

# Enabling the convergence of mechanical nuclear codes and standards requirements



Dr. Andrew Wasylyk  
Project Manager - CORDEL

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# International Harmonisation

- Applicable and internationally recognized set of Safety requirements
  - IAEA standards underpin safety in all countries
    - Higher level in standards hierarchy, not enforceable
    - Supplemented by enforceable national regulations
- Need harmonization of more detailed requirements
- Need also an effort on the Industry side:
  - Codes and Standards that are recognised as equivalent by industry (necessary for acceptance being considered by regulatory bodies).
  - A harmonization effort is required to identify differences and recognised equivalences between major codes.

# Promotion of Harmonization of Standards and Codes

## ➤ **Regulators: MDEP**

➤ Canada, Finland, France, India, Japan, Russian Federation, South Africa, the UAE, The UK, the USA, China, and Sweden

➤ 1 common position and four technical reports

## ➤ **Standard Development Organizations: SDO Board**

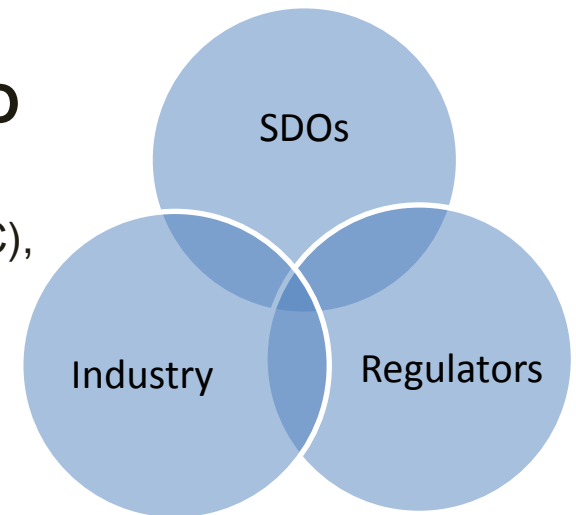
➤ ASME BPVC III div.1, AFCEN (RCC-M), KEA (KEPIC), JSME (S-NC1), CSA, (N285.0) NIKIET (PNAE-G7)

<http://files.asme.org/STLLC/31181.pdf>

## ➤ **Industry: WNA CORDEL**

➤ The international voice of the industry promoting convergence of nuclear design codes

➤ **Interfaces** with regulators, SDOs, vendors and industry experts



# Building a framework - Qualifying differences and similarities

## **A1 = Same**

Requirements classified as category A1 are considered to be technically identical.

## **A2 = Equivalent**

Requirements are considered to be equivalent when applying either code or standard, if compliance with the applied code or standard will also meet the requirements of the other code or standard.

## **B1 = Different – Not specified**

Requirements are considered to be different –not specified, if one code or standard includes requirements that the compared code or standard does not specify

## **B2 = Technically Different**

Requirements are considered to be technically different if either code requires something more or less than, or otherwise technically different from, the requirements imposed by the other.

# Building a framework - Definitions

**Convergence** – the process of establishing the same or equivalent code requirements in order to increase the areas identified as “same” or “equivalent,” as identified by the Standards Development Organisations (SDOs) in their Code Comparison Report (ASME STP-NU-051).

