

I&C Obsolescence Solutions

EPRI Digital Systems Engineering Framework



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EPRI Plant Reliability and Resilience Program

VVER Technology Obsolescence and Ageing Workshop
March 2nd , 2026 Helsinki (remote)

Speaker Introduction

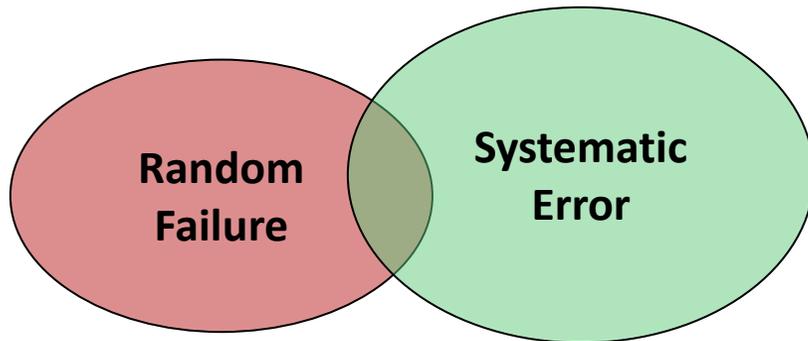
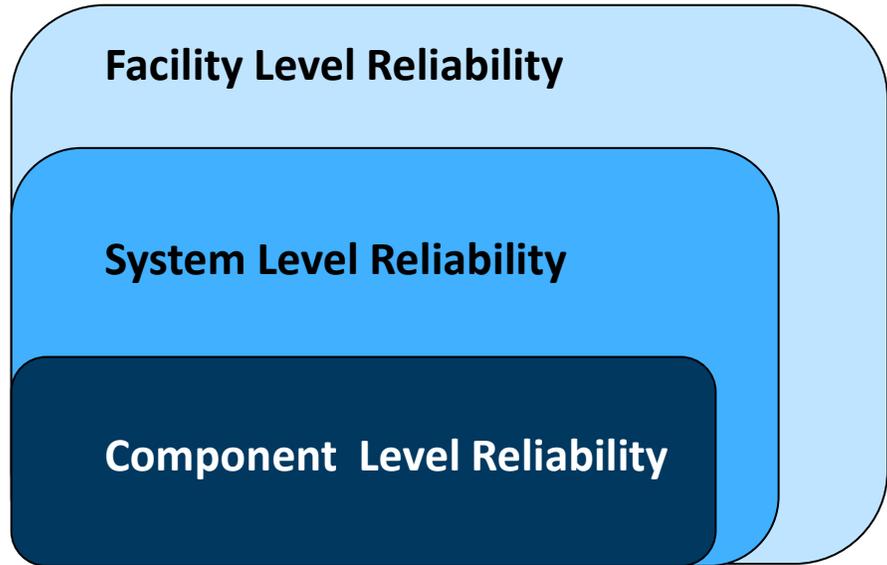
Matt Gibson:

**Licensed Professional Engineer- (Control Systems),
CISSP- (Certified Information Systems Security Professional)**

- EPRI- Since December 2013
- Duke/Progress Energy(US Utility)- 1982-2013
 - Fleet Digital Systems Architect- 2002- 2013
 - *NUSTART Digital I&C, HFE, and Cyber Security Lead AP1000*
 - *Duke/Progress Legacy Fleet Digital I&C Modernization Architect*
 - *Design and Systems Engineering Lead*
 - *Technology Assessment and Integration Lead*
 - Nuclear IT/OT Manager- Robinson Nuclear Plant 1994-2002
 - *Business and Digital I&C Systems*
 - *Telecommunications*
 - *Software Quality Assurance(SQA) and Cyber Security*
 - Digital I&C/Computer Technician and Specialist – 1982-1994
 - *System Development and Maintenance*
- US Navy – Electronic Warfare Specialist 1975 -1982
 - *Operated and maintained digital EW equipment in a complex tactical environment.*



Digital Reliability Model



Reliability Axioms

- Common Cause Failures must first have a failure or systematic error (including emergent behavior)
- Achieved Systematic and Random Reliability is inversely proportional to the likelihood of a CCF
- Reliability is best achieved via a cost, likelihood, and consequence equilibrium
- Net Functional Reliability is the prime objective (at the system/facility level)
- Focused Models can provide actionable reliability Insights (FTA, STPA, Relationship Sets)

- **Functional Reliability is an Equipment Level Challenge**
- **Functional Reliability is a Lifecycle Challenge**

- Lifecycle Tools For I&C Obsolescence Management

- Obsolescence is a lifecycle problem
- EPRI 3002031213

EPRI

Option	Productivity Improvement	Initial Investment	Long-Term Maintenance	Plant Risks	Project Risks
Full-Scope Modernization Strategy	High	High	Low	Medium	High
Limited-Scope Modernization Strategy	Medium	Medium	Medium	Low	Medium
Tactical Upgrades	Low	Low	High	Medium	Medium
"Maintain or Replace" Legacy Components	None	None	Very High	Very High	Very Low

2025 GUIDE

Digital I&C Lifecycle Strategy Guide (DLSG)
Revision 2

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- Lifecycle Tools For I&C Obsolescence Management

- Obsolescence is a Design Problem
- EPRI 3002031218

EPRI

The diagram illustrates the Systems Engineering Process with the following components and loops:

- Requirements Engineering** (top left):
 - Analyze System Goals and Environment
 - Identify Functional Requirements
 - Define/Refine Performance and Design Constraint Requirements
- System Analysis & Control** (top right):
 - Trade Space Analysis
 - Risk Management
 - Configuration Management
 - Data Management
 - Performance Measurement
- Functional Analysis & Allocation** (center):
 - Decompose to Lower Level Functions
 - Allocate Performance and Other Limiting Requirements to All Functional Levels
 - Define/Refine Functional Interfaces (Internal & External)
 - Define/Refine/Integrate Functional Architecture
- Design Synthesis** (bottom right):
 - Transform Architecture (Functional to Physical)
 - Define Alternative System Concepts, Configuration Items and System Elements
 - Select Preferred Solution
 - Define/Refine Physical Interfaces (Internal & External)
- Verification** (bottom left):
 - Verify Requirements
 - Verify Functional Architecture
 - Verify Physical Architecture

Loops:

- Requirements Loop:** Connects Requirements Engineering and System Analysis & Control.
- Design Loop:** Connects System Analysis & Control, Functional Analysis & Allocation, and Design Synthesis.
- Verification Loop:** Connects Design Synthesis, Functional Analysis & Allocation, and Requirements Engineering.

