



POWER NUCLEAR

Engineering
the Future of Nuclear

Application of the requirements of
10CFR, Part 21 for Dedication of
Specific Modules of the EMTP-RV
Commercial Grade Software

The ZACHRY logo is displayed in a bold, green, sans-serif font. It is positioned on a white diagonal banner that cuts across the bottom right corner of the image. The background of the slide is a photograph of a complex industrial control room or equipment room, featuring numerous grey metal cabinets, a dense network of cables, and various control panels. A large yellow and orange diagonal graphic element is overlaid on the top left and center of the image.

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Application of the requirements of
10CFR, Part 21
for
Dedication of Specific Modules of the EMTP-RV
Commercial Grade Software
for the
US Nuclear Power Industry

Agenda:

- Definitions
- Safety Related Determination
- Allowable Scenarios for Safety Related Software Procurement
- Functional Classification Considerations
- Generic Technical Evaluation and Acceptance Process

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Definitions

safety- related

A plant structure, system, component, part or item used in a nuclear power plant that is relied upon during or following design basis accidents to assure:

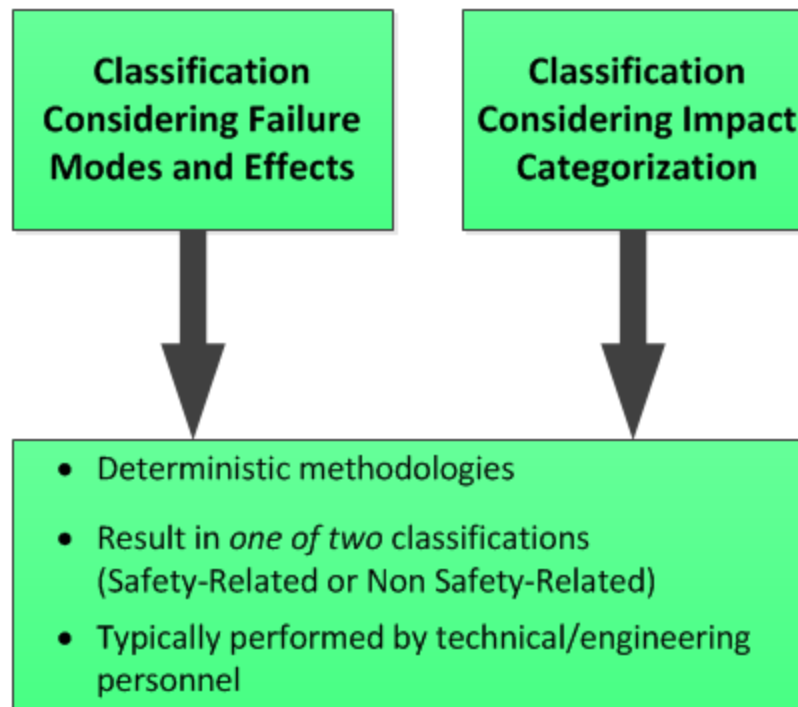
1. The integrity of the reactor coolant pressure boundary,
2. The capability to shut down the reactor and maintain it in a safe shutdown condition, or
3. The capability to prevent or mitigate the consequences of accidents which could result in potential offsite radiation exposures comparable to those referred to in 10CFR Part 100.11.

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Safety Related Determination