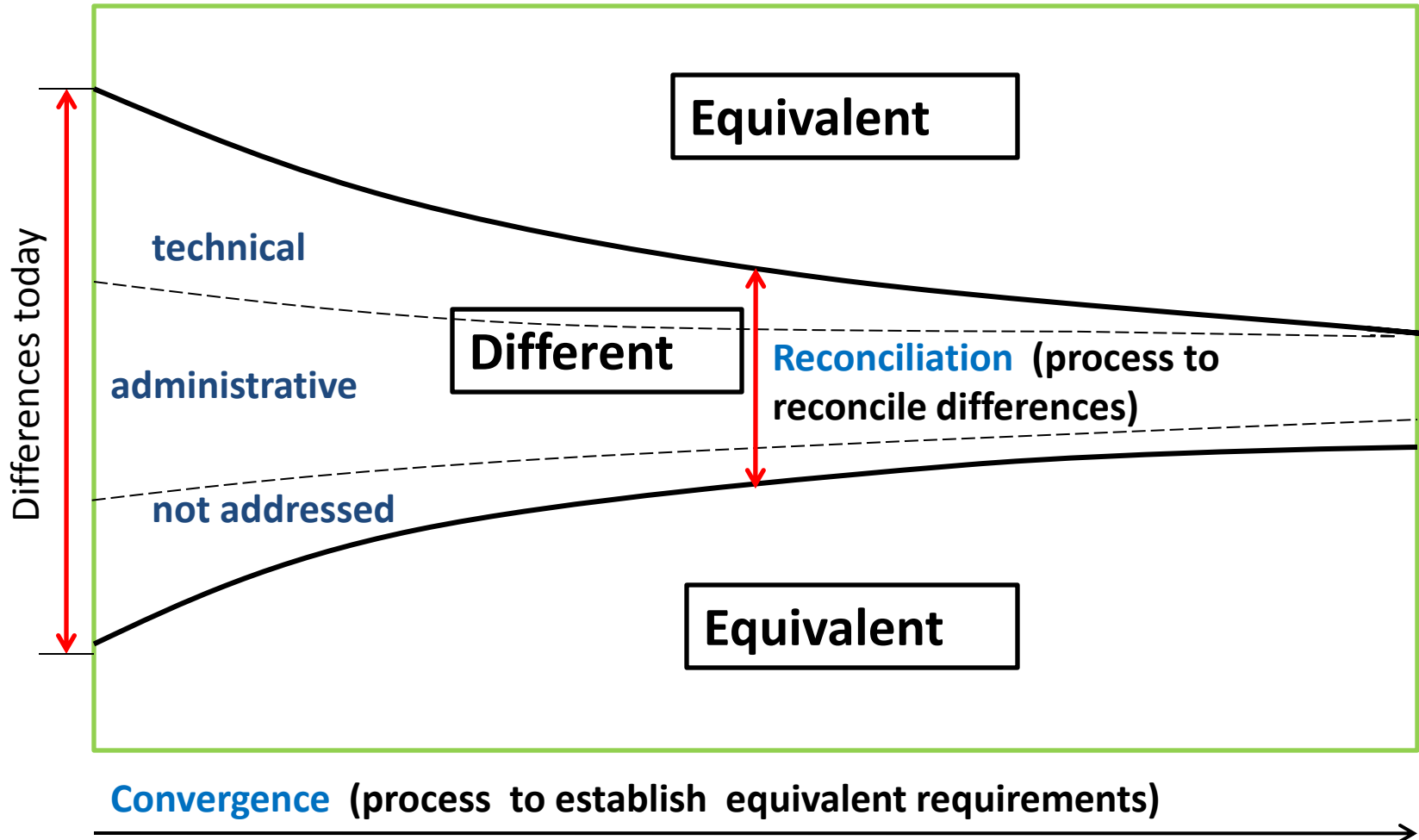
**Reconciliation** – the means to accept differences in code requirements by justifying their acceptability.

**Harmonisation** – is a framework or process by which different countries can achieve convergence and a reconciliation of differences with code requirements in order to ensure an acceptable level of quality and safety in nuclear power plants.

