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Typical Format for Documenting Commercial-Grade Item Dedication Technical Evaluations

2015 TECHNICAL REPORT

Typical Format for Documenting Commercial-Grade Item Dedication Technical Evaluations

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All or a portion of the requirements of the EPRI Nuclear Quality Assurance Program apply to this product.

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ABSTRACT

This product includes an automated form and a simple Microsoft Word form that can be used to document the technical evaluation used to dedicate commercial-grade items for use in safety-related applications. The automated form includes features such as pull-down lists and can be saved as a document template.

The forms are designed to be used in conjunction with Electric Power Research Institute (EPRI) report 3002002982, *Guideline for the Acceptance of Commercial-Grade Items in Nuclear Safety-Related Applications: Revision 1 to EPRI NP-5652 and TR-102260*.

Keywords
Commercial grade
Dedication
Forms
Procurement engineering
Technical evaluation

EXECUTIVE SUMMARY

The forms embedded in this report are intended to provide one example of a basic format for documenting commercial-grade item technical evaluations that can be customized by dedicating entities. These forms do not include provisions for other aspects of a complete technical evaluation—a safety classification, equivalency evaluation, and so forth. More information on the technical evaluation of replacement items can be found in Electric Power Research Institute (EPRI) report 1008256, *Guidelines for the Technical Evaluation of Replacement Items in Nuclear Power Plants (Revision 1).*

The forms can also be used to identify potential gaps or weaknesses in existing methods of documenting commercial-grade item dedication technical evaluations by comparing the information requested in the forms to information in existing commercial-grade dedication forms or databases.

Basic instructions for completing the form are included in Section 2 of the report. Where applicable, the form refers to sections of EPRI report 3002002982, *Guideline for the Acceptance of Commercial-Grade Items in Nuclear Safety-Related Applications: Revision 1 to EPRI NP-5652 and TR-102260*, that include additional information.

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1
INTRODUCTION

1.1 Objective

In September 2014, the Electric Power Research Institute (EPRI) published *Guideline for the Acceptance of Commercial-Grade Items in Nuclear Safety-Related Applications: Revision 1 to EPRI NP-5652 and TR-102260* (3002002982) [1]. 3002002982 include examples of typical commercial-grade dedication forms.

In response to requests received from users of 3002002982, this report provides the means to access typical dedication forms and an associated independent reviewer checklist in a Microsoft Word format.

1.2 Applicability of Guidance

The forms included in this report are applicable to any dedicating entity. However, the forms and reviewer checklist are intended to be an example of tools that can be used to promote complete and consistent documentation of the technical evaluation used to dedicate commercial-grade items.

There is no single or standard format for documenting a technical evaluation for commercial-grade item dedication. It is acceptable for different organizations to document technical evaluations in different ways, and the format may vary depending on the type of organization. In some cases, the various elements of a commercial-grade item technical evaluation may not be included in the same document.

However, the forms in this report are intended to provide one example of a basic format, which can be customized by dedicating entities, for documenting technical evaluations for commercial-grade items. These forms do not include provisions for other aspects of a complete technical evaluation—a safety classification, equivalency evaluation, and so forth. More information on the technical evaluation of replacement items can be found in EPRI 1008256 [2].

Where applicable, the form refers to sections of EPRI's *Guideline for the Acceptance of Commercial-Grade Items in Nuclear Safety-Related Applications: Revision 1 to EPRI NP-5652 and TR-102260* [1] that include additional information.

1.3 Contents of This Report

The contents of this report are depicted in Figure 1-1.

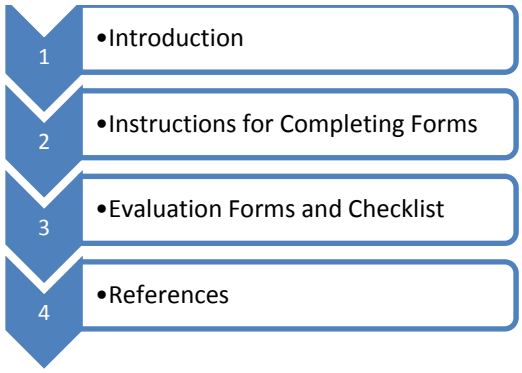

Figure 1-1
Report Contents

Section 2 includes a set of basic instructions for completing the forms included in Section 2.

Section 3 lists documents that can be used to download and save:

- A simple version of the form in a Microsoft Word document
- An automated version of the form in a Microsoft Word document template
- A commercial-grade dedication review checklist that can be used by independent technical reviewers

Section 4 contains the references that are used in this report.