Systems Engineering Process

2025 GUIDE

Digital Engineering Guide (DEG) – Decision Making Using Systems Engineering
Revision 1

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Digital I&C Lifecycle Strategy Guide (DLSG) Rev 2

- Creates a Digital I&C Lifecycle Strategy
- Based on Four Core Strategies
- Used at the System, Unit, Site, and Fleet Level
- Includes Technical Strategy Development Tools
- Coordinates within the Framework for execution/implementation

Table 1-2
Four basic I&C Strategies

Option	Productivity Improvement	Initial Investment	Long-Term Maintenance	Plant Risks	Project Risks
Full-Scope Modernization Strategy	High	High	Low	Medium	High
Limited-Scope Modernization Strategy	Medium	Medium	Medium	Low	Medium
Tactical Upgrades	Low	Low	High	Medium	Medium
“Maintain or Replace” Legacy Components	None	None	Very High	Very High	Very Low

Digital Engineering Guide (DEG) Revision 1

- Digital Systems Engineering Framework Core
- Topic 12 is Lifecycle Management
- Topic 5 is Procurement
- Topic 9 is Plant Integration (includes cables)
- Activities in each phase from initial scoping to O&M
- Provides a Obsolesces Risk and Impact analysis
- Drives Obsolesence Decisions
- **DEG can be used to model an existing design and make obsolescence determinations.**
- Process Driven(Systems Engineering)
- Reactor Technology and Regulatory Agnostic



EPRI Framework Introduction

1. The EPRI Digital Systems Engineering (DSE) Framework is intended to normalize and align nuclear I&C design and maintenance activities with other safety-related process industries who have achieved a high level of safety, efficiency, and economy through continuous improvement and optimization. Key methodologies are systems engineering and functional safety.
2. The Framework is composed of 12 integrated guidelines that together provide a complete systems engineering process for the design and maintenance of modern control and monitoring systems in nuclear power plants.
3. The Digital Engineering Guide (DEG) is the core of the Framework. The DEG provides the Systems Engineering Process as well as scoping pathways via a graded approach.
4. HAZCADs and DRAM provide the core of functional safety and implement Process Hazard Analysis (PHA) and Layer of Protection Analysis (LOPA) along with the required reliability analysis. These concepts are extended to HFE, Cyber Security, and EMC.

EPRI's Digital Systems Engineering Framework- 4 pillars

EPRI's *high-quality engineering process* uses the same modern methods and international standards used in other safety related industries to reduce implementation cost

Use of Systems Engineering

Use of a modern, high performance, single engineering process that leverages systems engineering in the transition to team-based engineering for conception, design, and implementation (ISO/IEC/IEEE-15288). www.incose.org

Utilize Industry Standards

Use the same proven design and supply chain structures that non-nuclear safety related industries use (IEC-61508/61511/62443). This leverages the effectiveness and economies-of-scale achieved in other industries.

Risk Informed Engineering

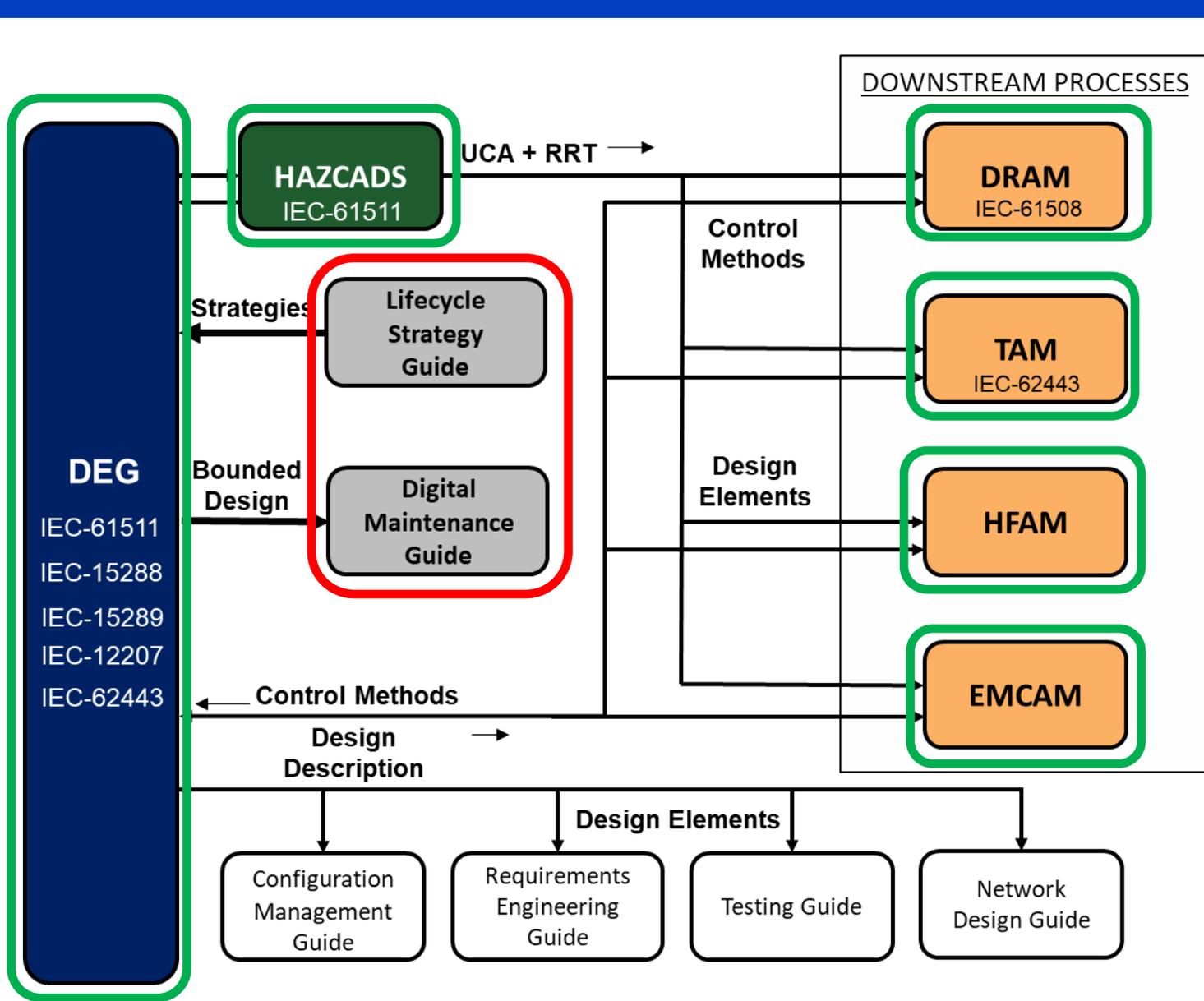
Making effective engineering decisions via hazard, reliability, and risk analysis to integrate all digital engineering topics into a single engineering process.

Capable Workforce

Modern Methods to Support Nuclear Fleet Sustainability and Advanced Reactor Design

Digital Systems Engineering Framework Highlights

- Systems Engineering Based - Single Process
 - ✓ Addresses all elements of new, upgraded, or modified I&C designs
 - ✓ Usable for both new reactor and legacy plant modifications/upgrades
 - ✓ Risk-Informs Functional Safety, Reliability, Cyber Security, Human Factors, EMC at the design level.
 - ✓ Achieves requirement completeness via hazards analysis, iteration and validation. **Systems Theoretic Process Analysis (STPA)** and **Fault Tree Analysis(PRA)** are the integrated hazard and risk analysis tools (HAZCADS).
 - ✓ Fully addresses Functional Achievement, Common Cause Failure (CCF) and Single Point Vulnerability(SPV) concerns.
 - ✓ Provides feedback to the PRA/PSA/Licensing process to close the loop on risk determinations.



DEG – Synthesizes the Systems Engineering framework from IEC-15288. Includes all relevant Lifecycle topics. Takes strategic input from the Lifecycle guide and formulates design description.

HAZCADS – Uses STPA/FTA to identify hazards and associated UCA. FTA and Risk Matrices develop a Risk Reduction Target (RRT) which informs the downstream processes. Implements a PHA/LOPA from IEC-61511.

DRAM – Identifies Hardware and Software reliability vulnerabilities and develops Loss Scenarios. Formulates and scores Control Methods to protect, detect, and respond/recover from UCA to meet the RRT.

TAM – Identifies cyber security vulnerability classes and develops Exploit Sequences. Develops and scores control methods to protect, detect and respond/recover from UCA to meet the RRT.

HFAM – Identifies important human actions and develops Loss Scenarios. Identifies and scores control methods to “design out” Human Error until meeting the RRT.

