulatory staff.

Alongside the ARPANSA role of assuring compliance to legislation, it has been actively socialising the holistic approach to safety and promoting its benefits. This is in-line with an approach of fostering a healthy and robust safety culture through collaboration with licence holders.

ARPANSA has also implemented a specialist thematic inspection programme that was aimed at examining the organisational and human factors associated with specific business activities and across divisional boundaries within a licence holder. In 2015 following a general updating of the ARPANSA inspection programme, the thematic inspections were placed on hold in favour of a new inspection approach that examines human and organisational aspects of safety against a set of performance objectives and criteria.

Regulatory staff involved in the development of the holistic approach is closely involved in the new inspection programme. Staff participate directly in inspections, analyse inspection performance, develop inspector training, and where a need is identified may undertake augmented inspections to address specific issues.

Country or International Agency

Australia

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Yes

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Session Classification: SA3: Systemic Approach to Safety