EPRI Guidance to Facilitate Procurement and Use of Spare and Replacement Items

EPRI

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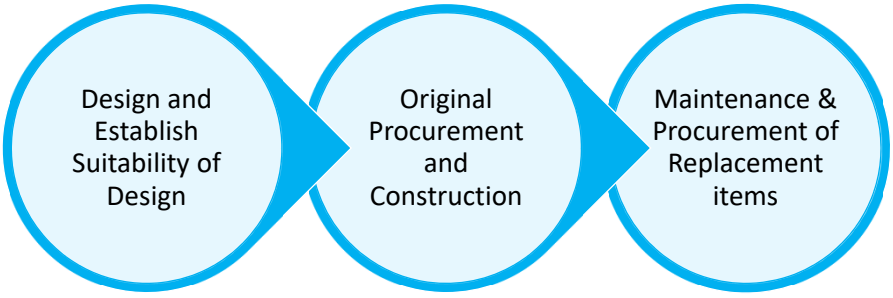
Procurement Lifecycle



Replacements must meet applicable design requirements

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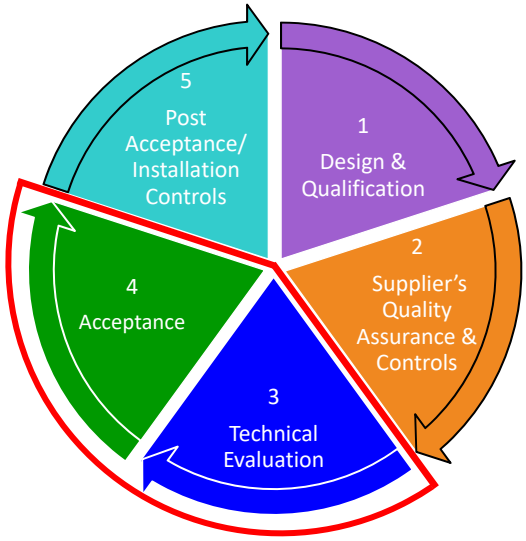
Terminology – An important foundation



(1) Design & establish suitability of design including equipment ***qualification*** (seismic, radiation, EMI/RFI, chemical spray, etc.)

(2) Supplier's quality controls – Determine the supplier's capabilities and role in ensuring items meet design requirements

(3) Technical evaluation – Translate design and quality requirements into contract or purchase order requirements and ensure control of design.

(4) Acceptance – Establish acceptance criteria and verify that items meet design requirements

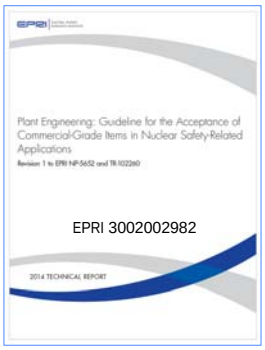
(5) Post acceptance / installation controls provide continued assurance the item can perform its intended function(s)

(6) *Dedication* is an acceptance process – originally intended to address situations where acceptance criteria is unavailable (and is therefore determined based on function) Design & qualification must be complete prior to dedication.

Commercial Grade Dedication

Acceptance Methodology for items not controlled under a "nuclear" QA program for safety-related use

CGD Basics course on EPRI U



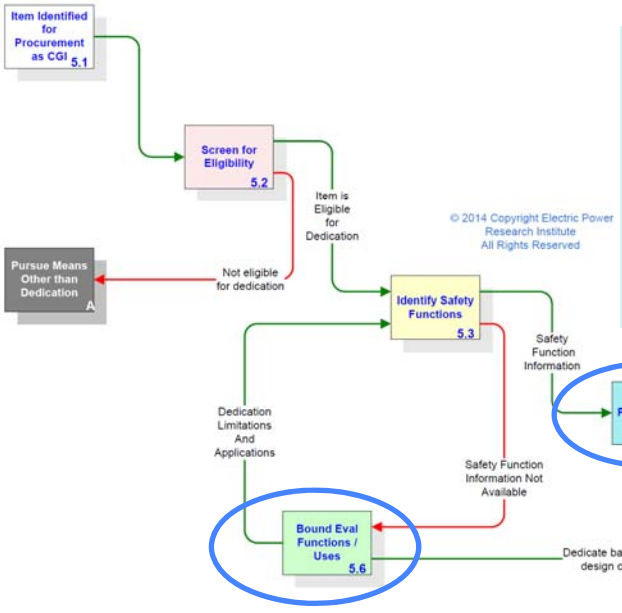
EPRI 3002002982 provides detailed guidance

