

# Regulatory Guide 1.231



***Acceptance of Commercial-Grade  
Design and Analysis Computer  
Programs for Nuclear Power Plants***

**June 23, 2016  
NRC Vendor Workshop**

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Office of New Reactors

# Agenda

- ▶ Applicability
- ▶ Regulatory framework
- ▶ Requirements & Guidance
- ▶ Regulatory Guide 1.231 status
- ▶ Revision 1 of EPRI 1025243
- ▶ Implementation



# Applicability

- ▶ Regulatory Guide 1.231 - limited scope:
  - Safety-related use of Commercial Design & Analysis Computer Programs (CP)
- ▶ EPRI 1025243 methodology is broader:
  - Full acceptance process
  - Many safety classifications
  - Focus is Design & Analysis CP
  - Examples of other CP



# Design and Analysis Software

- ▶ Design of structures, systems and components
- ▶ Finite element analysis
- ▶ Piping analysis
- ▶ Seismic analysis
- ▶ Thermal and flow analysis
- ▶ Nuclear physics
- ▶ Electrical system analysis
- ▶ Accident analysis





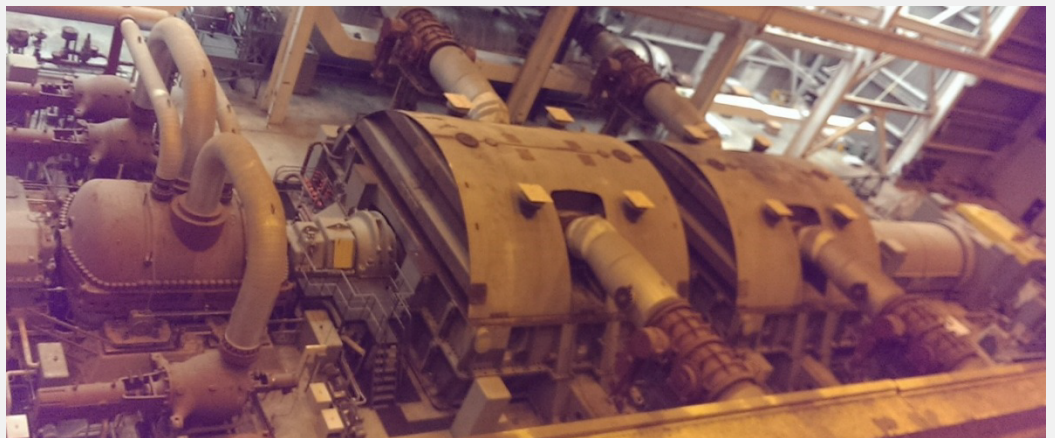
# Regulatory Framework

- ▶ *Basic component*
  - Affects safety function
  - Structures, systems, and components (SSC)
  - Part of an SSC
  - Includes safety-related design and analysis
- ▶ *Commercial grade item (CGI)*
  - Affects safety function
- ▶ *Dedication (CGD)*



# Requirements

- ▶ Appendix B to Part 50 (QA)
  - Provisions of specific QA program
- ▶ Part 21 (reporting and dedication)
- ▶ Plant licensing basis (licensee)
- ▶ Purchase order requirements (vendor)



# Programmatic Guidance

- ▶ Regulatory Guide 1.28, Revision 4  
(QA for design and construction)
- ▶ Regulatory Guide 1.33, Revision 3  
(QA for operations)
- ▶ NUREG-0800, Section 17.5  
“Standard Review Plan”