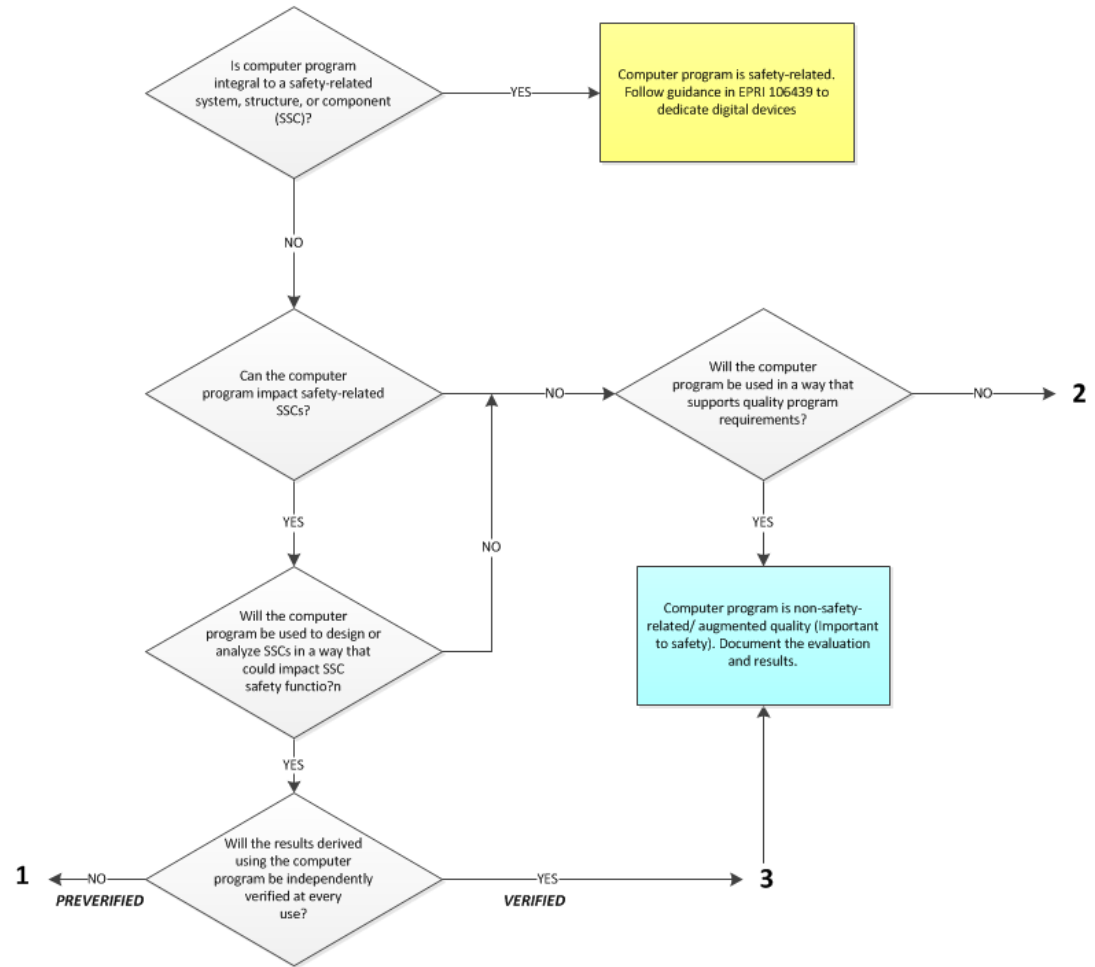
Functional Safety Classification



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