System Development and Life-Cycle Management (SDLCM) Methodology

Procedures, Standards, and Forms, Version 1.3

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Foreword

Nuclear Regulatory Commission (NRC) Management Directive 2.5, “Application Systems Life-Cycle Management,” establishes the policies for applications systems life-cycle management. The System Development and Life-Cycle Management (SDLCM) Methodology implements Directive 2.5 by providing life-cycle structure and guidance to NRC projects.

The SDLCM Methodology comprises seven components:

1. Define Initial Project Requirements
2. Acquire Support Resources
3. Design the Solution
4. Engineer the Solution
5. Deploy the Solution
6. Service the Solution
7. Decommission the Solution

The methodology is *not* itself a document or a set of documents. It is *the approach to doing business* at NRC, and it is described by a set of documents, including but not limited to the following:

- *SDLCM Methodology Handbook*
- *SDLCM Methodology Procedures, Standards, and Forms*
- *SDLCM Methodology Tool Inventory*
- *SDLCM Methodology Overview Training*

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Introduction

Overview

This volume of procedures, standards, and forms is an important part of the documentation set describing the Nuclear Regulatory Commission's (NRC's) System Development and Life-Cycle Management (SDLCM) Methodology.

The SDLCM Methodology implements the management policy described in NRC Management Directive 2.5, "Application Systems Life-Cycle Management." NRC's SDLCM Methodology applies to, and must be followed by, all NRC employees and contractors involved in any aspect of application system development or life-cycle management.

The *SDLCM Methodology Handbook,* which is a companion document to this volume, provides the primary description of the SDLCM Methodology, its seven components, and the activities that must be performed within each of the components.

Using Procedures, Standards, and Forms

Each of the seven components of the methodology comprises a collection of *activities*. As suggested by Figure 1, the activities are not necessarily performed sequentially. Some of the activities may be performed in parallel as illustrated by the two separate paths branching from the activity shown at the top of the figure. The activities in the left branch illustrate that some iteration may be required. The activity on the lower right of the figure is performed optionally depending on some characteristic of a particular project.

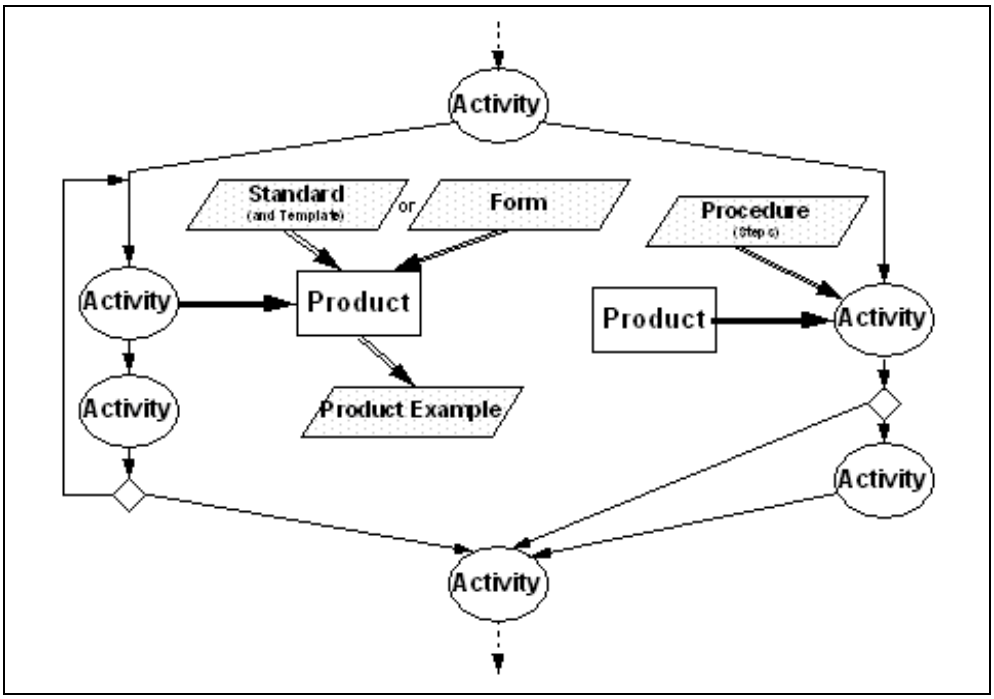

Figure 1. Relationship between Activities and Products

A *procedure* is a written description of the roles, responsibilities, and steps required for performing a complex activity or a subset of an activity. Within a procedure, *steps* are performed sequentially. Each SDLCM Methodology procedure is identified by the prefix "P–" followed by a four digit number. If an activity is described completely in the *SDLCM Methodology Handbook* or in a companion guidebook, then a corresponding procedure may not be provided.

Procedures provide the details of a process. They answer questions such as:

- "What are the steps for performing unit test?"
- "How does one conduct a peer review?"
- "What does a configuration control board do?"

A *product* is software or associated information created, modified, or incorporated to satisfy the project requirements. Examples include plans, requirements, design, code, databases, test information, and manuals. A product is an output of an activity and may be input to a subsequent activity.

A *standard* is a written set of criteria used to develop and evaluate a product or to provide and evaluate a service. Standards answer questions such as:

- "What are the form and content of a Project Charter?"
- "What is a context diagram?"
- "What is included in a software engineering notebook?"

The standards in this volume fall into two categories. A product standard (for example, the standard for a Project Action Plan) includes an annotated outline of the product. A non-product standard (for example, the standard for data models) documents a common form or approach (data models, for example, are required in several product standards). For some product standards, a word processor *template* is provided to facilitate the production of a product. Each SDLCM Methodology standard is identified by the prefix "S–" followed by a four digit number.

A *form*, rather than a product standard, is provided when the resulting product can be produced simply by filling in a set of blanks or completing a set of questions. Each SDLCM Methodology form is identified by the prefix "F–" followed by a four digit number.

A *product example* is an instance of a product developed by members of a project team using a standard or form. Representative products are provided as examples to make it easier for future project teams to satisfy the product requirements.

The specific project products required by this methodology are identified in the *SDLCM Methodology Handbook*. Product examples are maintained in the system documentation library.

Why are Procedures and Standards Needed?

Adherence to procedures and standards yields improved product quality, higher productivity, and portability of personnel. Product quality improves because everybody is using the best approach known at the present time. Productivity improves simply because nobody has to waste time deciding what to put in a document outline or developing an inspection form. Personnel become portable from one project to another because all projects within the NRC follow the same standards.

Tailoring

The procedures, standards, and forms are designed to support the development and life-cycle management of application systems of all sizes and complexity. Consequently, some of the standards, for example, may offer more support than is required for a development effort of small size or short duration. Conversely, some may not support the more complex needs of a major development effort.

This methodology is expected to be tailored to suit the specific needs of each project. The *SDLCM Methodology Handbook* discusses tailoring. Form F–2010 may be used to request a deviation or waiver from any requirement that does not apply to a specific project.

Contents of This Volume

For the convenience of the users of the SDLCM Methodology, the procedures, standards, and forms have been numbered and grouped into related management and technical process areas as defined by SDLCM Methodology Standard S–9055 (SDLCM Methodology Document Numbering) and reflected by the Table of Contents. Experience has proved that such an ordering makes the procedures, standards, and forms easier to locate and apply. Most standards are used in more than one component of the methodology; hence, the ordering by process area tends to be more logical and easier for project team members to identify.

The companion *SDLCM Methodology Handbook* describes the use of the procedures, standards, and forms in the context of the seven components of the methodology.

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