Practical Considerations for Implementation of SI Units –

A View from the Nuclear Power Industry

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Topics

• Overview of Exelon Nuclear Fleet
• Barriers to conversion
• Ways to overcome these barriers
• Timing of potential conversion
Exelon Nuclear Fleet
One Fleet, One Vision
To be the best operator of nuclear plants worldwide
U.S. Nuclear Industry Employment Distribution by Age

**Total Employment:**
- 2015: 56,568
- 2013: 62,167
- 2011: 59,700
- 2009: 57,200
- 2007: 55,900
- 2005: 57,900
- 2003: 58,400

**Age Range Distribution:**
- 18-22
- 23-27
- 28-32
- 33-37
- 38-42
- 43-47
- 48-52
- 53-57
- 58-62
- 63-67
- 67+

**Trends:**
- 2013 Trend
- 2015 Trend

**Employment by Age Range:**
- 2003
- 2005
- 2007
- 2009
- 2011
- 2013
- 2015
Barriers to Overcome – Technical/Human

- Worker Demographics
  - Approx. 100,000 nuclear workers overall
    - 56,000 utility workers
      - 65% or 36,000 persons have no formal education beyond high school
    - 44,000 supplemental workers (e.g. laborers, carpenters, millwrights, welders, radiation protection technicians, etc.)
- Potential for significant HU events
  - RP technicians
  - Workers
Barriers to Overcome - Economic

• Significant Costs to convert
  – Procedures
    • Conversion to new units
  – In-Plant Instrumentation
    • Modifications required to control room instrumentation and in-plant radiation monitoring equipment
  – Radiation Detection Instruments
    • Personnel Dosimetry and Electronic Dosimetry
    • Hand Held radiation detection instruments
  – Training

• Cost Estimates per Unit Power Facility
  – Facility Modifications – Six to ten of millions dollars (or more)
  – Rad Detection Instruments – 2 to 4 million dollars
  – Procedures and training – 400 to 500K dollars
Can the Barriers be Overcome?

• Is there a burning platform or driver for this change?
• Is the Cost to make the change worth any of the perceived benefits?
• Is there funding that will be provided to make the change or will we saddle the utilities with the costs?
Timing on the Changes

• Based on the cost to benefit for the change the nuclear industry would recommend deferral of the change
  – Large cost to implement
  – No improvement in worker safety to align to the SI units

*Fundamental question* – “Is the juice worth the squeeze?”
Binika Shah
Senior Project Manager
World Nuclear Association
Global nuclear industry view of units & quantities

- Current system (even with SI units) difficult for public to understand - additional complexity in complicated RP system important for all situations but particularly during/after an emergency.
- Consistency and harmonisation supports increasing international market.
- Understand impact - significant cost and behavioural change associated with move to SI units (does not happen overnight); if change, allow for phased and long transition time.
Thank you for your Attention