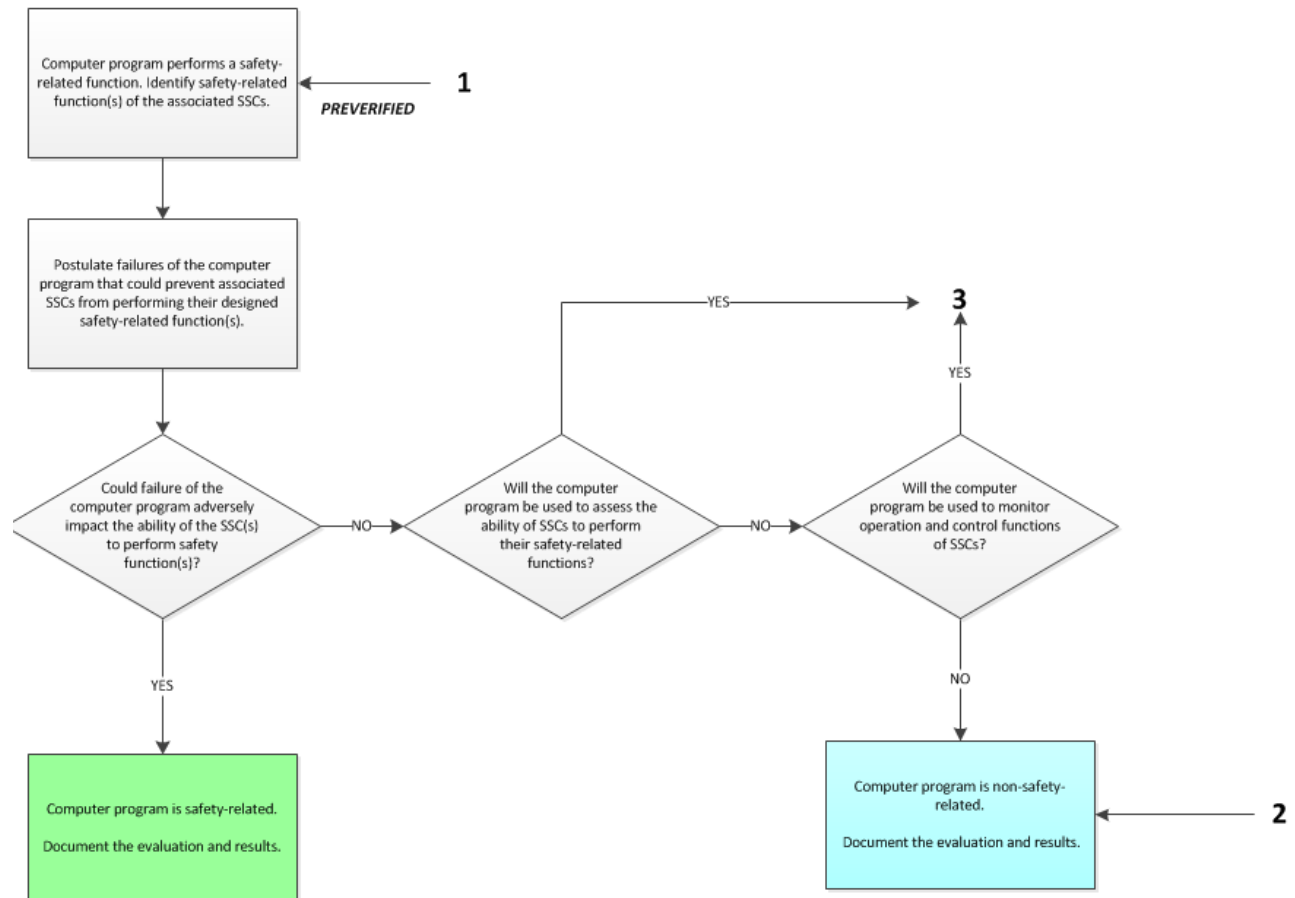
Safety Related Determination Continued