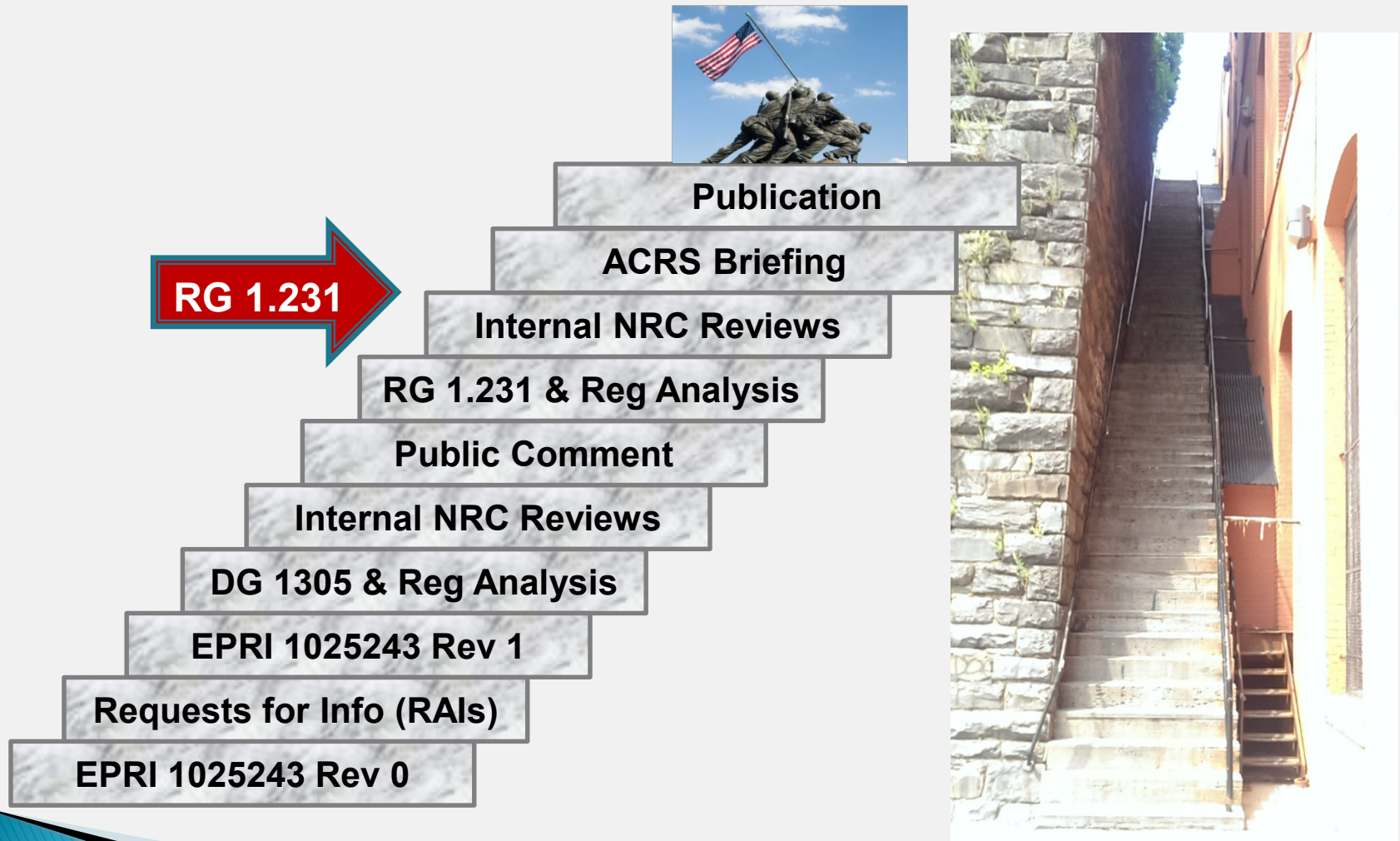
# Detailed Guidance

- ▶ Dedication guidance:
  - Generic Letter 89-02 (EPRI NP-5652)
  - Draft Reg Guide 1292 (EPRI 3002002982)
  - Subpart 2.14 of ASME NQA-1-2008/09a
- ▶ Software specific:
  - Subpart 2.7 of ASME NQA-1-2008/09a
  - Reg Guide 1.231 (EPRI 1025243, Rev 1)