- Conditionally endorsed by NRC RG 1.164

Acceptance criteria based upon plant function if original design and acceptance information are not available

Alternative to controlling an item in accordance with quality controls (described in 10CFR50, Appendix B) without use of dedication

Commercial Grade Item Dedication



- Challenges include:
  - Bounding functions and uses when end-use application is not known
  - Performing failure modes and effects analysis
  - Identifying *critical* characteristics

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Commercial Grade Computer Program Dedication

Flexible Approach for accepting design analysis computer programs

Does not include computer programs in plant equipment

Includes guidance for safety classification of computer programs

EPRI 3002002289 provides detailed guidance

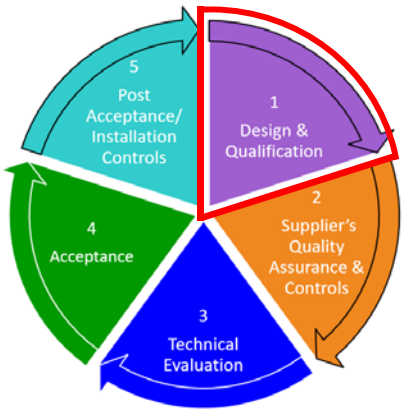
- Conditionally endorsed by NRC RG 1.231

EPRI 3002002289

Employs the concept of dependability characteristics

The amount of testing required for acceptance decreases as knowledge about the development process increases

Reverse Engineering



Process for gathering information needed to acquire a replacement item capable of performing intended design functions

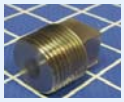
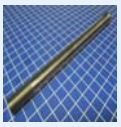
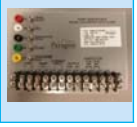
EPRI 3002011768 provides detailed guidance
- NRC staff participated in development

Typically applied when complete original design information is not available

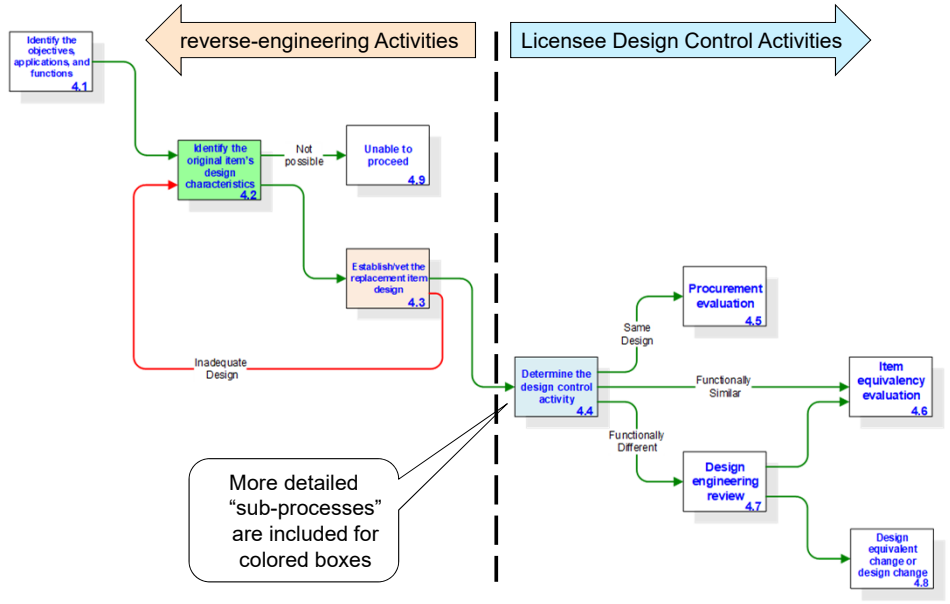
- Examination of an existing specimen
- Review and analysis of information available about the item's design and its design functions to enable manufacturing or otherwise facilitate acquisition of the item