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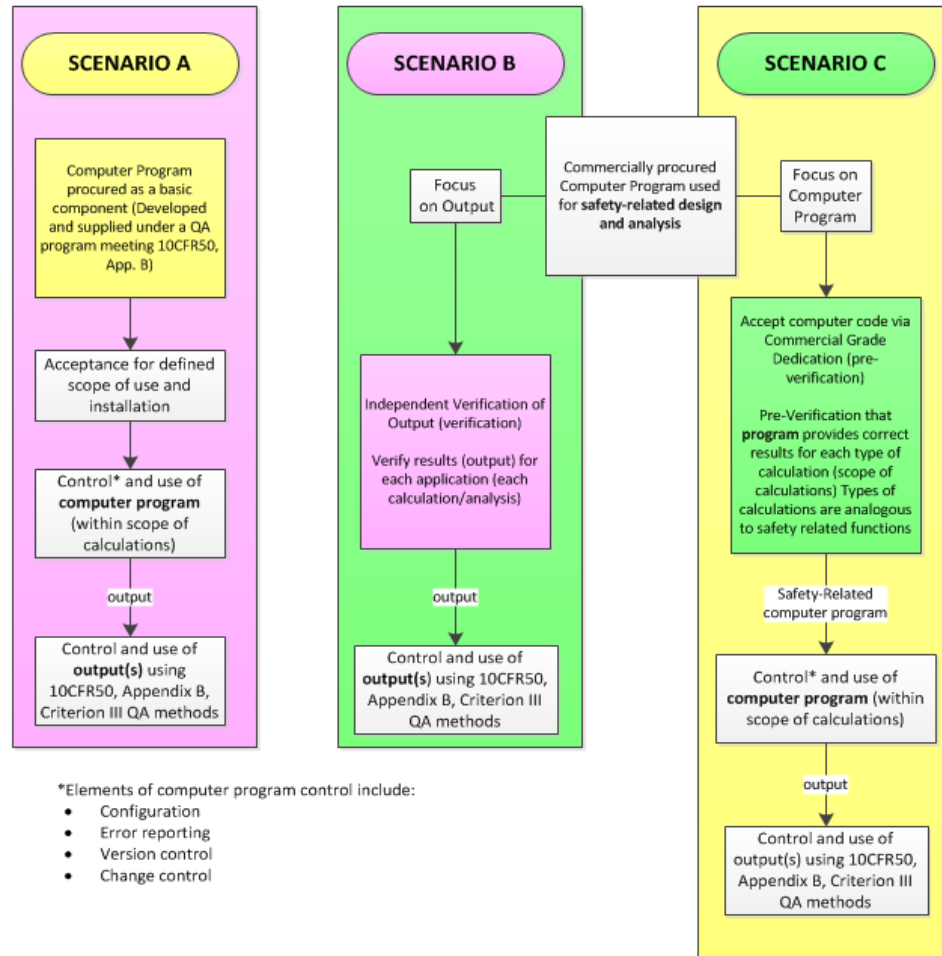
Safety Related Determination Continued



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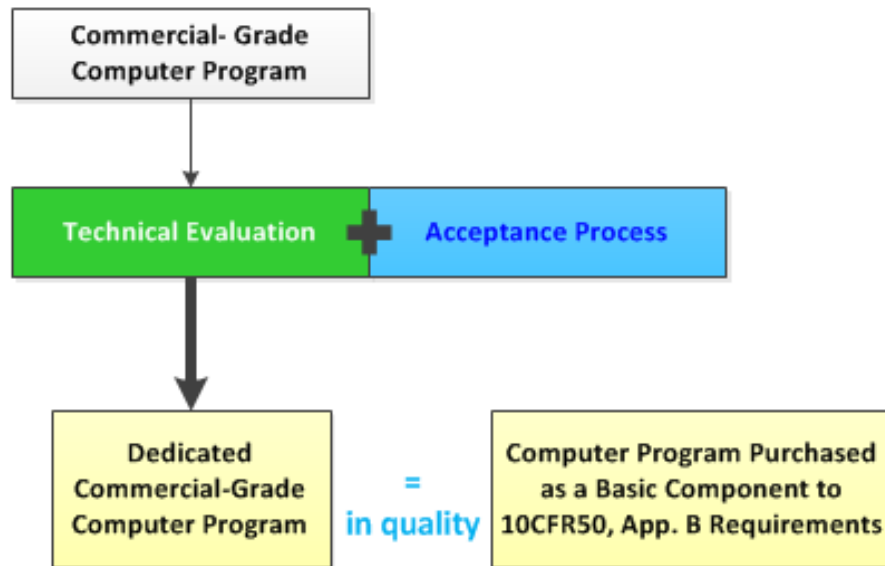
3 Scenarios for Software Procurement for Use in Safety Related Design and Analysis Applications