2
INSTRUCTIONS FOR COMPLETING TYPICAL COMMERCIAL-GRADE ITEM DEDICATION FORMS

2.1 Section A, Item Description

The information to include in each of the data fields of Section A of the commercial-grade item dedication form is as follows:

- **Evaluation number and revision**. Enter the internal tracking number and revision level (as applicable) used to identify the evaluation.
- **Inventory control number**. Provide the unique code used to identify the item in the inventory management system (for example, stock code, catalog identifier, material number, and stock-keeping unit).
- **Noun identifier**. Specify the name of the item, typically presented in a noun-adjective-additional-information format; for example, "pipe, carbon steel, Schedule 80, 4-in. (100.8-mm) diameter, 20-ft (6.1-m) long."
- **Manufacturer name**. Enter the name of the entity that manufactures the item.
- **Manufacturer model/part/catalog number(s)**. Provide a product identifier, such as the manufacturer's or supplier's assigned identifier for an item. The part number (as referred to in this report) can also include identifiers such as model number, material type, grade, or catalog reference number.

2.2 Section B, End Use/Parent/Host Equipment Information

Either Section B or Section C of the form should be completed for a commercial-grade item dedication technical evaluation. Section B is provided to capture information about the end use, parent, or host equipment. Section B would typically be used when the dedicating entity knows the parent/host equipment and end uses for the item being dedicated or when the dedicating entity has a design document or other information that clearly defines the intended scope of use. An example might be dedicating an item to meet the requirements of a plant design specification.

Recognizing that dedicating entities do not always have information about the specific end-use application of products they dedicate, the standard form also provides Section C to capture a bounded scope of use on which a dedication may be based. Section C would typically be used when the dedicating entity wants to have safety-related items available for use but does not have information about the specific end-use applications or does not have access to design documents or other information that clearly define all of the possible uses for the safety-related items. An

example might be dedicating an item based on all applicable design requirements and uses for the item. Such items might include discrete electronic devices, such as capacitors or resistors. Section C might also be used when dedication is being used to establish and document that an item meets all the requirements of an industry standard.

The information to include in each of the data fields of Section B of the form is as follows:

- **Equipment ID (tag) numbers or description of item usage**. Identify the host equipment (for example, the tag number(s)) for which the item is intended. When the item is used in numerous applications, such as a commodity item, describe the intended end-use applications. For example, "This cap screw is used in accordance with piping specifications ABC and XYZ as a pressure-retaining bolting component in safety-related piping system flanged connections."
- **Parent component/host description**. Briefly describe the parent/host components/systems.
- **Functional safety class of component/host**. Identify the component/host as safety-related or non-safety-related. If the component/host is non-safety-related, the item does not require dedication, and the dedication process does not apply. If the component/host is safety-related, continue with the commercial-grade item dedication technical evaluation.
- **Basis/source**. List the basis or source of the component/host safety classification. Typical sources might include previous safety classification evaluations; system descriptions; equipment lists; quality assurance level lists (Q-lists); critical structures, systems, and components (CSSC) lists; and so forth.
- **Identification of parent component/host equipment functions**. Provide information on the actual functions of the component within the system in which it is installed. Information should include functional requirements during normal operations as well as during and following a design basis accident. For each basic safety function (basic safety functions are listed in Table 5-3 of 3002002982) [1], include the functional mode (active or passive) and a brief description as required. For example, a relay could have both a passive safety function (maintaining 1E circuit integrity) and an active safety function (closing to prevent damage to the 1E circuit). Both safety functional classifications would be listed.
- **Parent component/host equipment is (check all that apply)**. This section further defines the technical requirements of the parent component.

2.3 Section C, Bounded Scope of Use

Note: This section is used only when the specific end use of the item is unknown.

Bounding the scope requires clearly defining the postulated safety functions on which the commercial-grade item dedication technical evaluation and acceptance plan are based.

The dedicating entity may decide to dedicate the item based on all applicable design criteria and establish in the dedication that the item meets all design requirements and is thereby capable of performing any function in any application.

The information to include in each of the data fields of Section C of the form is as follows:

- **Is the parent/host a commodity or standard item designed and constructed in accordance with an industry standard?** If the answer is "yes," list all of the known industry standards that apply.
- **List functions and/or applications considered when completing this evaluation**. This information provides the basis for bounding the scope for which this evaluation can be used. The evaluation can be used only for those functions and applications considered, documented, and evaluated in this technical evaluation.
- **Equipment qualification considerations/limitations (check all that apply)**. This section further defines the technical requirements of the parent component.

2.4 Section D, Item Information

The information to include in each of the data fields of Section D of the form is as follows:

- **Item description**. Describe the item being evaluated for purchase/acceptance. (It could be the parent component, a specific piece-part of the parent component, or a commodity item.)
- **Functional safety class of the item**. Identify the item as safety-related or non-safety-related. If the item is non-safety-related, the item does not require dedication; document the basis/source of the determination (see the following), and exit this process. If the item is safety-related, document the basis/source of the determination (see the following), and continue with the technical evaluation.
- **Basis/source**. The basis or source of the item's safety classification is to be listed here. **Note**: If the functional classification of the item is non-safety-related, exit this process, and procure the item as non-safety-related.
- **Identification of item functions**. Provide information on the actual safety functions of the item within the component and the system in which it is installed. Information should include functional requirements during normal operations as well as during and following a design basis accident. For each basic safety function (basic safety functions are listed in Table 5-3 of 3002002982) [1], include the functional mode (active or passive) and a brief description as required. For example, a relay could have both a passive safety function (maintaining 1E circuit integrity) and an active safety function (closing to prevent damage to the 1E circuit). Both safety functional modes would be listed in this section.
- **Item is (check all that apply)**. This section further defines the technical requirements of the item.