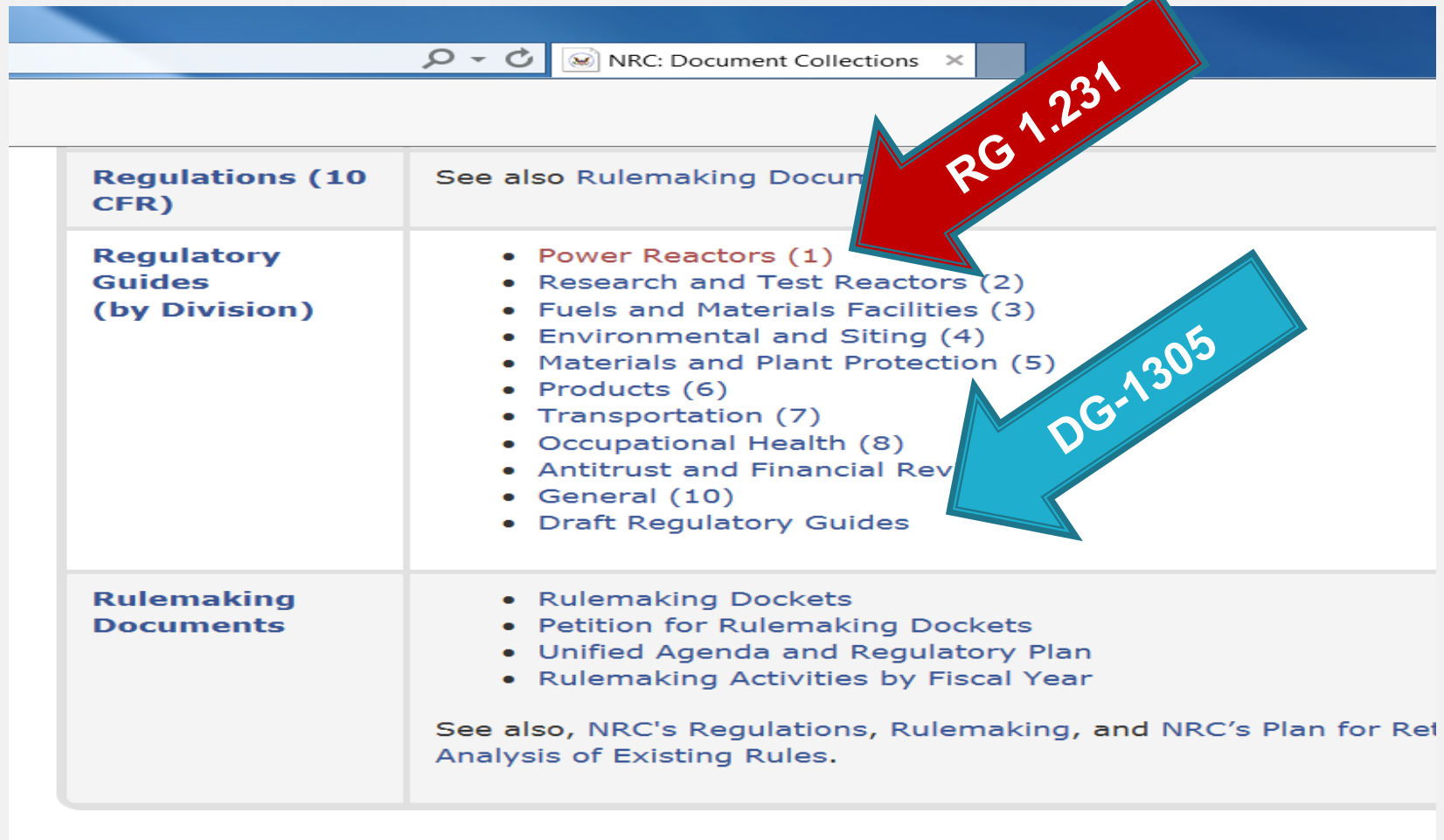




# Regulatory Guide Process



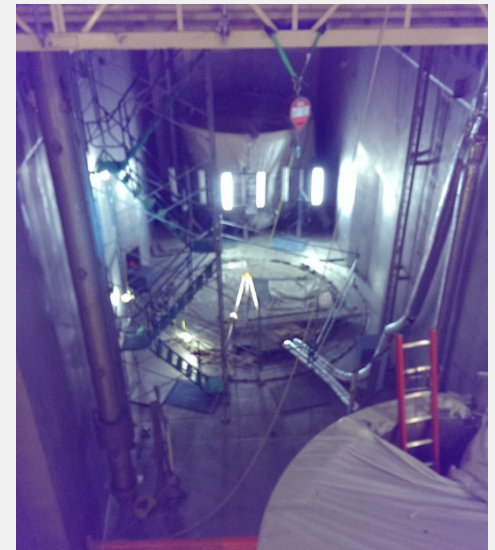
# Locating RG 1.231



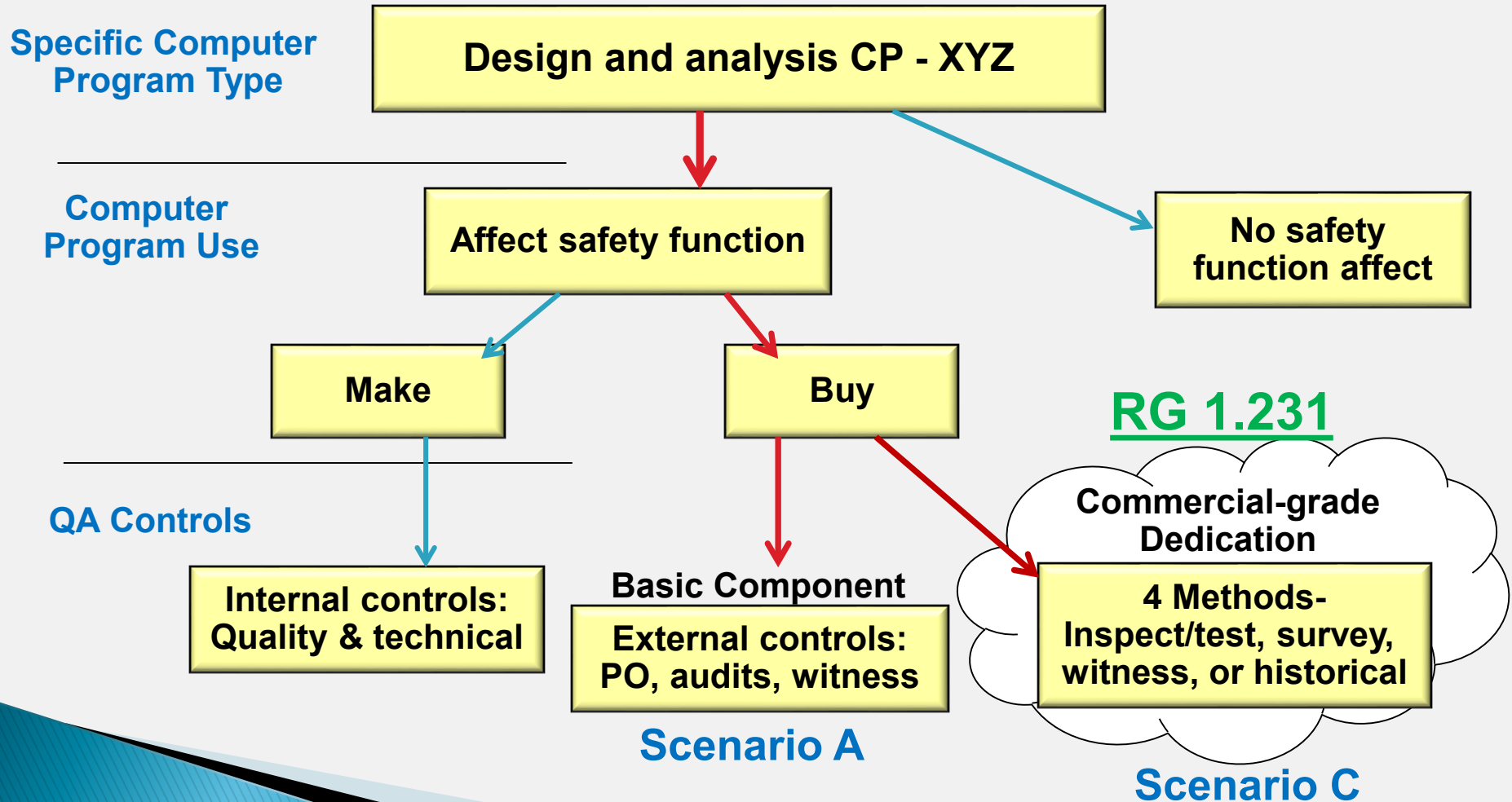
NRC: Document Collections	
<b>Regulations (10 CFR)</b>	See also Rulemaking Documents
<b>Regulatory Guides (by Division)</b>	<ul style="list-style-type: none"><li>• <b>Power Reactors (1)</b></li><li>• Research and Test Reactors (2)</li><li>• Fuels and Materials Facilities (3)</li><li>• Environmental and Siting (4)</li><li>• Materials and Plant Protection (5)</li><li>• Products (6)</li><li>• Transportation (7)</li><li>• Occupational Health (8)</li><li>• Antitrust and Financial Review (9)</li><li>• General (10)</li><li>• Draft Regulatory Guides</li></ul>
<b>Rulemaking Documents</b>	<ul style="list-style-type: none"><li>• Rulemaking Dockets</li><li>• Petition for Rulemaking Dockets</li><li>• Unified Agenda and Regulatory Plan</li><li>• Rulemaking Activities by Fiscal Year</li></ul> <p>See also, NRC's Regulations, Rulemaking, and NRC's Plan for Retrospective Analysis of Existing Rules.</p>

# Regulatory Guide 1.231

- ▶ Revision 1 of EPRI 1025243 meets:
  - Appendix B to 10 CFR Part 50 requirements, and
  - 10 CFR Part 21 requirements for
  - Dedication of design and analysis CP
- ▶ Regulatory positions:
  - Non-process computer programs only
  - Design and analysis applications only
  - Safety-related classification only