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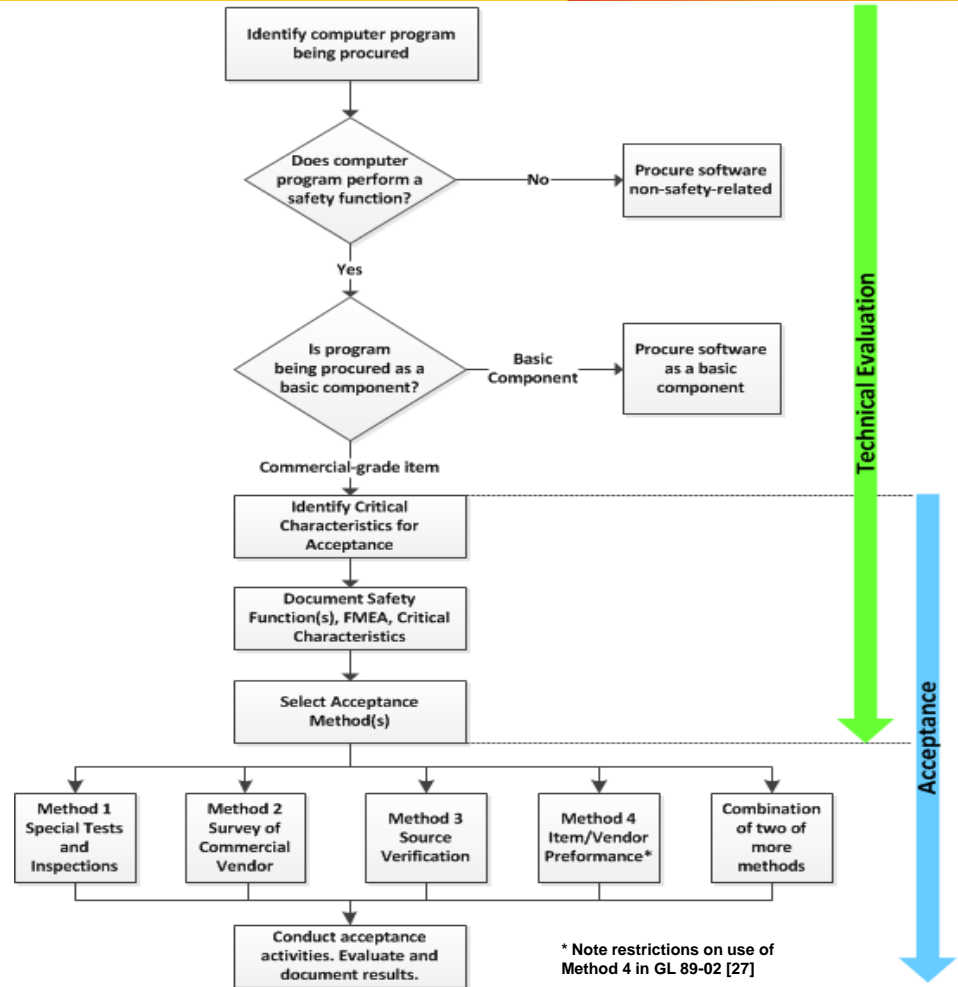
Generic Technical Evaluation and Acceptance Process



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Generic Process for Commercial Dedication Process Continued



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Critical Characteristic Selection:

Critical Characteristics are defined in 10CFR21 as:

Those important design, material and performance characteristics of a commercial grade item that once verified, will provide reasonable assurance that the item will perform its intended safety function.

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Critical Characteristic Selection Continued

Identifying critical characteristic is an essential step in the dedication process. Critical characteristics identified during the commercial Dedication Plan are verified during the acceptance process to provide reasonable assurance that the computer program being accepted is capable of performing its intended safety related function as documented in the Commercial Dedication Report.

Common Failure Mechanisms and Associated Critical Characteristics

Postulated Failure	Description
Conceptual Error	Errors resulting when the computer program is applied outside its intended use or when the computer program is syntactically correct, but the programmer or designer intended it to do something else.
Arithmetic Error	Errors such as division by zero, stack over/underflow, and loss of precision resulting from incorrect programmatic calculations.
Interface Errors	Errors generated by or through incorrect interfacing of the computer program with other programs, hardware, or operating systems.

