

# NRC Perspectives on Software QA Implementation

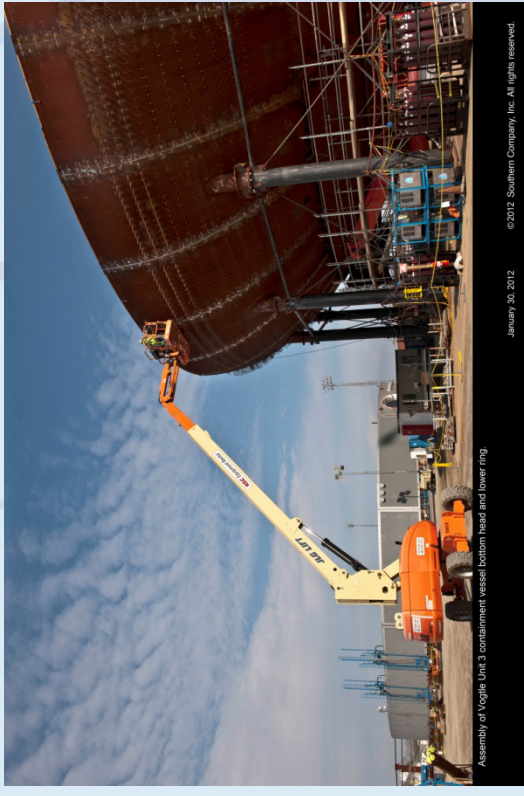
**June 28, 2012**  
**Vendor Workshop**

**George Lipscomb**  
Electrical Vendor Branch  
Division of Construction Inspection  
& Operational Programs  
Office of New Reactors