EMCAM – Identifies EMC vulnerability classes. Develops and scores protect, detect, and respond/recover control methods using the RRT

RRT= Risk Reduction Target STPA=System Theoretic Process Analysis LOPA= Layers of Protection Analysis PHA=Process Hazards Analysis
 UCA= Unsafe Control Action FTA= Fault Tree Analysis EMC= Electromagnetic Compatibility

The Digital Systems Engineering Framework Guides

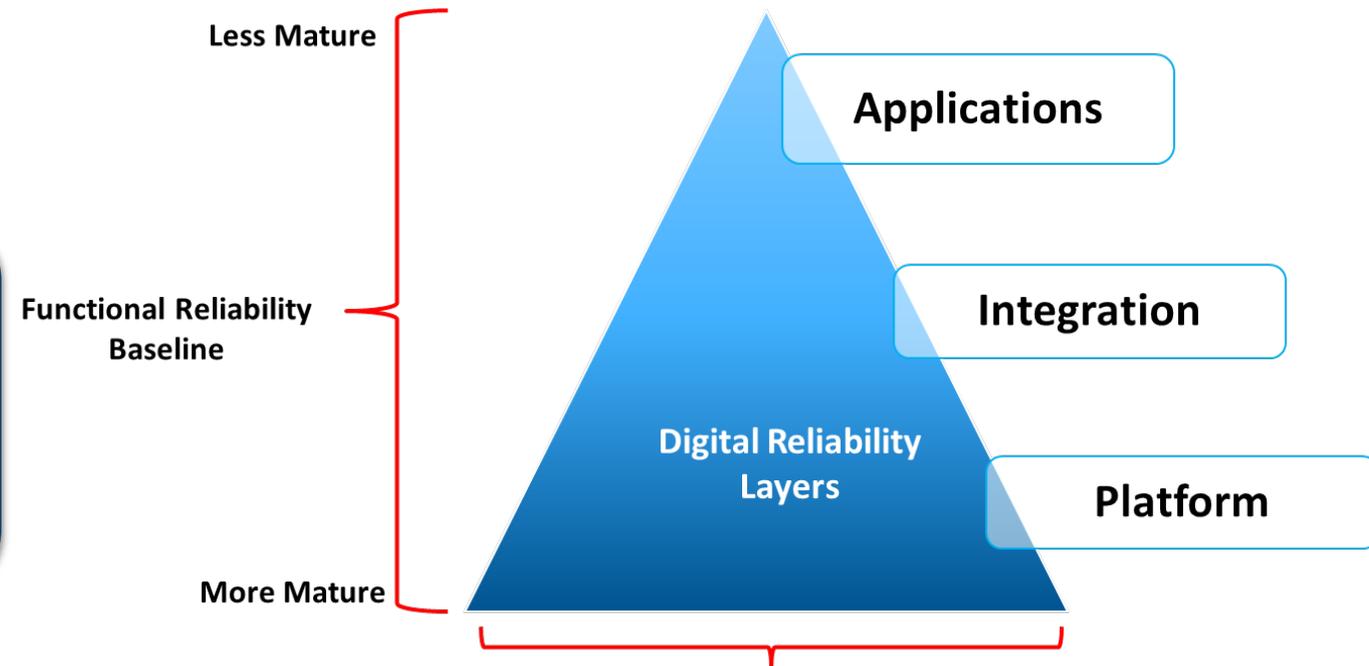
Product ID	Title	Item Type
3002031207	Cyber Security Technical Assessment Methodology (TAM)- Risk Informed Exploit Sequence Identification and Mitigation: Revision 2	Guide
3002031208	Network Design Guide (NDG)- Use Case Based Approach for Operational Technology (OT) Networks: Revision 1	Guide
3002031209	Digital Maintenance and Management Guide (DMG): Revision 0	Guide
3002031210	Digital Systems Configuration Management Guide (DCMG): Revision 1	Guide
3002031211	Digital Systems Requirements Engineering Guide (DREG): Revision 1	Guide
3002031212	Digital Systems Testing Strategies and Methods (DTS): Revision 1	Guide
3002031213	Digital IC Lifecycle Strategy Guide (DLSG): Revision 2	Guide
3002031214	Electromagnetic Compatibility Assessment Methodology (EMCAM): Revision 1	Guide
3002031215	Human Factors Analysis Methodology (HFAM) for Digital Systems- A Risk-Informed Approach to Human Factors Engineering: Revision 1	Guide
3002031216	Digital Reliability Analysis Methodology (DRAM): Revision 1	Guide
3002031217	Hazards and Consequence Analysis for Digital Systems (HAZCADS): Revision2	Guide
3002031218	Digital Engineering Guide (DEG) - Decision Making Using Systems Engineering: Revision 1	Guide

12 Harmonized and Updated Guides (EMCAM R1 in 2026)

Safety Integrity Level (SIL) Efficacy for Nuclear Power

- EPRI research on field failure data from SIL certified logic solvers revealed no **platform level** Software Common Cause Failures (SCCF) after over 2 billion combined hours of operation for IEC-61508 SIL certified PLC's (3002011817)
- Indicates that using existing SIL certifications, at the **platform level**, has a high efficacy for use as replacements for some existing design and review processes.
- **Leveraged for NEI 17-06/RG-1.250 and NEI 20-07 in US**

Functional Reliability, which includes software, hardware, and human elements should be segmented by layers: **platform, integration, and application.** Then Considered Separately



DSE Framework Achievement Summary



The core framework (DEG) has been adopted in the US via mandatory Efficiency Bulletin, EB 17-06 Rev 2.



750+ partitioners trained on the DEG R0 and R1 since 2020. 50+ NRC staff trained via custom developed DEG and TAM classes (NRC funded). DEG R1 Training available since August 2025.



EPRI Safety Integrity Level (SIL) Efficacy R&D used by NEI in NEI 17-06 to allow SIL certifications to be accepted as indicators of platform reliability/dependability without further review. NRC Endorsed via RG 1.250.



EPRI Cyber TAM was used by Vogtle 3&4 to assess and mitigate the large number of digital cyber components in the AP-1000 saving several million dollars. This new method has been accepted by the US NRC via a favorable Vogtle 3 cyber inspection.

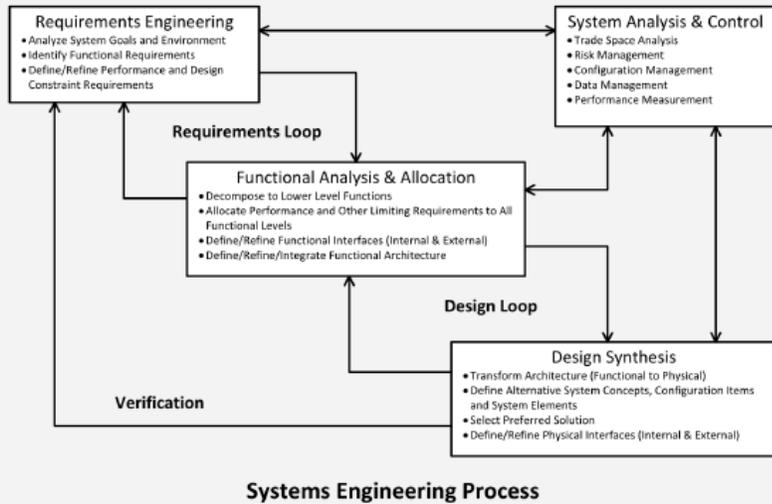


Leveraging the DEG/HAZCADS/DRAM, NEI is pursuing a risk-informed and performance-based solution for digital I&C reliability/CCF. This effort is current fluid based on US political developments, but this proposal triggered new NRC policy development and approval (SECY/SRM- 022-0076). Supports the LMP and PSA for New Reactors

DSE Framework Summary

- The Digital Systems Engineering Framework is a modern implementation of systems engineering that integrates all technical topics into a single process. Better results in less time.
- The Framework promotes the completeness of requirements via diagnostic iterations using an “All Hazards” approach.
- The Framework seeks both Safety and Efficiency in Nuclear I&C design by leveraging modern risk-informed standards from non-nuclear process industries. Focuses on the right work with the most impact.
- The Framework can be optimized through repetitive use.
- The framework can be used for new build and legacy nuclear plant design and is regulatory agnostic.