Commercial Dedication Documentation

Commercial Dedication Plan and Commercial Dedication Report

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Commercial Dedication Documentation Continued

- Commercial Dedication Plan Minimum Content:
 - Description of Item and Services
 - Safety Function Statement
 - Confirmation of Commercial Grade item/Service Criteria
 - Identification of Critical Characteristics, Acceptance method and Acceptance criteria
 - Qualification Requirement
 - Supplier Purchase Order Requirements

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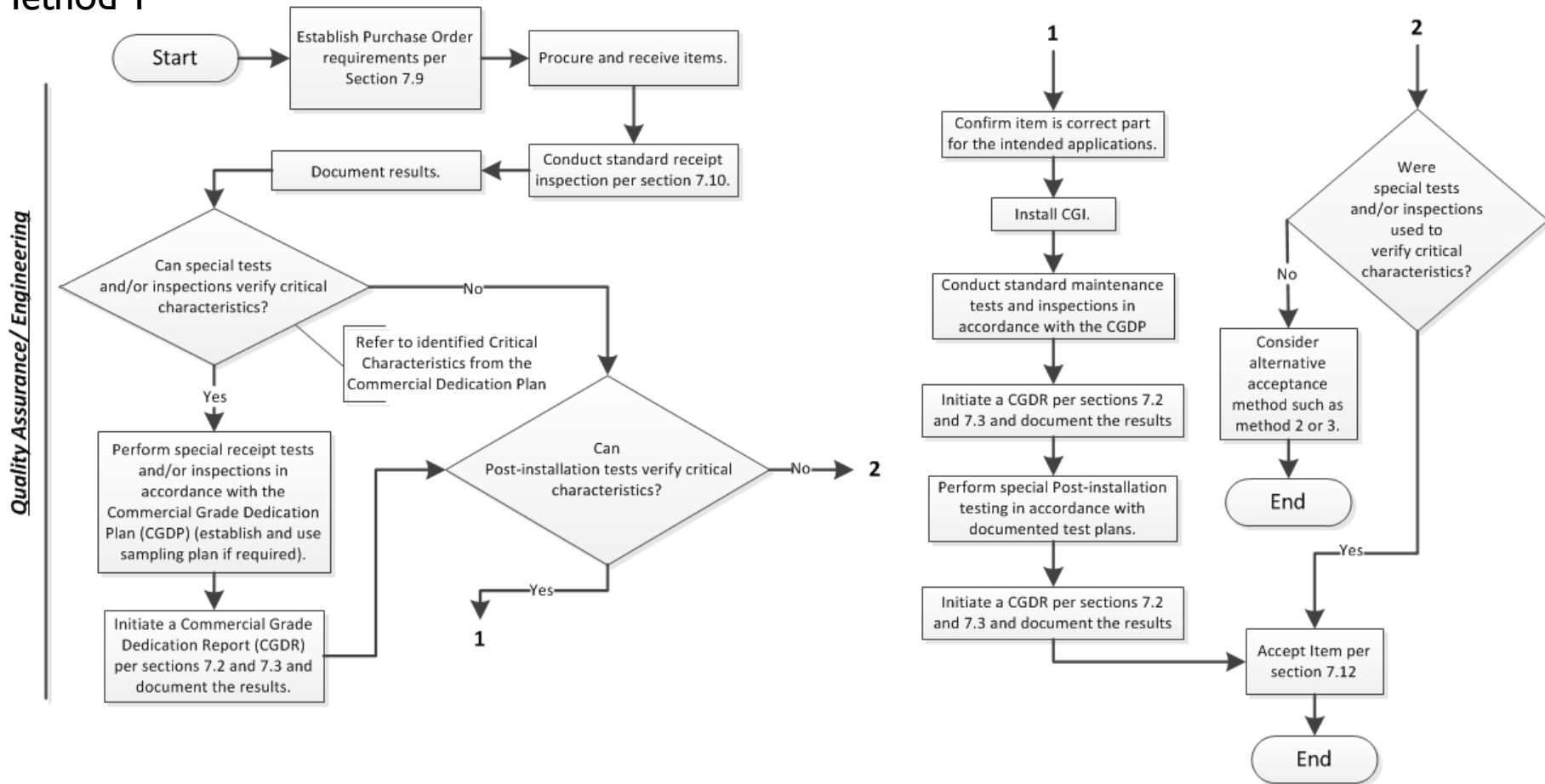
Commercial Dedication Documentation Continued

- Commercial Dedication Report Minimum Content:
 - Brief Synopsis of Results
 - Detains Results of All:
 - Inspection
 - Tests
 - Source Verifications
 - Objective Evidence of all Results that were within Acceptable Limits and Statement of Same.
 - Objective Evidence of all Results that were not within Acceptable Limits and what was done to address and or qualify the discrepancies.
 - Documentation of any Completed Qualifications.

