

Technical Meeting on the Use of Commercial Grade Products and Services in Nuclear Power 19-22 April 2022



Kerri Kavanagh and Aaron Armstrong
Quality Assurance & Vendor Inspection Branch / Office of Nuclear Reactor Regulation



U.S. NRC's Perspective, Experience and Expectations related to the use of Commercial-Grade Products in the United States

2

Background

Industry guidance for acceptance of commercial-grade products was developed in the late 1980s.

In the late 1980s, the US nuclear industry issued supplemental guidance in the initial version, Revision 0 of EPRI NP-5652, to do the following:

- Provide clarifications in certain areas.
- Share lessons learned.
- Address industry and regulatory developments after the issuance of the original industry guidance.

In the late 1980s to early 1990s, the NRC performed a series of procurement inspections at licensees' facilities that identified weaknesses in licensees' procurement and dedication programs.

- Generic Letter (GL) 89-02, "Actions to Improve the Detection of Counterfeit and Fraudulently Marketed Products," (ADAMS Accession No. ML031140060) was issued in March 1989. This generic letter described the staffs' perspective on good practices in procurement and dedication and provided the NRC's conditional endorsement of an industry standard (EPRI NP-5652, Revision 0) on methods of commercial-grade procurement and dedication.
- Generic letter 91-05, "Licensee Commercial-Grade Procurement and Dedication Programs," (ADAMS Accession No. ML031140508) was issued in April 1991. This generic letter presented the staffs' positions regarding implementation of existing regulatory requirements, as contained in Appendix B to 10 CFR Part 50.



U.S. NRC's Perspective, Experience and Expectations related to the use of Commercial-Grade Products in the United States

3

Background

In September 2011, Commission paper SECY-11-0135, "Staff Plans to Develop the Regulatory Basis for Clarifying the Requirements in Title 10 of the *Code of Federal Regulations* Part 21, 'Reporting of Defects and Noncompliance'," (ADAMS Accession No. ML112430138) was issued.

- In SECY-11-0135, the staff indicated to the Commission a need for development of regulatory guides for dedication activities and the importance of the clarification and guidance.
- Rulemaking efforts for SECY-11-0135 were halted by the Commission due to budgetary constraints.

In September 2014, EPRI issued EPRI 3002002982, Revision 1 to EPRI NP-5652 and TR-102260 "Plant Engineering: Guideline for the Acceptance of Commercial-Grade Items in Nuclear Safety-Related Applications," (ADAMS Accession No. ML18199A161). The NRC determined that this latest EPRI dedication guidance is consistent with the existing NRC regulation and provides clarification identified in SECY-11-0135.

In June 2017, the NRC issued Regulatory Guide 1.164, "Dedication of Commercial-Grade Items for use in Nuclear Power Plants," (ADAMS Accession No. ML17041A206). The guidance endorses, with exceptions and clarifications, EPRI 3002002982, Revision 1 to EPRI NP-5652 and TR-102260.



U.S. NRC's Perspective, Experience and Expectations related to the use of Commercial-Grade Products in the United States

Perspective

Since the development of commercial-grade dedication (CGD) in the late 1980s and improvements made since then, CGD has provided the US nuclear industry the ability to effectively deal with parts obsolescence and replacement parts availability with a declining nuclear supply chain.

CGD has provided an acceptable approach for using NEI 14-05A, Revision 1, "Guidelines for the Use of Accreditation in Lieu of Commercial Grade Surveys for Procurement of Laboratory Calibration and Test Services," (ADAMS Accession No. ML20135H229) which allows the use of approved laboratory accreditation in lieu of performance of commercial-grade surveys. This CGD process is for the procurement of calibration and testing services performed by domestic and international laboratories.

The NRC is in the process of evaluating NEI 17-06, "Guidance on Using IEC 61508 SIL Certification to Support the Acceptance of Commercial Grade Digital Equipment for Nuclear Safety Related Applications," (ADAMS Accession No. ML19273A007) to allow licensees to use the Safety integrity level (SIL) certification process in lieu of performing commercial-grade surveys to evaluate the "dependability" critical characteristics as part CGD of digital devices.



U.S. NRC's Perspective, Experience and Expectations related to the use of Commercial-Grade Products in the United States

5

Experience

The NRC has noted some key areas that ensure the CGD process integrity.

Knowledge of the original components design and operational requirements.

Engineering involvement is vital in the identification, procurement, and acceptance of items to be dedicated and include, but not limited to, the following:

- Development of specifications to be used for the procurement of items to be dedicated.
- Determination of the critical characteristics of the selected items that are to be verified during product acceptance.
- Determination of specific testing requirements and the applicability to the selected items.
- Evaluation of test results by applicable subject matter experts.
- Assurance of the commercial supplier before procurement is important.



U.S. NRC's Perspective, Experience and Expectations related to the use of Commercial-Grade Products in the United States

6

Experience

Well defined purchase order requirements that are documented in the purchase orders.

Robust dedications activities provide a proactive layer of defense in the identification of and preclude the use of Counterfeit, Fraudulent, and Suspect Items (CFSIs).

CGD does provide reasonable assurance that the item selected for dedication will perform its intended safety function.

CGD of items is not an easy process and procuring components from a nuclear supplier should be the preferred procurement method.

CGD was not intended to be used for cost savings. Appropriate CGD of components may cost more than procuring the same components from a nuclear supplier.



U.S. NRC's Perspective, Experience and Expectations related to the use of Commercial-Grade Products in the United States

Expectations

CGD organizations have established adequate QA programs.

CGD organizations properly develop and implement a plan for CGD activities.

CGD organizations establish adequate controls to perform the technical evaluations for items or services to be dedicated. This includes the review of materials, parts, equipment, and processes that support the suitability of the items in their intended application.

CGD originations have adequate controls for the acceptance of a commercial grade items using source evaluation and selection, objective evidence of supplier quality, inspection at the supplier source, and examination of products upon delivery.

CGD is NOT always easier and should not be used for cost savings.

Robust CGD activities provide an additional proactive layer of defense in the identification and preclude the use of CFSIs.



Questions

8