Application of reverse-engineering techniques

- Inherent Risks
- Design control cannot be assumed
- Reverse-engineering involves:
  - Understanding of design functions
  - Understanding in situ conditions
  - Understanding interface requirements
  - Measures to ensure design is controlled
- Communication is critical
- Licensee must provide appropriate information

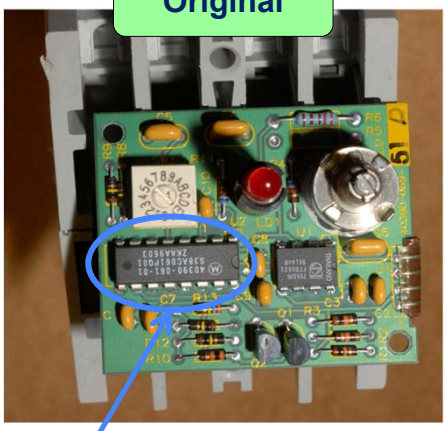
Purchasing an item with known attributes or design from a different supplier	
Recover characteristic information for commercial grade dedication	
Produce a functionally equivalent “part’ (simple item)	
Produce a functionally equivalent “component” (complex item)	

Basic process for applying reverse-engineering techniques



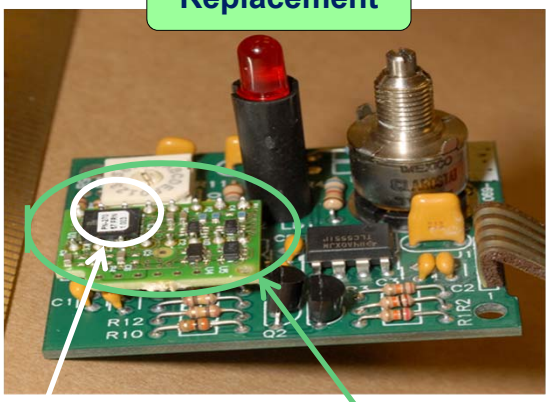
Undeclared Digital Content

Original



Non-programmable integrated circuit (i.e., no digital content)

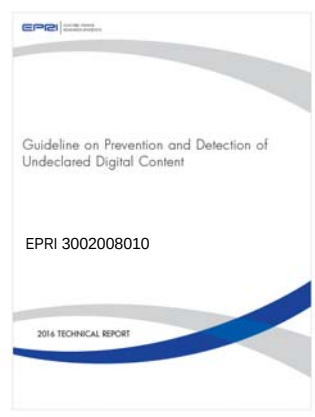
Replacement



Complex Programmable Logic Device (CPLD), indicating *digital content*

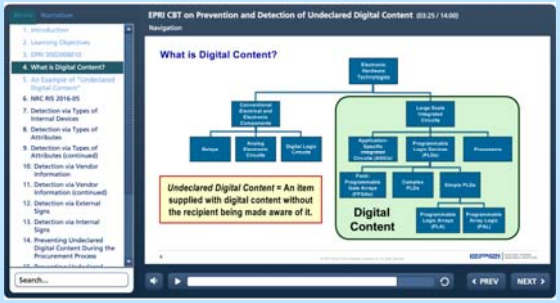
Mezzanine board in place of original integrated circuit