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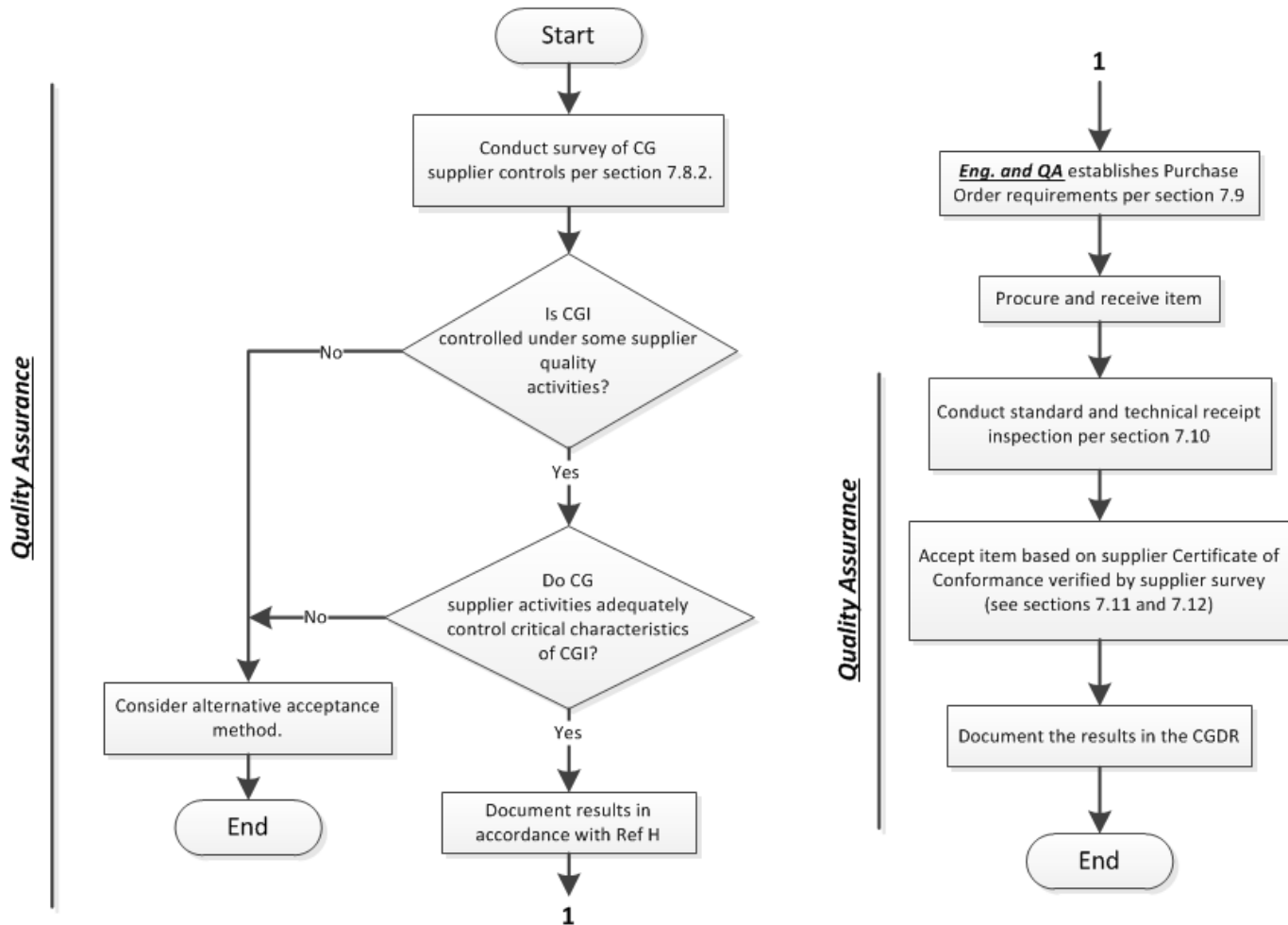
Method 1



