Nuclear Safety Standards Committee

37th Meeting

1 – 4 July 2014

Agenda item 2.4

Design of Instrumentation and Control Systems for Nuclear Power Plants

A.Duchac, SAS-NSNI
DS 431 Outline

- Gives recommendations on the characteristics of I&C systems and on their design to meet the requirements established in **SSR 2/1: Design**
- Is a revision and combination of two previous Safety Guides NS-G-1.1 (SW), and NS-G-1.3 (I&C)
- It references and takes account of the Requirements for Management Systems GS-R-Part 3 and its supporting Guides GS-G-3.1, GS-G-3.5
- Reference to the IAEA computer security guide, NSS-17
- Provides criteria for avoiding negative safety effects from computer security features
Fukushima Implications

• Revised sections on accident monitoring and communications facilities
  • Inserted fundamental points concerning accident monitoring from IAEA publication *NP-T-3.16 on Accident Monitoring Systems for Nuclear Power Plants*, (8.20-8.35)
  • Brought terminology “Technical Support Centre” in line with that agreed for addendum to SSR 2/1 (8.43)
DS 431 (I&C) Current status

• December 2013 – Deadline for MS Comments
• March 2014 MS Comment resolution
• May 2014 IAEA Editor’s comments
• June 2014 5th NSGC meeting
• July 2014 37th NUSSC meeting
DS 431 MS comment distribution

- 386 comments received
DS 431 MS comment distribution

1. Introduction, 8
2. Management systems for I&C design, 103
3. I&C design basis, 14
4. Guidance for I&C architecture, 42
5. Classification, 14
6. General recommendations, 68
7. Specific design, 59
8. HMI, 27
9. SW, 21
Annexes, 6
Figures 1-3, 7
Definitions, 4
General, 13
DS 431 MS comments resolution

- Accepted 159 comments
- Rejected 227 comments
14 significant comments
  - Challenge to a fragile consensus
    - Management systems: 2.69, 2.71, 2.100, 2.167, 2.168
    - Architecture: 4.17, 4.18
    - General guidelines: 6.16, 6.190
    - Specific guidelines: 7.14, 7.22 e)
    - Software: 9.9
  - Approach
    - A small group established (FR, US, UK)
    - If non consensus – decision on NUSSC
  - Revised DS431 provided to NUSSC members
DS 431 NUSSC comment resolution

- 102 comments received (6 from NSGC)
- Discussion with UK, FR, USA
  - 58 accepted
  - 43 rejected
  - 1 pending (deletion of Annex III)
DS 431 NUSSC comment resolution

- Annex III “Areas where practices of Member States differ
  - Reliability determination for digital systems
  - Assessment of common cause vulnerabilities in safety systems
  - Diverse actuation systems

- Comment resolution table
  Item 2.4_37 NUSSC_Duchac_Copy of DS 431 37th NUSSC Comments resolution table_print.xls