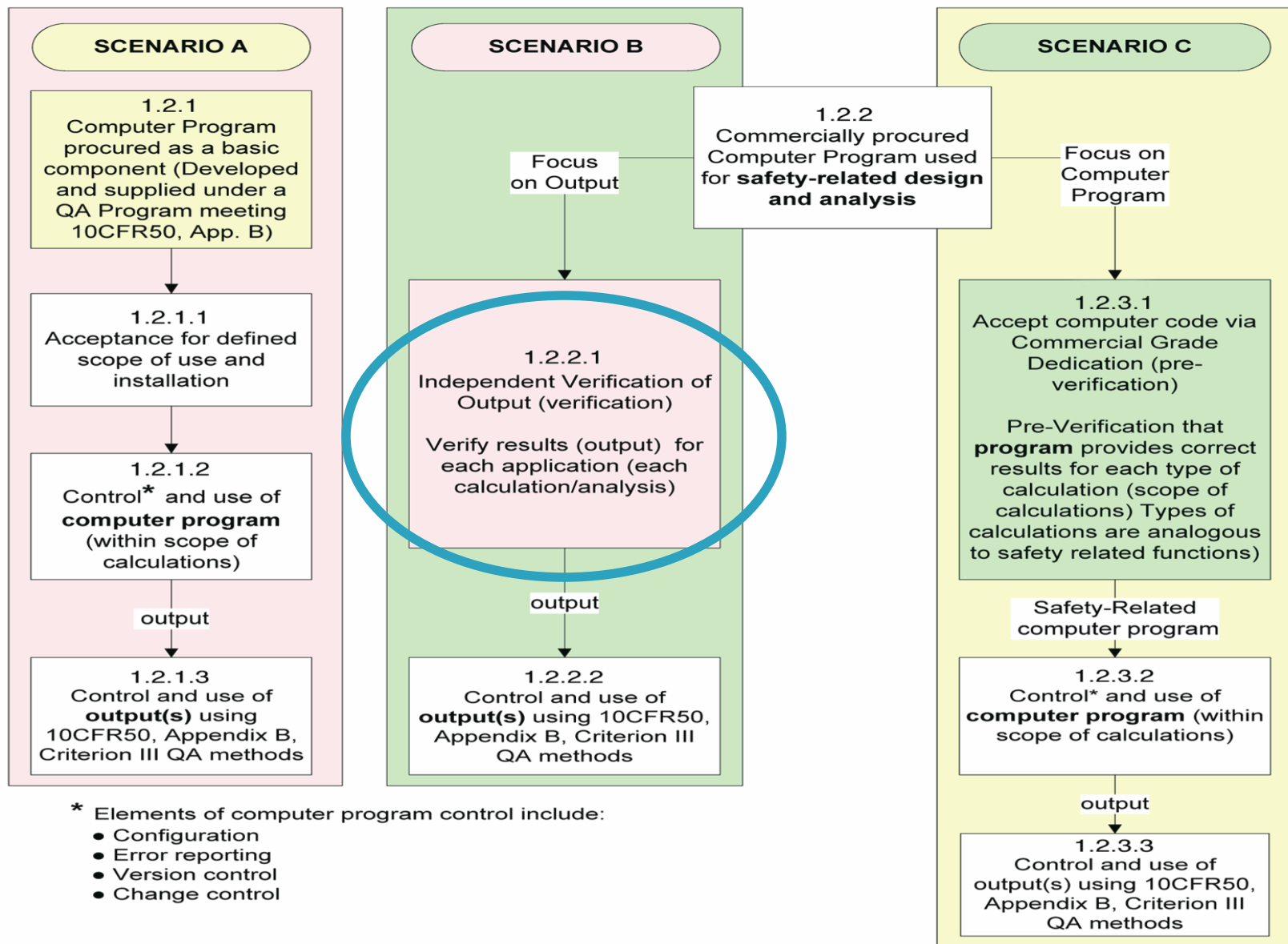


# RG 1.231 Focus





# EPRI 1025243 Methodology



# Implementation

- ▶ Focus of affect on safety function
- ▶ Graded approach
- ▶ Leverage existing control processes
- ▶ Establish and follow process
- ▶ Consider data, computer program and operating environment
- ▶ Configuration control
- ▶ Error control and *Defect* reporting
- ▶ Document-Document-Document

# On to the Questions !



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