Undeclared Digital Content

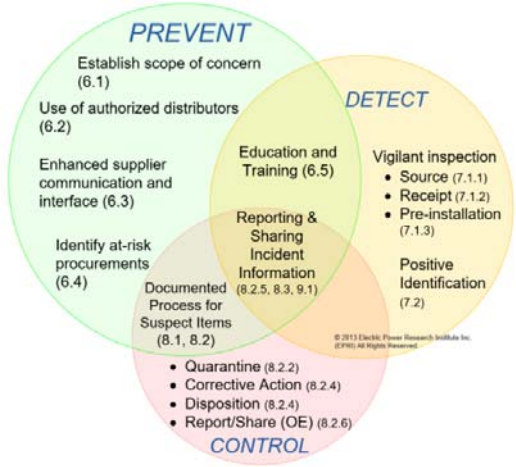


- Guidance for engineers

- Training for engineers, supply chain, receipt inspectors

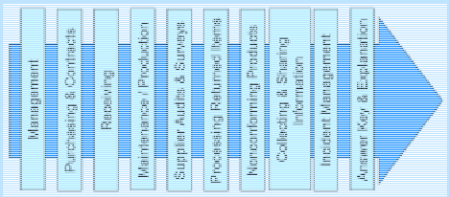


Counterfeit and Fraudulent Items

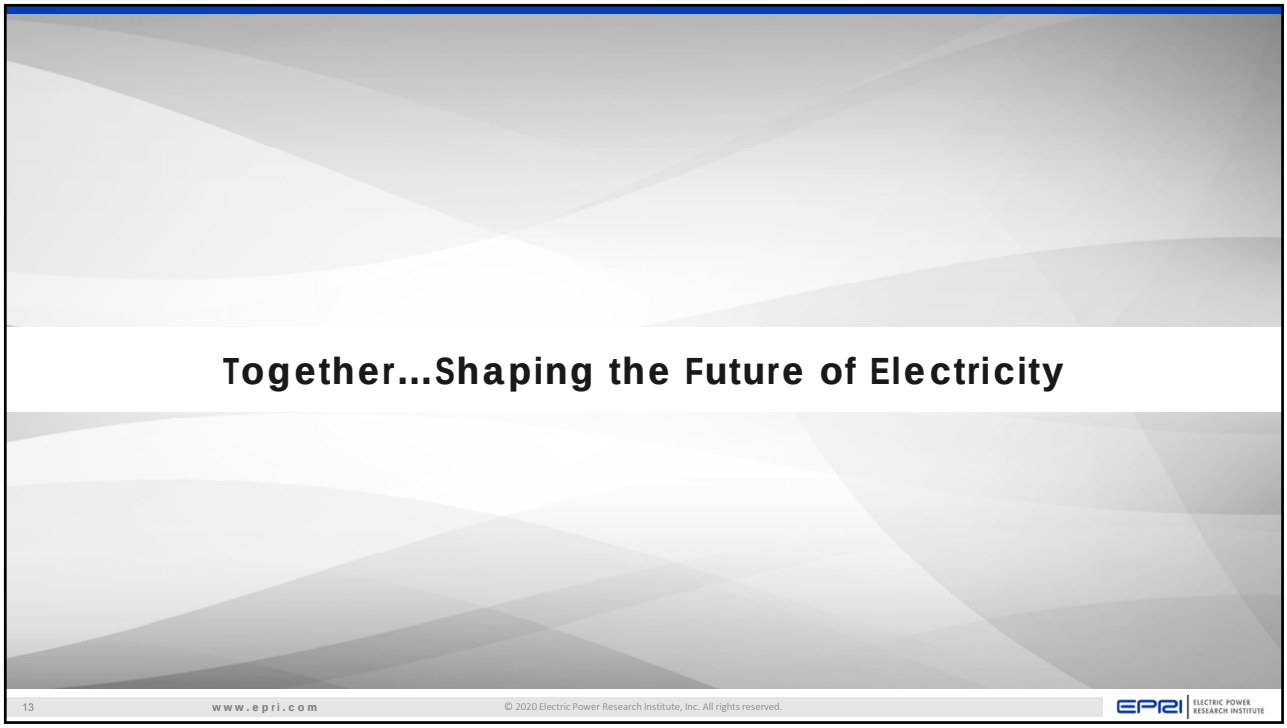


Guidance - EPRI 3002002276

Training for everyone



Self-Assessment Guide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