2.5 Section E, Eligibility for Dedication

Does the item meet the applicable regulatory definition of a commercial-grade item? Answer "yes" or "no." If the answer is no, this item cannot be dedicated.

2.6 Section F, Failure Modes/Mechanisms and Effects Analysis

The information to include in each of the data fields of Section F is as follows:

- **Credible failure mode/mechanism**. The credible failure modes/mechanisms associated with the safety functions of the item in its operating environment are considered in the selection of critical characteristics. Note that there may be more than one failure mode/mechanism. Select all that apply from the list included in Table 5-4 on page 5-4 of EPRI 3002002982 [1]; also, consider the information contained in Section 3.3 of EPRI report 1008256 [2].
- **Effects on the system/component function**. The effects of each credible failure mode/mechanism of the item on its safety functions are considered in the selection of critical characteristics. For each credible failure mode/mechanism previously listed, document its effect on the safety functions of the item in its operating environment (for both normal and postulated accidents).
- **Basis for selection of credible failure modes/mechanisms**. Document a basis statement for the selection of each credible failure mode/mechanism. If a failure modes and effects analysis is not performed, a basis should be provided.

2.7 Section G, Operating Experience/Historical Performance Information

Document the operating experience reviewed to identify information about the quality of the item. Examples of operating experience sources of information can be internal and external and may include corrective action programs, industry databases, customer feedback, generic regulatory communications, and so forth.

2.8 Section H, Identification Attributes

Verification of identification attributes, such as those identified in Table 6-1 of 3002002982 [1], provides preliminary assurance that the item received is correct. In addition, changes in identifiers, such as the part and model number, often provide an indication of a design change and prompt further evaluation to determine if physical changes to the item affect its ability to perform its intended safety functions. Document appropriate identification attributes, a description of the inspection to be performed, and the acceptance criteria for each identification attribute listed.

2.9 Section I, Critical Characteristics

Document the appropriate physical (see Table 6-2 of 3002002982) [1] and performance (see Table 6-3 of 3002002982) [1] characteristics. For digital equipment, dependability characteristics (see Table 6-4 of 3002002982) [1] should also be considered.

Document the acceptance method (or group of acceptance methods) selected to verify each critical characteristic (the acceptance methods are listed in Table 5-2 of 3002002982) [1]. Provide a description of the acceptance activity and the acceptance criteria that must be met.

Include a description of the inspection or test, the type of test equipment (as appropriate), and the sampling plan (as applicable). Typical sampling plan options are 100%, normal (nondestructive), normal (destructive), reduced (nondestructive), reduced (destructive), tightened (nondestructive), and tightened (destructive). See EPRI report TR-017218-R1 [3] for information on selection of sampling plans.

The information to include in the data fields of Section I of the form is as follows:

- **Description of sampling plan**. Provide additional information as necessary to describe the sampling plan.
- **Safety functions supported/basis for selection of critical characteristics/acceptance criteria**. Describe how verification of the critical characteristics selected will provide reasonable assurance that the item will be capable of performing its safety functions. The basis should include considerations for maintaining seismic and environmental qualifications when applicable.
- **Basis for selection of sampling plans**. When sampling is used, document the sampling plan selected for each critical characteristic and the basis/factors considered when selecting the sampling plan.

2.10 Section J, References

List reference documents/sources used in the development of the commercial-grade item dedication technical evaluation.

2.11 Section K, Review and Approval

Review and approval should be performed and documented in accordance with the dedicating entity’s procedures.

3
ATTACHED EVALUATION FORMS

Microsoft Word versions of commercial-grade technical evaluation forms are attached in this document. The Word files can be printed separately.

See the attached Word documents:

3.1 Simple Version of Typical Commercial-Grade Evaluation Forms

3.2 Automated Version of Typical Commercial-Grade Evaluation Forms

3.3 Typical Commercial-Grade Dedication Review Checklist

4
REFERENCES

1. *Guideline for the Utilization of Commercial Grade Items in Nuclear Safety Related Applications: Revision 1 to EPRI NP-5652 and TR-102260(NCIG-07)*. EPRI, Palo Alto, CA: 2014. 3002002982.
2. *Guidelines for the Technical Evaluation of Replacement Items in Nuclear Power Plants (Revision 1)*. EPRI, Palo Alto, CA: 2006. 1008256.
3. *Guideline for Sampling in the Commercial-Grade Item Acceptance Process*. EPRI, Palo Alto, CA: 1999. TR-017218-R1.

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