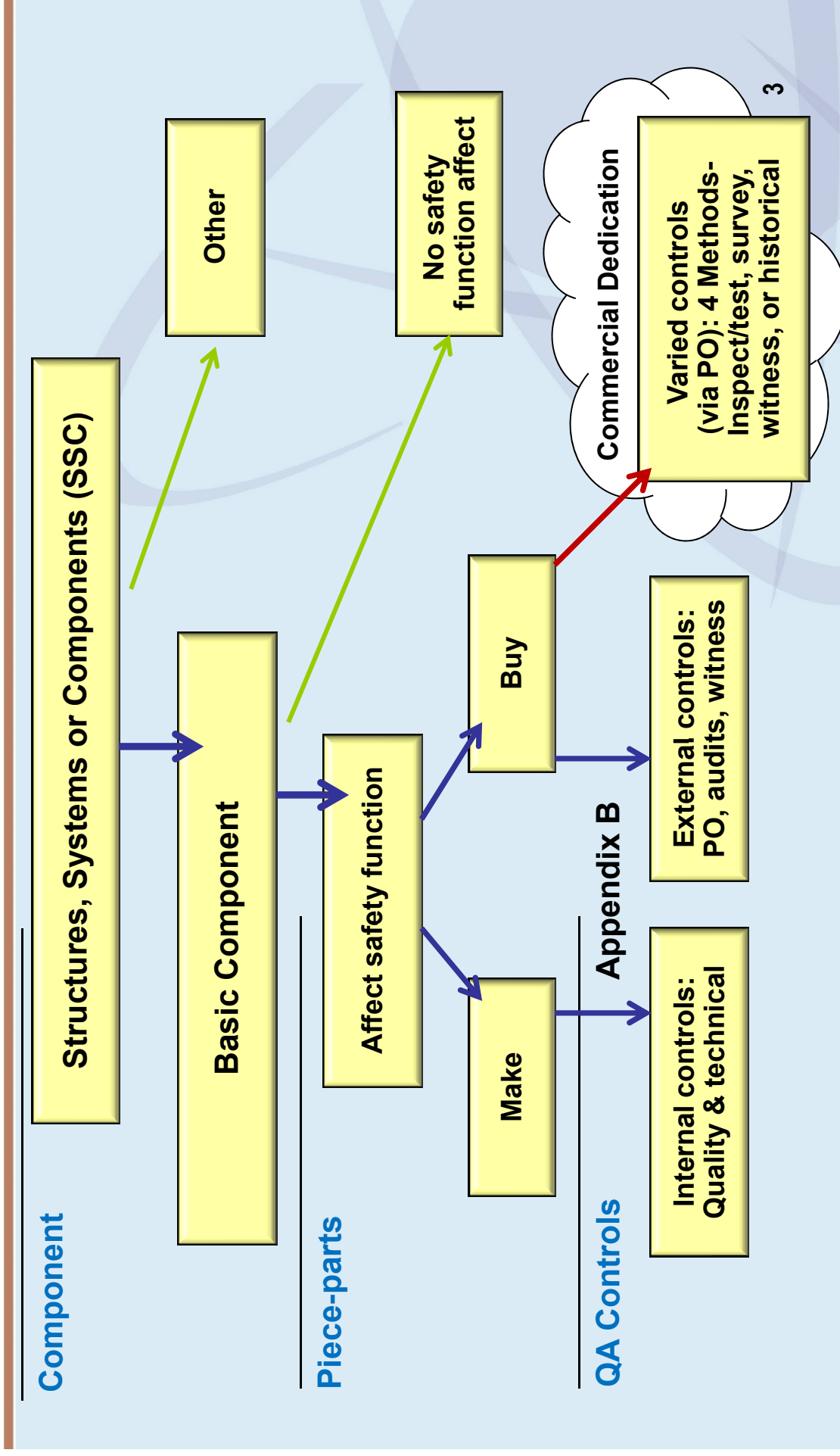


# Agenda

- Regulatory framework
- Meeting QA requirements
- Software dedication and controls
- Vendor inspections and findings
- Important points



# Component Example



# Meeting QA Requirements

- Must meet Appendix B to 10 CFR Part 50
- ASME NQA-1-2008 with 2009 Addenda
  - One option available ([www.asme.org](http://www.asme.org))
  - Endorsed by Regulatory Guide 1.28 Rev 4 for design and construction (as modified)
  - Subpart 2.7 specific to software
- Software: evaluate and apply appropriate QA controls



# Software Dedication and Control

- Dedication is a process
- Software: the same dedication process
  - Defined dedication process
  - Targeted dedication plan
    - ✓ Identify safety function
    - ✓ Identify Critical Characteristics
    - ✓ Verify acceptability (4 methods)
  - Proper implementation and documentation
- Requires rigor

# Meeting Dedication Requirements

- EPRI NP-5652
  - One option available ([www.epri.com](http://www.epri.com))
  - Conditionally endorsed by GL 89-02
- ASME NQA-1-2008 with 2009 Addenda
  - One option available ([www.asme.org](http://www.asme.org))
  - Subpart 2.7, Section 302 “Otherwise Acquired Software”
  - Subpart 2.14 specific to dedication

# Software Dedication Expectations

- Technically oriented dedication plan
- Providing “reasonable assurance”
  - Multiple dedication methods available
- Special Tests and Inspections (Method 1)
  - Hardware & operating system pairing
  - Installation vs. execution
  - Range of use
- Configuration control
  - patches & updates

# Software Dedication

## Expectations

- Commercial Grade Survey (Method 2)
  - To Verify
    - Lifecycles
    - Requirements traceability
    - Layers of review / testing
    - Users manual updates
    - Error (“bug”) control / reporting
- Primarily controlled via purchase order
- Engineering / Technical Specialist participation in surveys

# Recent Inspection Findings

Most recent nine inspections: 40 findings/URIs



<http://www.nrc.gov/reactors/new-reactors/oversight/quality-assurance/vendor-insp.html>

# Software Inspection Findings

- Process failures
  - Software requirements
    - No review & approvals of documents
    - No traceability to test plan
  - Software CGD
    - Unsuitable comparison models for validation
    - No critical characteristics
    - No acceptance methods
    - No evaluation of error notices

# Software Inspection Findings

- Implementation failures
  - Inappropriate CGD technical evaluation
  - Test plan missing acceptance criteria
  - Missing requirements in system specification
  - Verification and validation (V&V) inadequate

# Important Points

- Manage software QA control processes
- Evaluate software's impact on basic component
- Increased emphasis on dedication of software
- Important to evaluate software deviations & report defects
- Document all dedication activities



# Thank you!!



Aerial view of Vogtle 3 and 4 construction site – Unit 3 on left, Unit 4 on right

March 29, 2012

©2012 Southern Company, Inc. All rights reserved.