Systems Engineering Community– www.incose.org



2025 TECHNICAL REPORT

Digital Engineering Guide (DEG) – Decision Making Using Systems Engineering

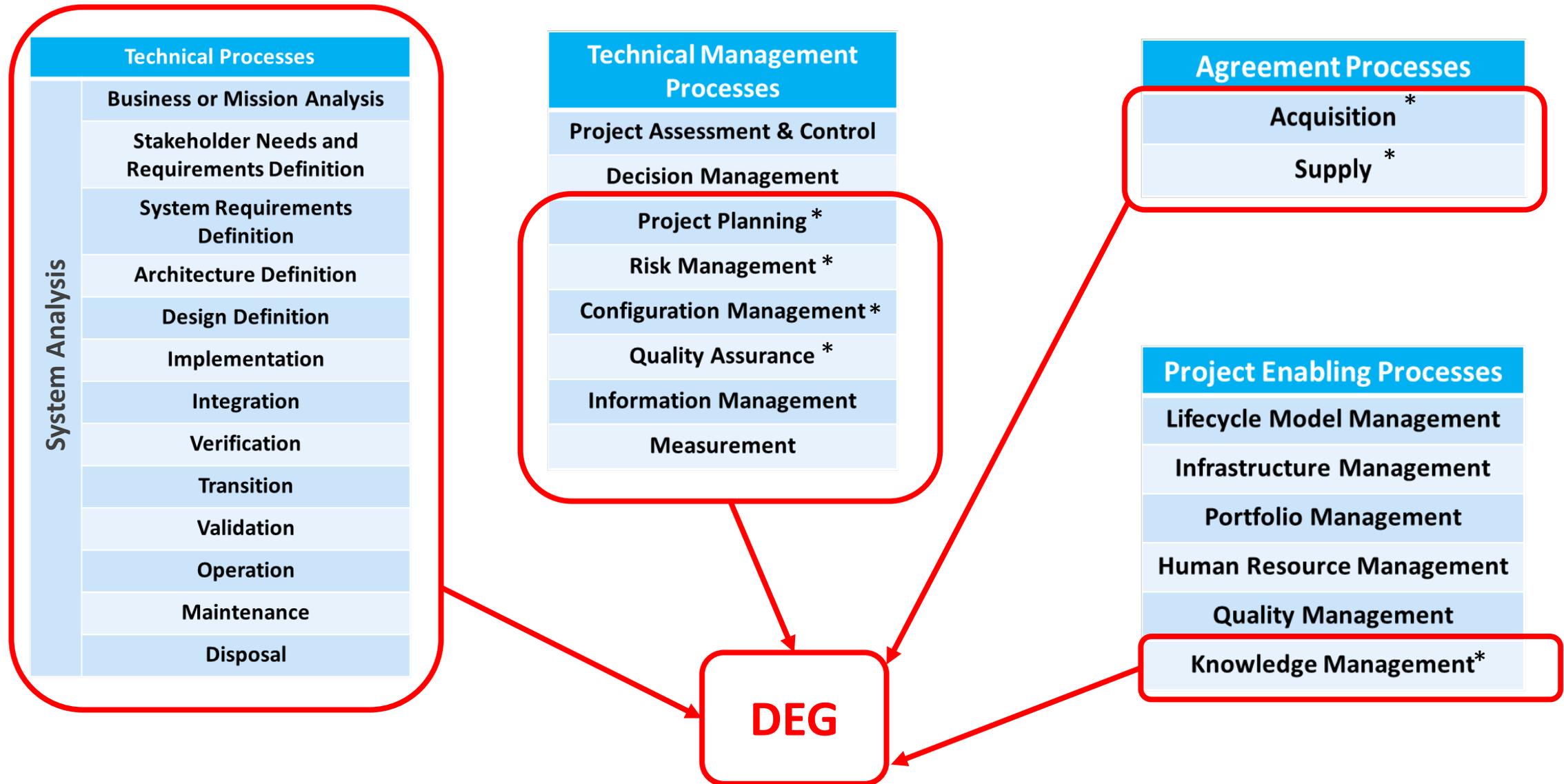
Revision 1

Digital Engineering Guide(DEG)- Decision Making Using Systems Engineering Revision 1 3002031218



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ISO/IEC/IEEE-15288 and 12207 Processes Scoped within the DEG



*Scoped to a limited extent

DEG Revision 1 Activity Arrangement

- The organization of the DEG R1 to a “by phase” view which allows better comprehension across the lifecycle and highlights the “all topic” integration in each phase.
- Activity numbers are formatted by Phase.Topic.Sequence.

The Phases are:

- Phase 1-Initial Scoping (1.X.X)
- Phase 2-Conceptual Design (2.X.X)
- Phase 3- Detailed Design (3.X.X)
- Phase 4-Installation Planning Phase (4.X.X)
- Phase 5-Installation and Test Phase (5.X.X)
- Phase 6-Closeout Phase (6.X.X)
- Phase 7-Operations and Maintenance Phase (7.X.X)

