



Commercial Grade Dedication Challenges

NRC Workshop

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Doug VanTassell
CEO
M: 704.904.3493
dvantassell@ParagonES.com



Paragon at a Glance

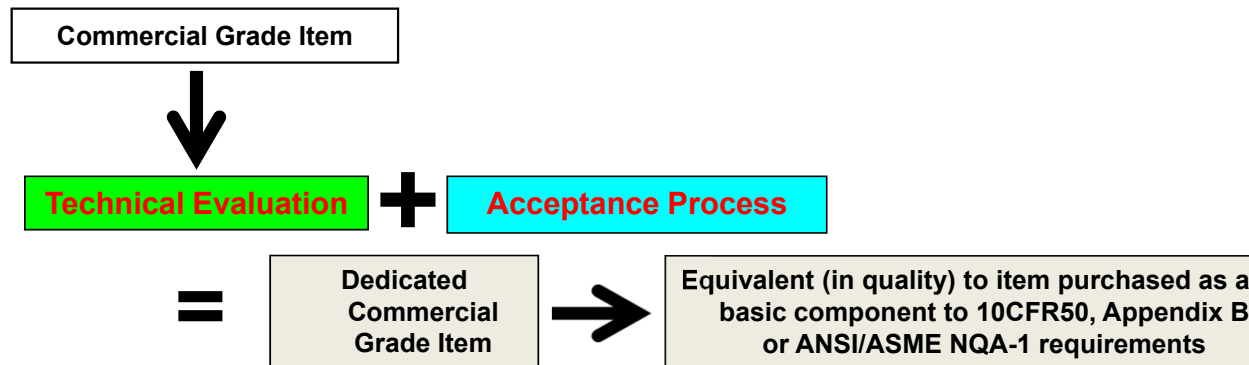


We Solve the Nuclear Industry's Cost and Replacement Challenges

Commercial Grade Dedication (CGD) Program

◁ Program Basis:

- 10 CFR Part 21, “Reporting of Defects and Noncompliance.”
- ASME NQA-1-2008/NQA-1a-2009, “Quality Assurance Requirements for Nuclear Facility Applications.”
- EPRI 3002002982, “Plant Engineering: Guideline for the Acceptance of Commercial-Grade Items in Nuclear Safety-Related Applications: Revision 1 to EPRI NP-5652 and TR-102260.”



Commercial Grade Dedication (CGD) Program

Technical Evaluations:

- Determine safety function
- Identify performance requirements
- Confirm commercial grade definition criteria
- Failure Modes and Effects Analysis (FMEA)
- Identify critical characteristics



◁ Acceptance Activities:

- Method 1 - Special tests and inspections
- Method 2 - Commercial-grade survey of supplier
- Method 3 - Source verification
- Method 4 - Acceptable supplier/item performance record



Commercial Grade Dedication (CGD) Program

◁ New EPRI Guidance Enhancements (EPRI 3002002982)



- Better documentation of basis for sampling plan selection
- Formal basis for tolerancing and dimensioning
- Improved FMEA and its documented basis
- Better documentation of active/passive safety function criteria
- Formal documented basis for each critical characteristics and acceptance criteria

Typical Items Paragon Dedicates

Printed Circuit
Boards

Power Supplies

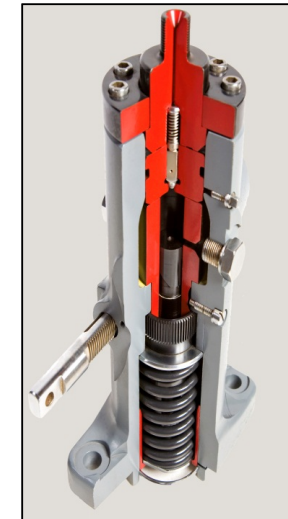
Breakers

Motor Control
Center Components

Pressure Gauges and
Switches

Electrical
Components

Mechanical
Components



Equipment Qualification

Seismic

EMI/RFI

Temperature/Humidity

Mechanical/Thermal Aging

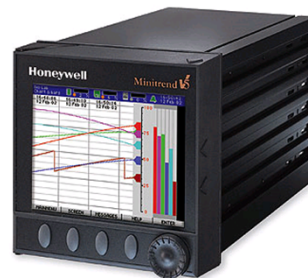
Radiation



Software Dedication

◁ Process Control Software:

