



Use of Digital I&C Interim Staff Guidance in New Reactors

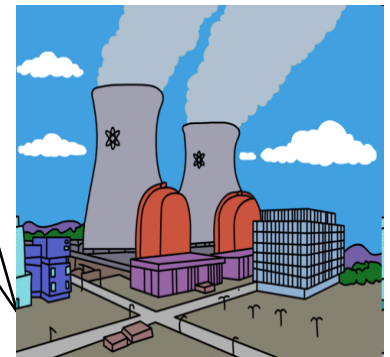
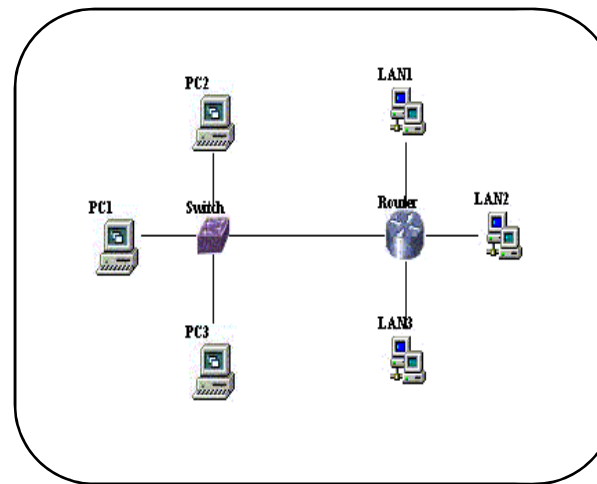
Public Workshop

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Agenda

- Introduction
- Background
- Use of Interim Staff Guidance (ISG) for each design center
 - ABWR, AP1000, ESBWR, US-APWR, U.S. EPR
- Observations
- Conclusion



Introduction

- NRO has been actively participating in the Task Working Groups 1 – 5
- ISGs were created to respond to the industries need for additional guidance in the digital I&C area

Background

I&C Platforms for New Reactors - General

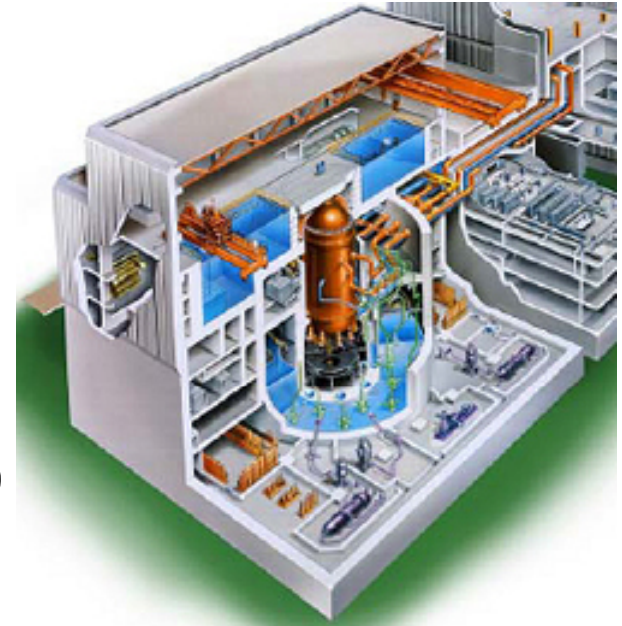
Reactor Design	RPS	ESFAS	DAS	Control Systems
ABWR	FPGA	Common Q	Ovation	Ovation and TOSMAP
AP1000 (Passive)	Common Q		Digital/FPGA	Ovation
ESBWR (Passive)	NUMAC	Triconex	Mark VIe	Mark VIe
US-APWR	MELTAC		Analog	MELTAC
U.S. EPR	Teleperm XS		Digital	Digital

Background

- Finality of certified designs – ABWR, CE System 80+, AP600, and AP1000
- Incorporation by reference
- Design Acceptance Criteria
 - SECY 92-053
- Inspections, Tests, Analyses and Acceptance Criteria (ITAAC)
- Staff verification

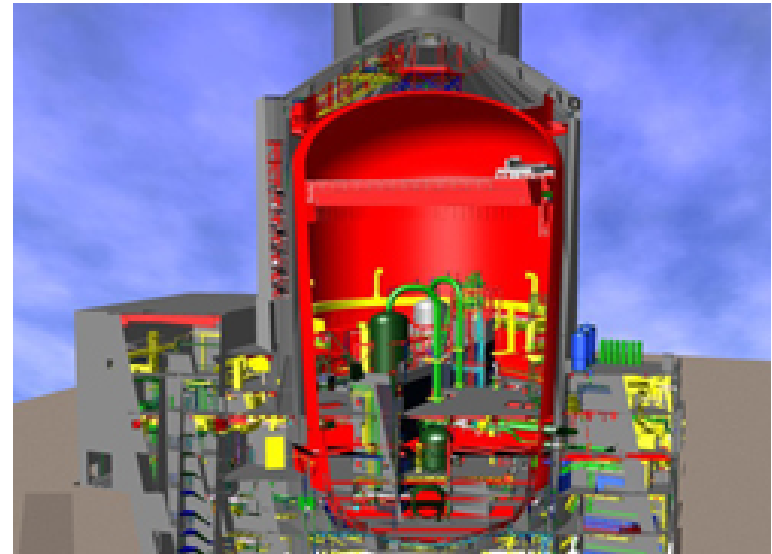
Advanced Boiling-Water Reactor (ABWR)

- 1 COLA: South Texas 3/4
 - Certified ABWR design with some departures
 - Phase 1 (Preliminary Safety Evaluation Report with Open Items) review underway for I&C
- Staff recently issued a Request for Additional Information (RAI)
“... The NRC Staff requests that STPNOC provide evaluation of I&C departures against the ISG documents or justify an alternative.”