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Method 2

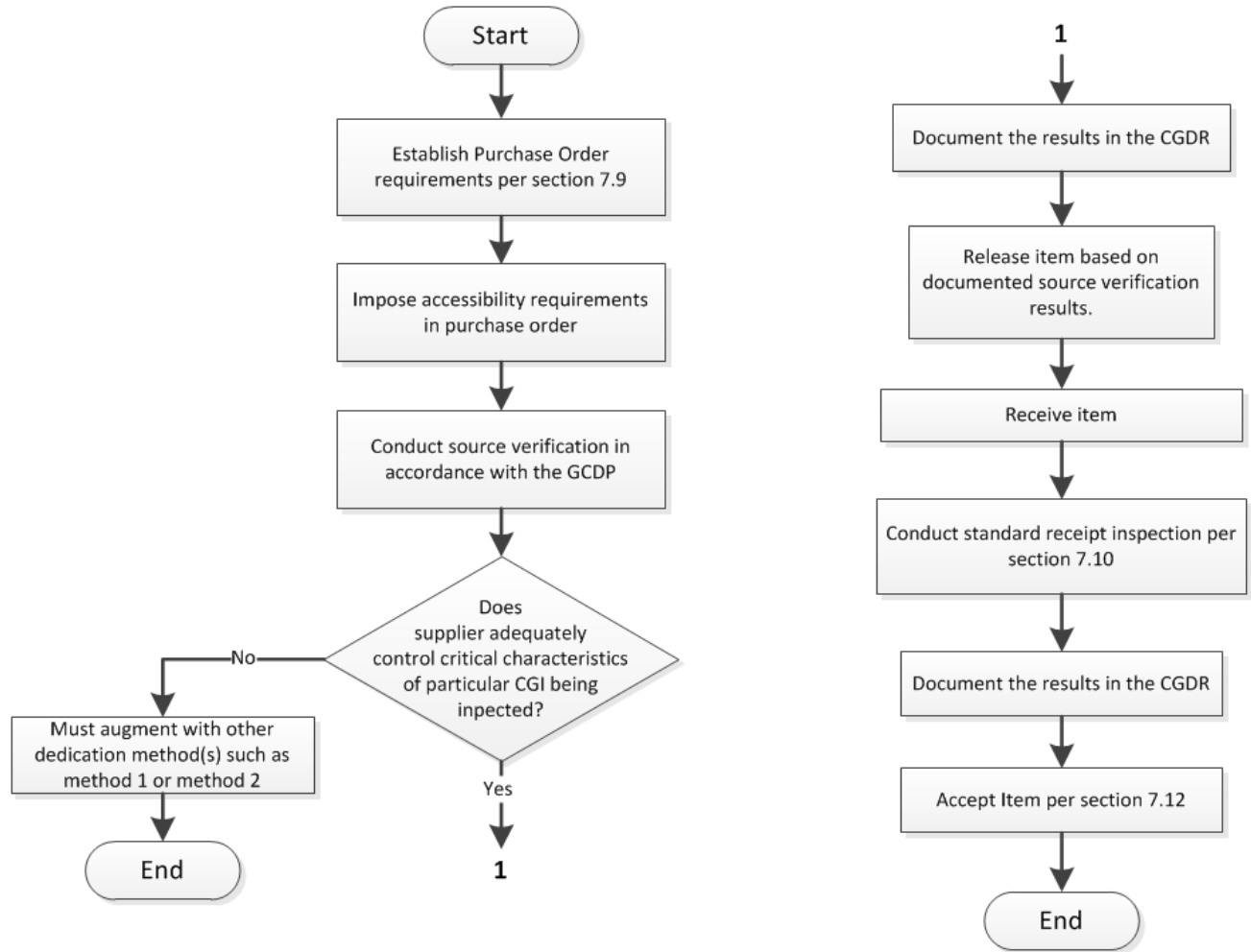


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Method 3

Quality Assurance/ Engineering



Questions ?

Thank You

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