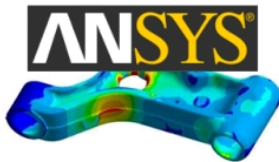
- Software in digital commercial-grade items (CGIs)
 - Operating (platform) software, application software, and software tools (compilers, assemblers, libraries)
 - Programmable/configurable/fixed firmware or logic embedded in digital CGIs
 - Software life cycles, built-in quality, cybersecurity considerations (from supplier perspective)



Software Dedication

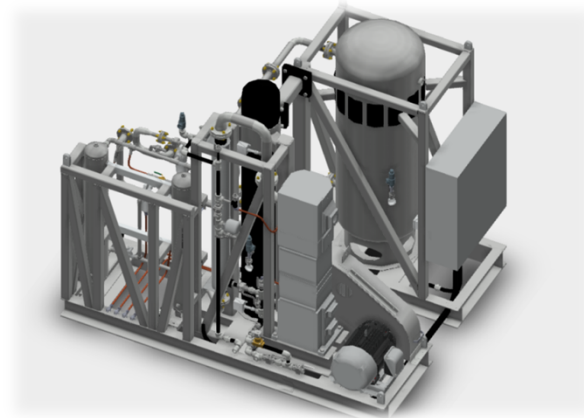
◁ Design & analysis computer programs

- Computer programs used to-
 - Facilitate design of a safety-related structure, system, or component (SSC)
 - Analyze how a safety-related SSC will function or withstand design conditions
 - Influence the design or use of an SSC in a way that could impact the SSC's ability to perform its designed safety functions
- Application examples
 - Tornado Missile Analysis software (TORMIS)



Commercial Grade Dedication (CGD) Projects

- ◁ One stop shop ability
- ◁ Commercial survey and source surveillance
- ◁ Project Management capabilities
- ◁ Control procurement processes
- ◁ Strong Quality oversight



Creating Efficiencies through Generic CGD's

- ◁ **Today:** Purchase Order Specific
 - [Eaton Breaker CGD for LaSalle](#)
- ◁ **Tomorrow:** Product Line Specific
 - Part families are prioritized through usage and demand
 - Tech Eval lives in the GDP, does not get re-invented
 - [Generic Eaton Breaker NIMS CGD](#) and
 - [Molded Case Circuit Breaker Generic Dedication Procedure](#) (GDP-210)



Cost Reduction Initiative

What are Today's Challenges

◁ Access to Design Information/Requirements

- Lack of Information from Utility
 - Design attributes
 - Safety function
 - Qualification requirements
 - Host component information (if required)
 - IP/Proprietary issues
 - Purchase orders have dated information, old specifications
- Lack of OEM information
 - Unwilling to provide adequate detail
 - Proprietary
 - Obsolescence; no longer supported
 - OEM Information stagnant



What are Today's Challenges (cont'd)

◁ Staying Competitive in Today's Market

- Increased Engineering/Testing hours
- Additional Testing Requirements
- Increased Documentation Requirements
- Many OEMs are now gone; Obsolescence
- Delivering the Nuclear Promise
- Utilities doing their own CGD vs Outsource



Case Study: TVA Medium Voltage Fuses

◁ Challenges

- Immediate plant operability concern
- Obsolete, Non-safety spares on hand
- Not UL listed or recognized

◁ Keys to Victory

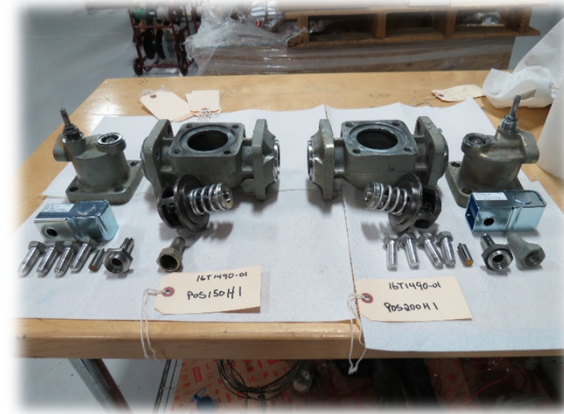
- Fuse dedication scope well understood by Paragon
 - Safety function defined
- Paragon immediately mobilized to KEMA to provide oversight
- “Whatever it takes” 24/7 approach to meet customer schedule



Case Study: TVA Solenoid Operated Valves

◁ Challenges

- Single point vulnerability
- Obsolete, old non-safety parts found
- Needed new soft goods, asbestos concerns
- Required dedication and seismic qualification



◁ Keys to Success

- Paragon valve and solenoid testing experience
- Limited safety function
- Key support from OEM even though obsolete