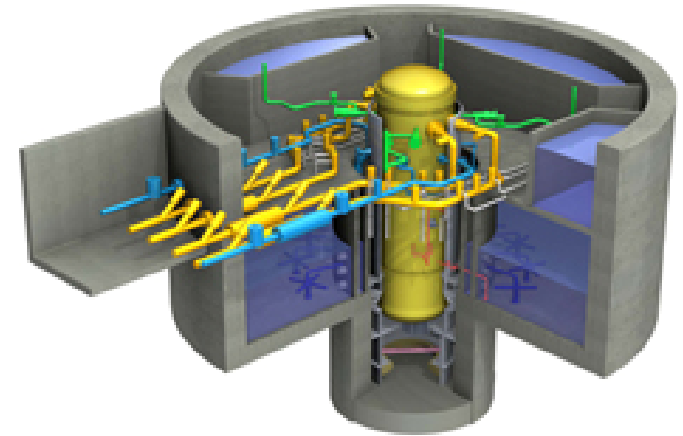
Advanced Passive 1000 (AP1000)

- Amendment (Revision 17) to certified AP1000 design under review
 - Phase 2 near completion for I&C
- 6 COLAs under review
 - Incorporates the design certification by reference
- Staff has been using ISGs as reference tools during the review of the amendment



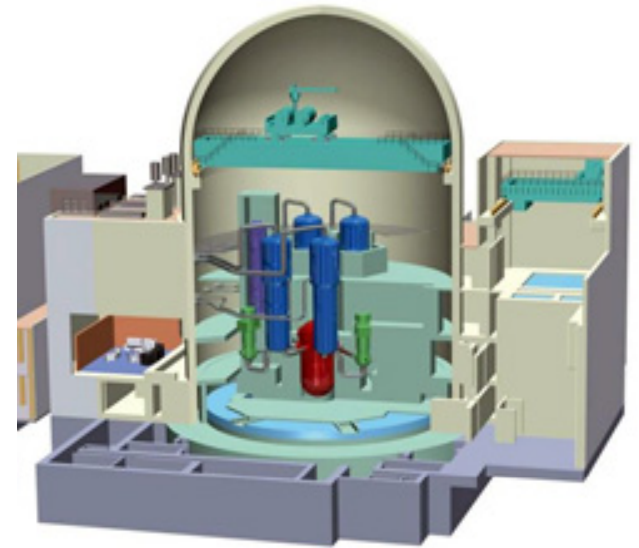
Enhanced Simplified Boiling-Water Reactor (ESBWR)

- ESBWR design certification under review
 - Phase 4 (Safety Evaluation Report without Open Items) for Chapter 7
- 2 COLAs under review: North Anna and Fermi
 - Incorporates the design certification by reference
- Staff issued RAIs on ISGs
- ESBWR has no known conflict with ISGs



U.S. Advanced Pressurized Water Reactor (US-APWR)

- US-APWR design certification under review
- 1 COLA: Comanche Peak
 - Incorporates the design certification by reference
 - Phase 1 review underway for I&C
- Staff is currently using the ISGs to evaluate the design certification (RAI issued)
- US-APWR conforms to ISGs with some deviations (e.g., engineering station)



U.S. Evolutionary Power Reactor (U.S. EPR)

- U.S. EPR design certification under review
 - Phase 2 underway
- 4 COLAs:
 - Incorporates the design certification or R-COLA by reference
- Staff is using the ISGs to evaluate the design certification (RAIs issued)
- AREVA conforms to ISGs with some deviations



Observations

- Deviations from ISGs tend to require additional time and resources for staff review and approval
- Deviations from ISGs tend to originate from the differences between the ISGs and the applicant's use of the already-built systems
- Sufficient bases and adequate documentation for deviations (i.e., alternative to the ISGs) will enhance licensing reviews

Summary

- The staff uses the ISGs, and they are deemed useful in new reactor design reviews
- ISGs provide one acceptable method for demonstrating conformance to the associated requirement, and alternatives to the ISGs are allowed
- New reactor vendors/applicants have generally provided positive feedback to the staff on the usefulness of the ISGs
- ISGs contribute to reducing licensing uncertainty through early identification, discussion and resolution of some of the key design issues
- NRO staff continues to work closely with internal and external stakeholders for efficient and effective licensing reviews and verification of DAC/ITAAC