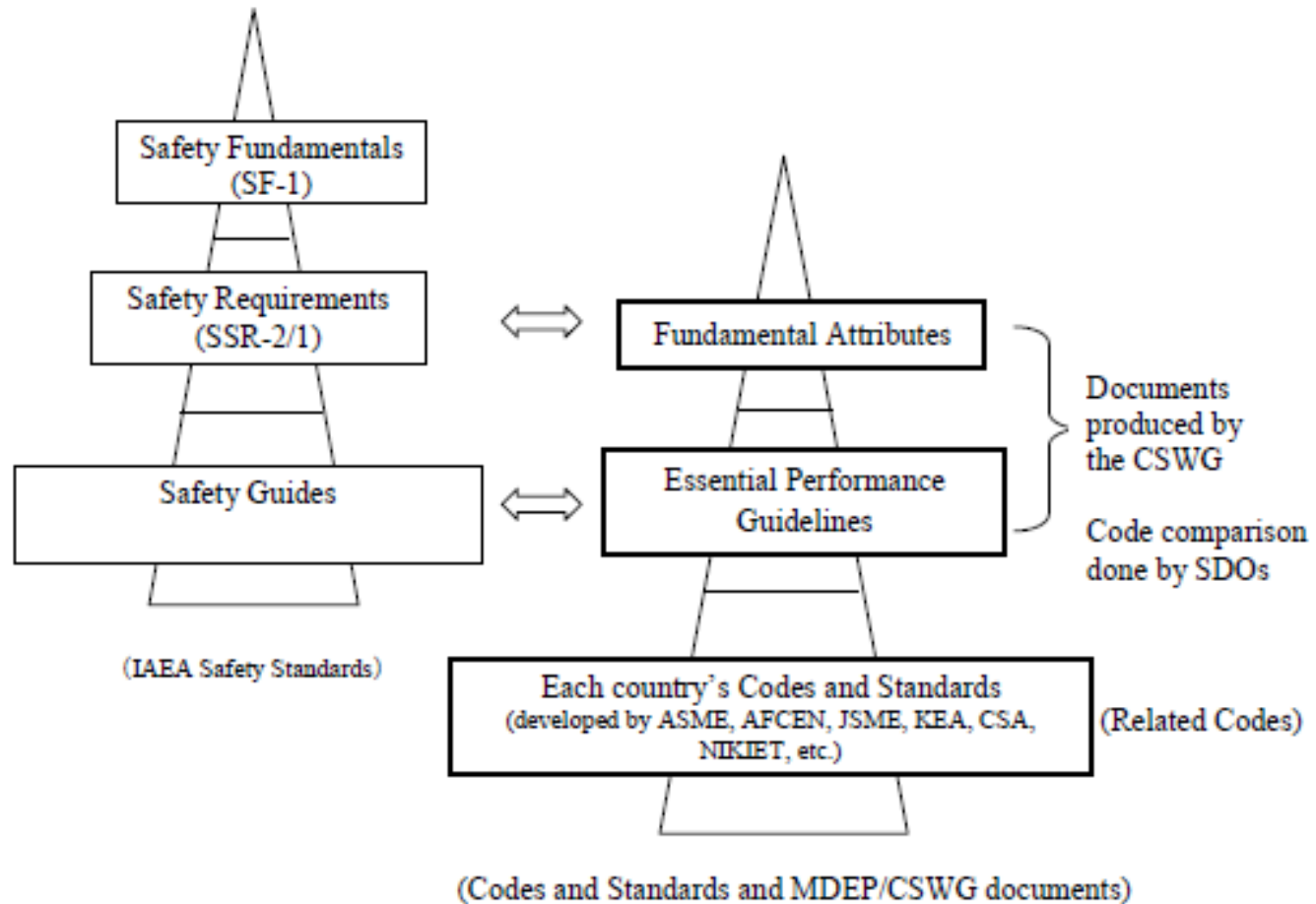
# General Comparison of codes

- The similarities and differences between each code and standard varied considerably amongst different codes and standard.
- These differences are due to the ***historical, cultural, social, industrial*** and ***regulatory*** differences of each country.

# Model for Harmonization of Codes



# Adapting an existing international framework





# Harmonization

Select topics with input from:

- Industry (CORDEL)
- Regulators (MDEP-CSWG)
- SDOs (SDO Convergence Board)

Convene group of experts from the industry to work within CORDEL MCSTF

Report current status of codes

propose harmonised rules

Define common Code Case

# MCSTF Project

- NDE Personnel Certification requirements
  - Code Comparison Report
  - Proposal
- Welding Qualification
- Non-linear Analysis Methods
  - Code Comparison Report
  - Benchmark
  - Best Practice
- Fatigue Life Analysis

# Summary

- Nuclear design codes were developed to be adapted to cultural and industrial approaches, social needs, and regulatory requirements
- A common framework for international collaboration has been created, with common definitions and approaches and a overarching approach to internationalization of code requirements
- High level comparison have been done, and main differences have been identified
- Harmonization should now focus on specific technical and administrative issues that have been identified as limiting factors in the licensing of new nuclear powerplants



[www.world-nuclear.org](http://www.world-nuclear.org)