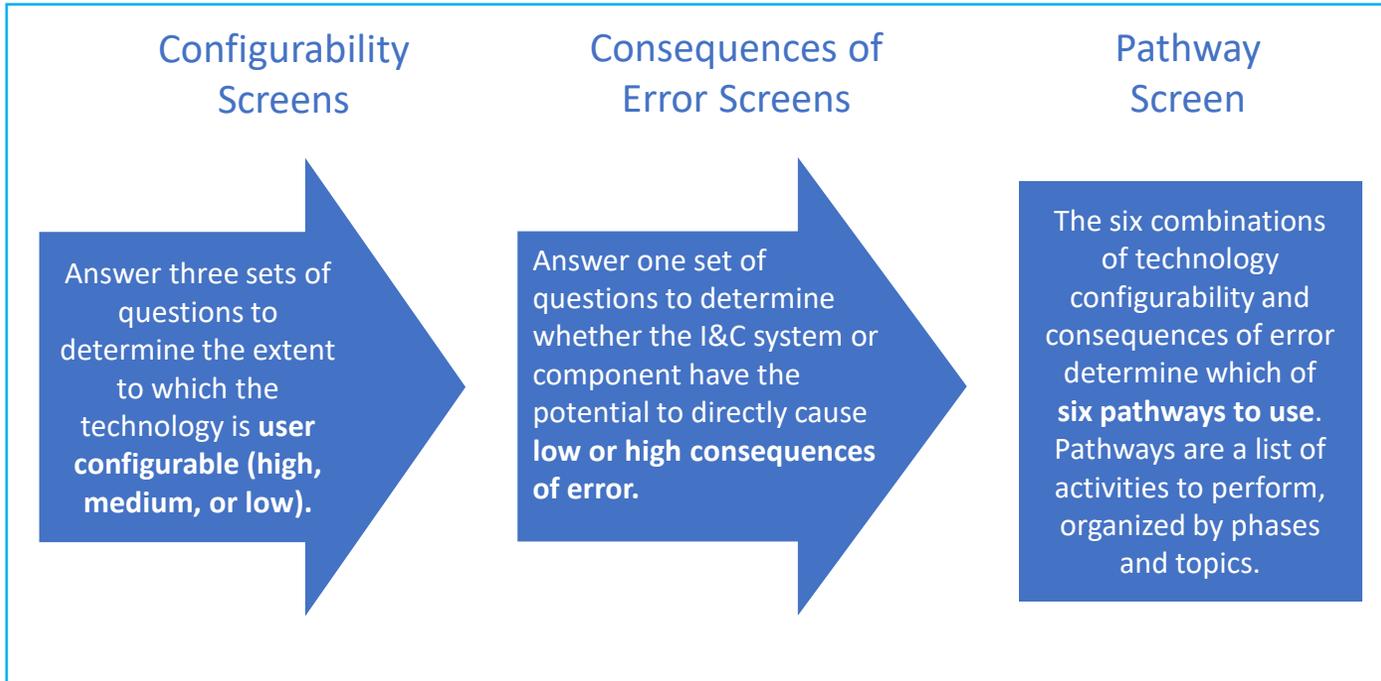
DEG Activity Topics

- Topic 4 – Systems Engineering (X.4.X)
- Topic 5 – Procurement (X.5.X)
- Topic 6 – Human Factors Engineering (X.6.X)
- Topic 7 – Data Communications Engineering (X.7.X)
- Topic 8 – Cyber Security Engineering (X.8.X)
- Topic 9 – Plant Integration Engineering (X.9.X)
- Topic 10 – Testing (X.10.X)
- Topic 11 – Configuration Management (X.11.X)
- Topic 12 – Lifecycle Management (X.12.X)

DEG Revision 1 Screening Architecture

- Centralized scoping/risk screens and decisions using Attachment A with instructions early in the DEG. This allows streamlined and efficient screening and scoping decisions.
 - Centralization also allows screens to be done by supervision/planners/designated screener vs. the engineering resource.
 - Centralization allows the DEG scope (net inventory of activities) to be expressed as pathways (1-6) , topics scoped in, conditional decisions, and the Hazard/Reliability route selected. This promotes ease of contracting of engineering support and internal planning.
- In the US, the industry uses the industry standard procedure NISP-EN-04 to couple the DEG to the standard design process (IP-ENG-001). While NISP-EN-04 requires the DEG, the DEG does not need and is unaware of NISP-EN-04. This allows the DEG to be used for systems and projects that scope out of the SDP in the US.
 - While the DEG **does not require an implementing procedure**, centralized scoping allows “lightweight” or narrowly scoped design procedures using the pathway, topic, conditional decision, route criteria along with the level of interest in the US and Globally.

DEG Initial Screening Process Attachment A



Risk Informed Design Routes

Management will determine which Hazards and Diagnostics Route to use (if any) based on stakeholder needs for risk and reliability analysis as well as project scope. This choice affects only a few activities (see table below)

DEG activities provided with two routes

DEG Activity	Route One	Route Two
2.4.10 (Hazard Analysis)	HAZCADS	Stakeholder Tolerance
2.4.11 (Reliability Analysis)	DRAM	FMEA ⁶ & Reliability Analysis
2.4.12 (CCF Coping)	N/A	Manual Action/Automation
2.5.1 (Item Suitability)	SIL/SC Verification	Suitability Guidance
Topic 6 (Human Factors Engineering)	HFAM ⁴ with DHEP	HFAM ⁴ Without DHEP
Topic 8 (Cyber Security Engineering)	TAM ⁶ Pathway 1a	TAM ⁶ Pathway 1a
2.9.6 (EMC Design)	EMCAM	EPRI TR-102323
3.4.6 (Hazard & Reliability Analysis)	HAZCADS & DRAM	FMEA & Reliability Analysis

Topical Screens

Answer six questions to determine whether to **screen out any combination of six corresponding topics** (e.g., procurement, human factors engineering, data comms engineering, etc.) in their entirety from the analysis. Note that three topics (systems engineering, testing, and configuration management) cannot be entirely screened out.

DEG topics

No.	Topic
4	Systems Engineering*
5	Procurement
6	Human Factors Engineering
7	Data Communications Engineering
8	Cyber Security Engineering
9	Plant Integration Engineering
10	Testing*
11	Configuration Management*
12	Digital Lifecycle Management

* Required Topic

Level of Interest Determination

What is the level of interest that results from activity 1.4.1? Select A, B, C, D, or E. Use this determination to:

- 1) Look up the action guidance within the activities that screen in on the project, and
- 2) Follow the level-specific guidance for the core activities

DEG Revision 1 Activity Context

- Uses “Highly Recommended” , “Conditional, and “ Not applicable” to align with modern methods and standards in the functional safety and systems engineering community and avoid confusion with procedure terminology.
- The DEG is not a Procedure.
 - Screening decisions require no justification unless they contradict a “Highly Recommended” item.

Activity	Screen	Conditional Response			Action	Final Response		Division of Responsibility				
		Yes	No	TBD		Yes	No	Internal	External	Split	Entity(s)	
Conceptual Design Phase												
2.4.1	Division of Responsibility	Will the responsibility for performing DEG activities be divided or split among different organizations?			If yes, perform this activity as guided by the DEG.							
2.4.3	Analytical Insights	Will the project introduce or change an I&C system or component application that can interact with or adversely affect multiple plant systems or components?			If yes, perform this activity as guided by the DEG.							
2.4.4	OE Insights	Perform Operational Data Review			Perform this activity as guided by the DEG.							
2.4.5	Requirements	Identify Bounding Technical Requirements			Perform this activity as guided by the DEG.							
2.4.6	Requirements	Elicit Input and Confirmation of Bounding Technical Requirements			Perform this activity as guided by the DEG.							
2.4.9	Design	Synthesize the Conceptual Design			Perform this activity as guided by the DEG.							
2.4.13	Implementation	Would it be beneficial to implement any system elements identified in this phase of the project?			If yes, consider performing this activity as guided by the DEG.							
2.4.14	Verification & Validation	Verify & Validate the Conceptual/Common Requirements, Architecture, Design, and Implementation			Perform this activity as guided by the DEG.							
2.5.2	Procurement	Will the digital items to be procured be subject to any further architecture, design, implementation, qualification, and/or test			If yes, perform this activity as guided by the DEG.							
2.5.3	Oversight	Would it be beneficial to perform vendor oversight in this phase of the project?			If yes, perform this activity as guided by the DEG.							
2.8.1	Attack Surface	Characterize the Attack Surface			Perform this activity as guided by the DEG.							
2.8.2	Engineered Controls	Identify and Allocate Engineered Security Control Methods			Perform this activity as guided by the DEG.							
2.8.4	Shared Controls	Identify and Allocate Shared Security Control Methods			Perform this activity as guided by the DEG.							
2.9.1	Interfaces	Identify the Conceptual Interface Design			Perform this activity as guided by the DEG.							
2.9.2	Electrical Independence	Do the bounding technical requirements include a requirement for electrical independence?			If yes, perform this activity as guided by the DEG.							
		Does the proposed design introduce or change any			If yes, perform this activity as guided by the							

