Lancaster University Management School

Safety Culture and Beliefs in the Nuclear Industry: Looking Forward, Looking Back

Professor Sue Cox OBE

Dean Emeritus

Lancaster University Management School

Sue Cox

- Chair of **Safety & Risk Management**, University of Lancaster & **Dean Emeritus** of the Lancaster University Management School;

- **OBE** awarded for services to the social sciences
- **Fellow** of the Academy for the Social Sciences;
- **Fellow,** British Academy of Management
- **Companion,** Chartered Management Institute

- Independent Member: **Sellafield Nuclear Site License Committee**
- Former Member: **NUSAC, COMARE, DNSC & Magnox EA Committee**
- Vice President: **European Federation of Management Development**
- **Applied research** in high hazards industries including off-shore and those in the including those in the nuclear sector; widely published

AIMS

- To consider the current utility of the concept of safety culture in the context of the nuclear industry
- To provide a challenge to current beliefs about safety culture given the longevity of this concept
- To explore future developments of this concept in assuring safety performance in the nuclear industry during a period of change

Chernobyl Power Plant: 26th April 1986

Birth of concept of safety culture (INSAG 1988)

Safety culture highlighted in other incidents

Definitions: The way we do things around here

Safety culture describes that assembly of characteristics and attitudes in organizations and individuals which establishes that, as an overriding priority, nuclear plant safety issues receive the attention warranted by their significance (IAEA, 1991)

The safety culture of an organisation is the product of individual and group values, attitudes, perceptions, competencies and patterns of behaviour that determine the commitment to and the style and proficiency of an organisations health and safety management (ACSNI, 1993)

A plethora of derivative definitions have followed.

Models and Measures

- Safety culture modeled as a separate entity or as an emergent property of the total socio-technical system
- Measures and monitoring focused on identifying the basic dimensions of safety culture or key elements: multi-methods required as appropriate to dimensions or elements and cultural context
- Literature has identified key dimensions or elements as including: basic beliefs, assumptions, behaviour and practices, shared meaning in teams, norms of behaviour and experience, knowledge and understanding

Actors

- **Nuclear Operators:** their management and employees: *Improving the way that we do things around here*
- **IAEA, WANO, INPO & Regulators:** Guidance and monitoring
- **Scientific Community:** Questioning:
- Role of safety culture in accident aetiology and its interaction with other critical factors
- Measurement as an entity or as a system outcome
- Development and evaluation of interventions and their evaluation against safety performance data

Utility

- Focused attention on role of human and organisational factors in nuclear safety
- Encouraged collaboration among operators, regulators and industry bodies, and scientific researchers
- Provided a framework for the measurement of human and organisational factors and also a focus for data-driven discussions on safety improvement
- Initiated the development of interventions focused on safety culture such as behavioural safety, leadership and organisational learning
- Provided an assurance of quality for stake-holders

Looking Back (1)

- Nuclear sector has played a leading role in the operationalisation and use of safety culture
- Consistent with genesis of thinking on major accident aetiology **but** with focus on *what not to do* rather than *what we do well*
- On occasions, it has been used as an excuse for not addressing more fundamental safety problems in plant design and management
- **Caution**: Safety culture is context dependent: **no** *one size fits all* or *silver bullet interventions* feasible; architecture of employee attitudes to safety vary within and between organisations: awareness of sub-cultures

Looking Back (2)

- Leadership and management behaviours have been shown to be of paramount importance including modeling behaviour and appropriate use of power
- Over reliance on a belief that a strong safety culture exists and on the power of indicative measures: complacency
- Managing both individual and team roles including those of functional job holders in strengthening safety culture
- Managing cultural diversity and change: Multi-cultural operation of NPPs and of supply chain networks

Looking Back (3)

- Challenge to sector to optimise organisational learning
- LearnSafe reported that barriers to organisational learning included: limited organisational resources and conflicting priorities, formal systems and procedures, lack of openness, trust and reward system and inadequacy of means and methods
- Failure to recognise trust as a critical factor in the success or failure of safety culture interventions
- Despite the challenges to the nuclear sector, there has been an over-riding belief that ***we are too good to fail***.

Looking Forward (1)

- Major changes in nuclear sector globally, including new build, decommissioning and multi-tasking, require new mindsets.
- Changes in world of work: ageing and culturally diverse workforce, multi-tasking, increased mobility and need for fairness
- Cultivation of professionalism across sector which encompasses regional, national and international sensitivities
- Even greater collaboration and team working necessary to deal with increased complexity

Looking Forward (2)

- Need to review relationship between *organisational* and *safety cultures* and need for more *real time* data
- Questioning way of working within a project mindset and with multi-tasking teams
- Creating empowered and empowering leadership at all levels
- Achieving a just culture which encourages the reporting of incidents with reasonable impunity and which facilitates individual and organisational learning

Conclusions (1)

- Need to go *back to basics* and ask what *safety culture* is and what it is not?
- Safety culture is about people in their organisational context: the behaviour of employees, their managers and leaders and also that of their organisation
- It is an emergent property of the socio-technical system that differs with context and which changes with time

Conclusions (2)

- Nature of safety culture and of necessary interventions is context dependent - *one size does not fit all* – and is part of a wider system

- Renewed emphasis required on human and organisational factors but within their scientific and technological contexts

- Opportunities for nuclear sector and its collaborators to maintain its leading position globally in the area of safety culture!

Thank You