2.4.5 Identify Bounding Technical Requirements

Applicability

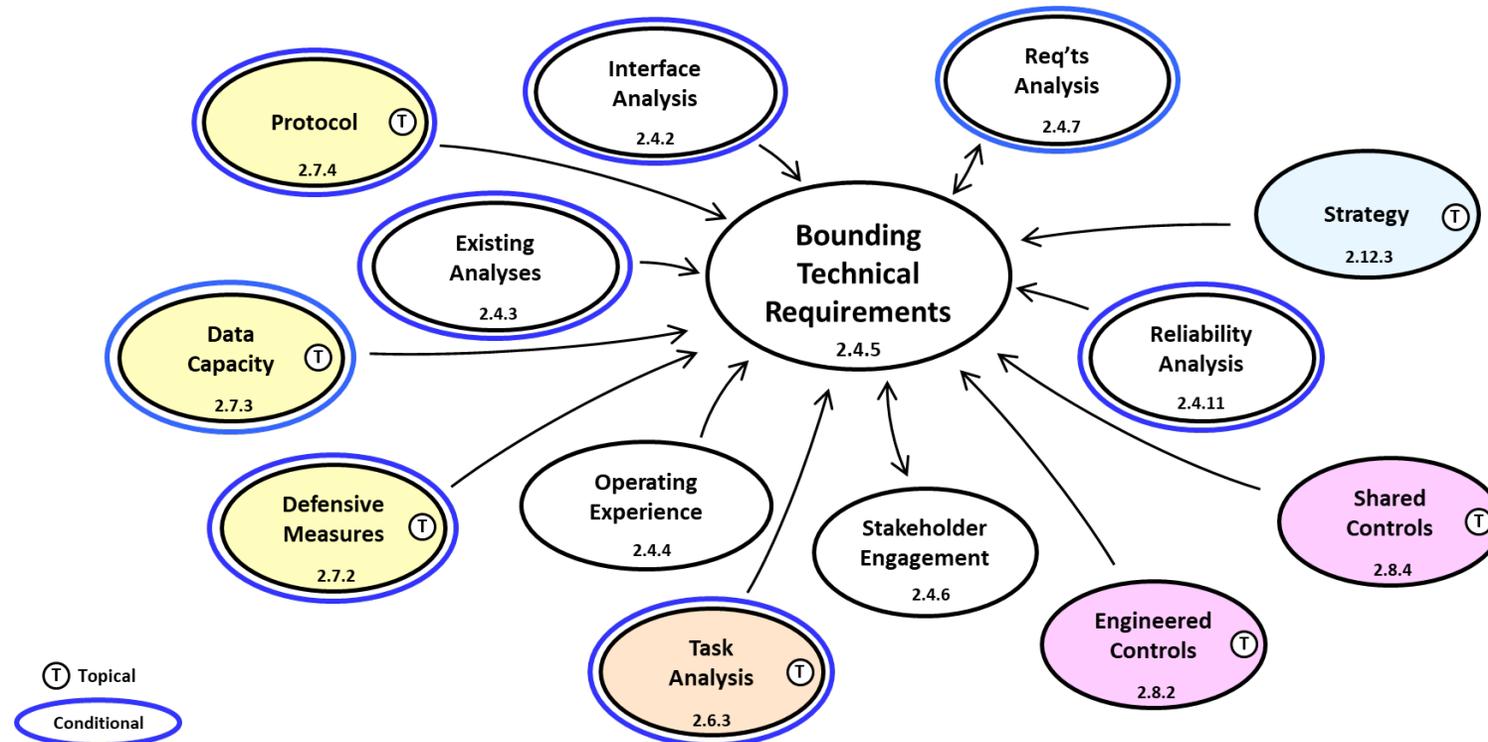
Pathway	Applicability
1-6	Highly Recommended

Action

Level	Action
A-D	Identify the bounding technical requirements using the guidance below.
E	Verify the bounding technical requirements for the affected system or component are not being changed. If they are, go back to Activity 1.4.1 and reevaluate the change.

DEG Revision 1 Activity Groups

- DEG Revision 1 describes the relationships between activities as activity groups with the attendant concept of core and peripheral activities.
- DEG R1 has 15 activity groups.
 - This allows the practitioner to use activity groups with core activities to focus on design decisions and select the optimum inventory of peripheral activities to support the given scope.



Relationship Sets > Activity 2.4.8 & Attachment C/D

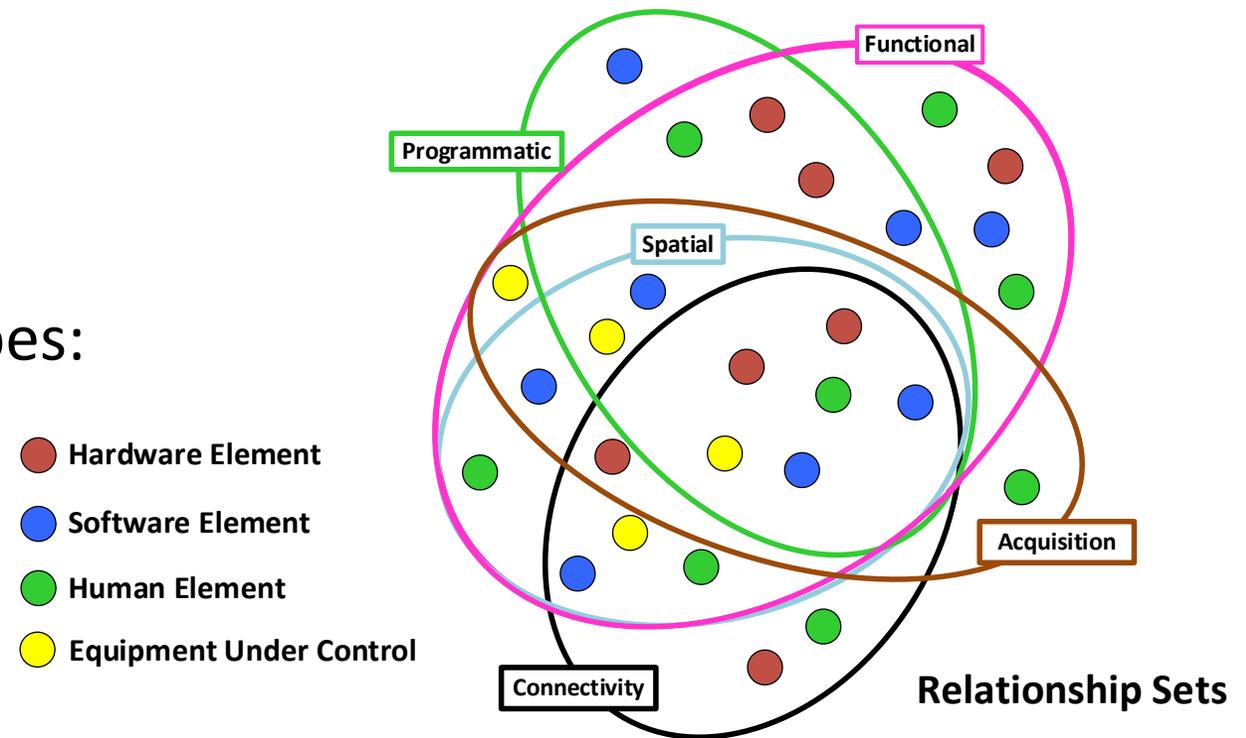
Relationship sets are an architecture tool and contain all system elements scoped within the new design or design change. Developed with SE in the DEG.

There four bounded system element types

- Hardware
- Software
- Human
- Equipment Under Control

There are five bounded relationship set types:

- Functional
- Connectivity
- Spatial
- Programmatic
- Acquisition



Models the Relationship/Dependencies Between System Elements

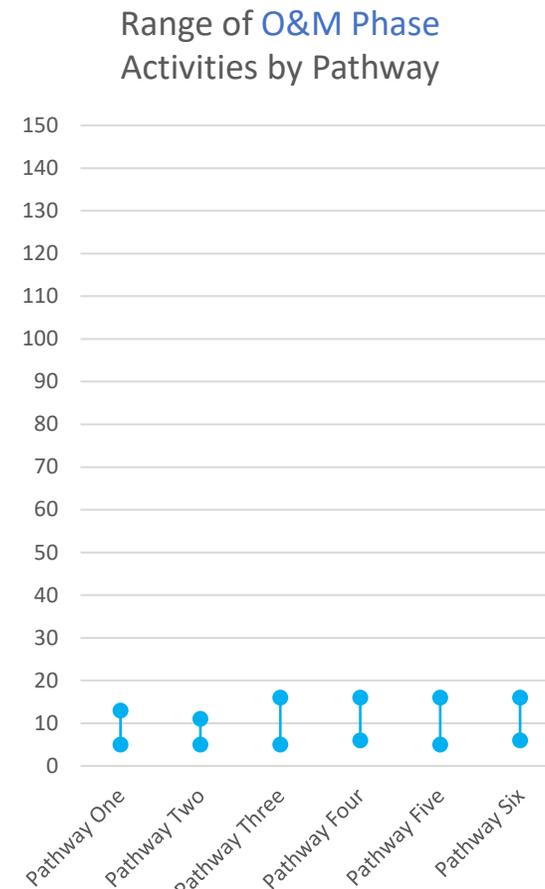
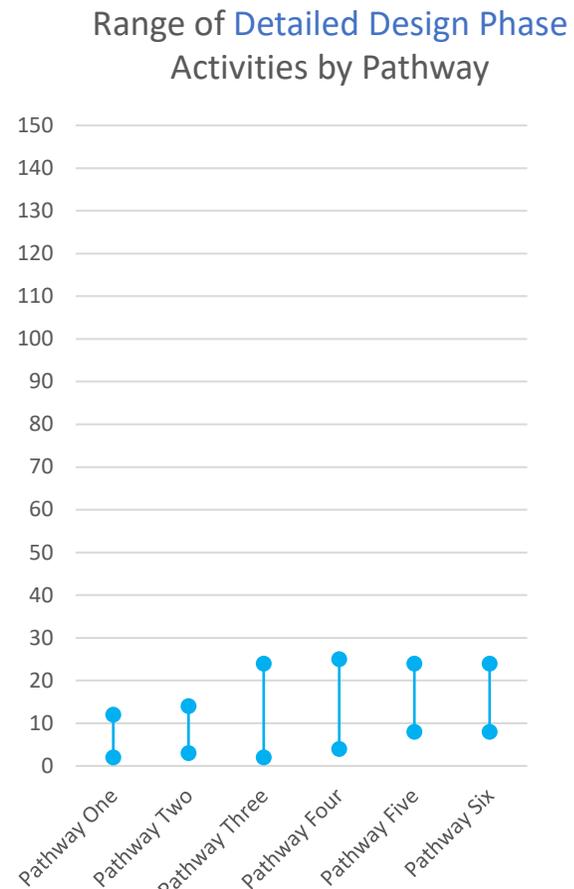
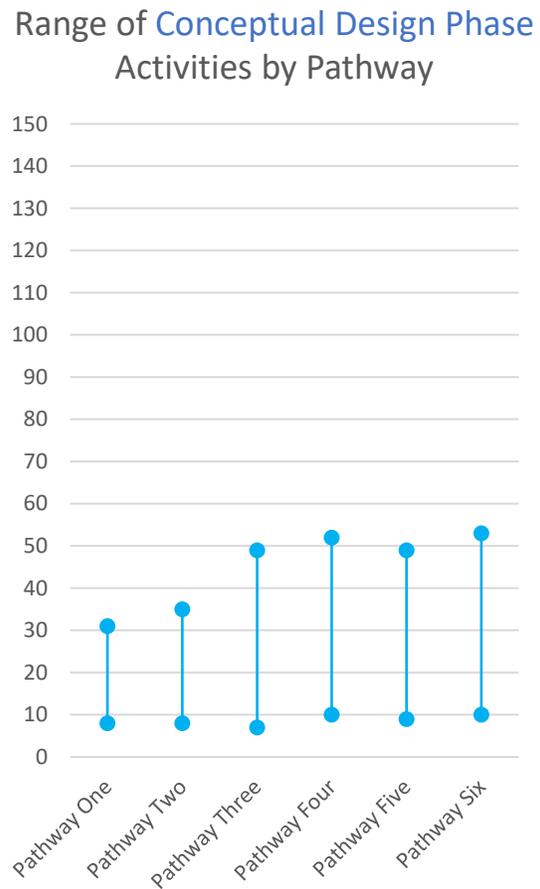
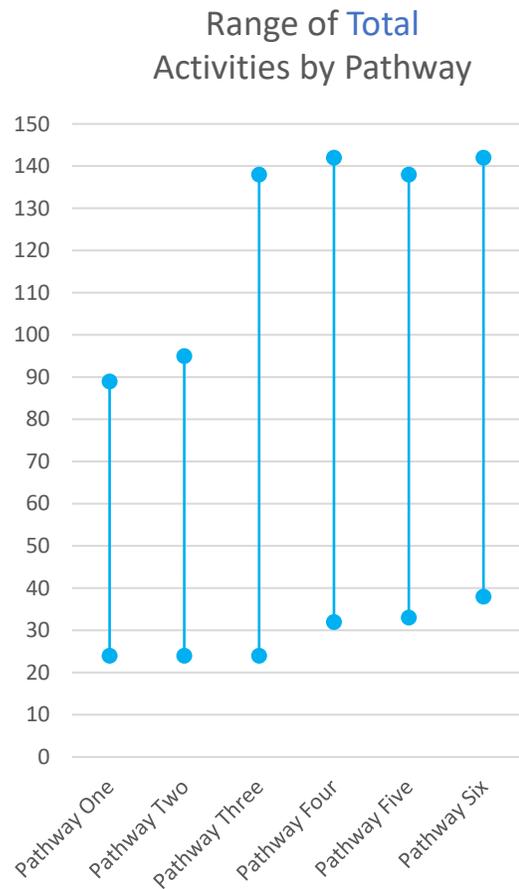
DEG Revision 1 Process Routes

- Revision 1 provides two routes (when activity 2.4.10 is selected) for risk informing the design through hazards and reliability analysis.
 - Route 1 uses integrated bounded risk assessments, hazards analysis, and reliability analysis to diagnose and inform requirements and design decisions.
 - Route 2 uses a more traditional method using given risk levels and FMEA Analysis.

DEG activities provided with two routes

DEG Activity	Route One	Route Two
2.4.10 (Hazard Analysis)	HAZCADS	Stakeholder Tolerance
2.4.11 (Reliability Analysis)	DRAM	FMEA ⁸ & Reliability Analysis
2.4.12 (CCF Coping)	N/A	Manual Action/Automation
2.5.1 (Item Suitability)	SIL/SC Verification	Suitability Guidance
Topic 6 (Human Factors Engineering)	HFAM ⁴ with DHEP	HFAM ⁴ Without DHEP
Topic 8 (Cyber Security Engineering)	TAM ⁶ Pathway 1a	TAM ⁶ Pathway 1a
2.9.6 (EMC Design)	EMCAM	EPRI TR-102323
3.4.6 (Hazard & Reliability Analysis)	HAZCADS & DRAM	FMEA & Reliability Analysis

Range of Activities across Pathways



The DEG spans a wide scope range from a minimum of 22 activities in Pathway 1 to maximum of 142 activities in Pathway 6 depending on topical and conditional decisions

DEG Rev 1 Attachments

- DEG R1 Attachments are independent files attached to the Main DEG .pdf and can be used independently and are best viewed with Adobe tools as some third-party PDF readers do not detect the attachments



- ❖ Attachment A - Screening & DOR Workbook. Excel format
- ❖ Attachment B - Optimizing a Digital Engineering Organization. PDF format
- ❖ Attachment C - Relationship Sets Guidance. PDF format
- ❖ Attachment D - Relationship Set Data Sheet (RSDS) template. Word format
- ❖ Attachment E - FMEA & Reliability Analysis. PDF format
- ❖ Attachment F - FMEA Data Sheet. Excel format
- ❖ Attachment G - Software Engineering. PDF format
- ❖ Attachment H - Requirements Engineering. PDF format
- ❖ Attachment I - Software Fault Analysis. PDF format
- ❖ Attachment J – Stakeholder Risk Tolerance. PDF format
- ❖ Attachment K- CCF Coping Analysis. PDF Format
- ❖ Attachment L- Obsolescence Risk Assessment Worksheet

EPRI Digital Framework Training and Future Pilots

Key Workforce Development Tools

HAZCADS/DRAM

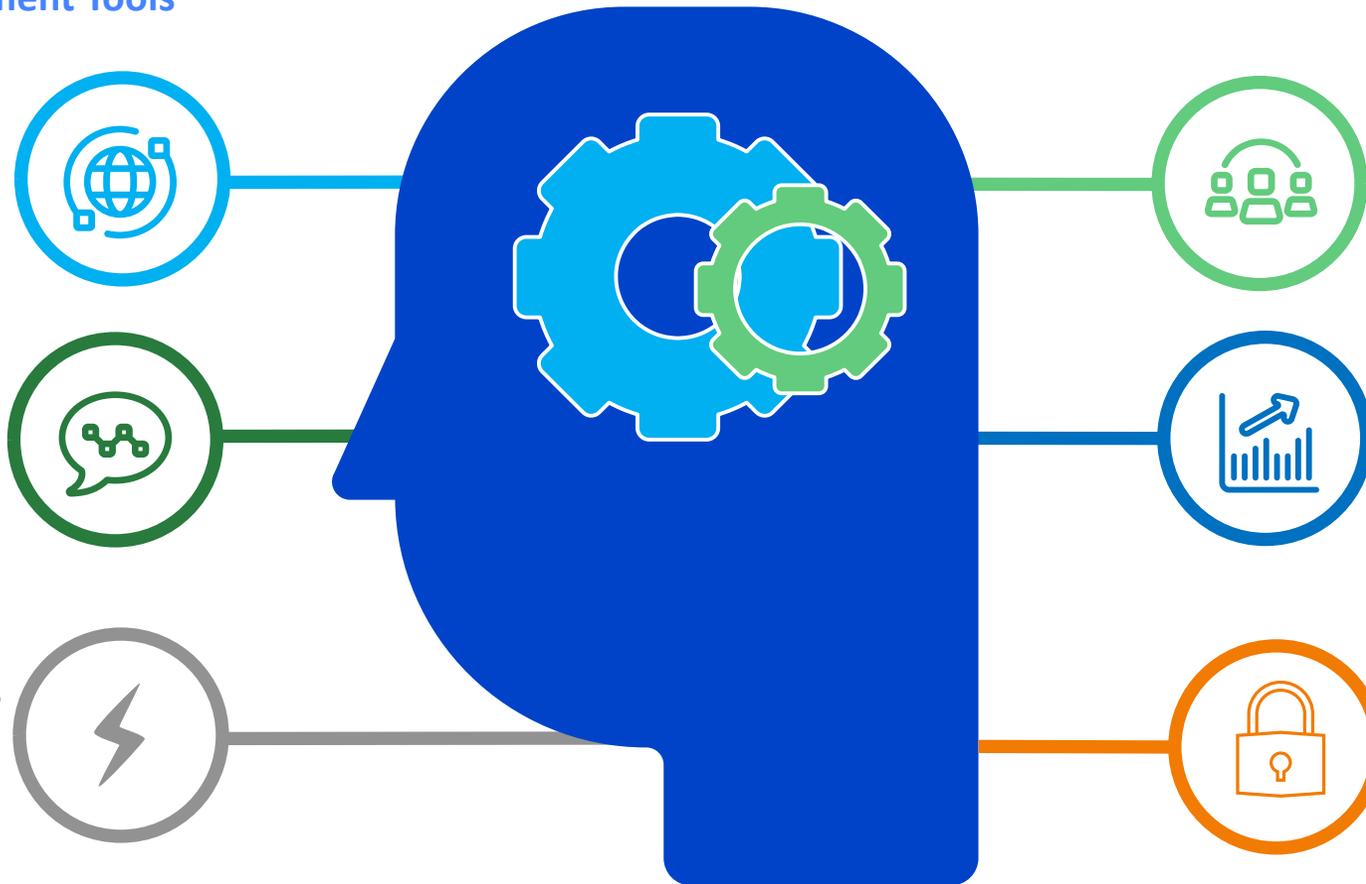
Training Bundle includes STPA and e-learnings developed and ready for delivery

HFAM R1

Integrates HRA and HFE fundamentals into the DEG/HAZCADS process
Pilot in Q2 2026

EMC Fundamentals

Review foundational principles including coupling, grounding, filtering, shielding, etc.



DEG R1 for Practitioners

Developed and being delivered.
8 in 2025, 6 scheduled in 2026

DEG R1 for Managers & Auditors

Brings the DEG into focus for managers and auditors.
Strong industry need.

TAM Rev 2 Pilot

Adds pathways and integrates cyber security more with the EPRI Digital Framework. Pilot in March 2026

EPRI's training architecture is now mixed mode to achieve better results at less cost – Participants needed for TAM and HFAM pilots

Digital Systems Engineering User Group – 3002022140

Supplemental Funded:

A forum for information sharing of digital specific material

- ✓ Operational Experience
- ✓ Lessons Learned
- ✓ Interactive community
- ✓ Common Design Packages
- ✓ Cyber Security Evaluations
- ✓ Member Feedback

Current Activities:

- ✓ Harmonization update of the Digital Systems Engineering Framework has been completed. 11 of the DSE guides have been published.
- ✓ EMCAM Revision 1 will publish in 4Q 2026
- ✓ Continued expansion of the member sharing website.
- ✓ Nuclear Digital Project Experience Report 2025 will be published in early 2026. Updated annually, members of this supplemental can download the 2024 report here: [3002029458](https://www.dseug.com/3002029458). This report provides a baseline of installed digital equipment across DSEUG members.

August 2026 Meeting Charlotte
August 18th and 19th 2026
Current Members to Date (30)

AECON
ABB
American Electric Power (DC Cook)
Ameren (Calloway)
Bruce Power
Constellation Energy
Curtiss Wright
Dominion Energy South Carolina, Inc.
Dominion Energy, Inc.
Duke Energy Corp.
Enercon Services
Energy Northwest
Energy Services, Inc.
Energy Services (Wolf Creek)
Framatome
GE-Vernova
LeonardoDRS
NPPD (Cooper)
Palo Verde
Paragon Engineering Services
PG&E (Diablo)
PSEG (Salem/Hope Creek)
Rolls Royce SMR
Sargent & Lundy Engineers
Southern Company
South Texas Project (STP)
Tennessee Valley Authority (TVA)
Vistra Corp. (Comanche Peak)
Westinghouse Electric Company, LLC
Xcel Energy

References

- Southern Nuclear's Digital Transformation with EPRI's Systems Engineering Framework Enhances Reliability and Safety, Saves Millions.
<https://www.epri.com/research/products/000000003002033671>
- Idaho National Labs- Plant Modernization Reports.
<https://lwrs.inl.gov/about/plant-modernization/plant-modernization-reports/>



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