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N286.10-16

Configuration management for high energy reactor facilities

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CSA Group

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N286.10-16
September 2016

Title: *Configuration management for high energy reactor facilities*

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N286.10-16

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Published in September 2016 by CSA Group
A not-for-profit private sector organization
178 Rexdale Boulevard, Toronto, Ontario, Canada M9W 1R3

*To purchase standards and related publications, visit our Online Store at **shop.csa.ca***
or call toll-free 1-800-463-6727 or 416-747-4044.

ISBN 978-1-4883-0457-6

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Preface

This is the first edition of CSA N286.10, *Configuration management for high energy reactor facilities.*

This Standard provides requirements and guidance to be applied for the development and implementation of configuration management at high energy reactor facilities so that consistency between design requirements (including safety analysis), physical and operational configuration, and configuration information (e.g., operating procedures or drawings) can be achieved and maintained.

Users of this Standard are reminded that civilian nuclear facilities in Canada are subject to the provisions of the Canadian *Nuclear Safety and Control Act* and Regulations. The Canadian Nuclear Safety Commission (CNSC) can therefore impose requirements additional to those specified in this Standard.

The CSA N-Series Standards provides an interlinked set of requirements for the management of high energy reactor facilities and activities. The CSA N286 Standard provides overall direction to management to develop and implement sound management practices and controls, while the other CSA nuclear Standards provide technical requirements and guidance that support the management system.

This Standard works in harmony with CSA N286 and does not duplicate the generic requirements of CSA N286; however, it provides more specific direction for certain requirements.

ANSI/NIRMA CM 1.0, *Guidelines for Configuration Management of Nuclear Facilities,* was used as the seed document for the preparation of this Standard, with the permission of the Nuclear Information & Records Management Association (NIRMA).

This Standard was prepared by the Subcommittee on Configuration Management for High Energy Reactor Facilities, under the jurisdiction of the Technical Committee on Management Systems for Nuclear Facilities and the Strategic Steering Committee on Nuclear Standards, and has been formally approved by the Technical Committee.

Notes:

1) *Use of the singular does not exclude the plural (and vice versa) when the sense allows.*

2) *Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users of the Standard to judge its suitability for their particular purpose.*

3) *This Standard was developed by consensus, which is defined by* CSA Policy governing standardization — Code of good practice for standardization *as "substantial agreement. Consensus implies much more than a simple majority, but not necessarily unanimity". It is consistent with this definition that a member may be included in the Technical Committee list and yet not be in full agreement with all clauses of this Standard.*

4) *To submit a request for interpretation of this Standard, please send the following information to inquiries@csagroup.org and include "Request for interpretation" in the subject line:*

a) *define the problem, making reference to the specific clause, and, where appropriate, include an illustrative sketch;*

b) *provide an explanation of circumstances surrounding the actual field condition; and*

c) *where possible, phrase the request in such a way that a specific "yes" or "no" answer will address the issue.*

Committee interpretations are processed in accordance with the CSA Directives and guidelines governing standardization *and are available on the* Current Standards Activities page *at standardsactivities.csa.ca.*

5) *This Standard is subject to a review within five years from the date of publication. Suggestions for its improvement will be referred to the appropriate committee. To submit a proposal for change, please send the following information to inquiries@csagroup.org and include "Proposal for change" in the subject line:*

a) *Standard designation (number);*

b) *relevant clause, table, and/or figure number;*
c) *wording of the proposed change; and*
d) *rationale for the change.*

N286.10-16
Configuration management for high energy reactor facilities

0 Introduction

0.1 Background

There has been a recognized need for standardized processes and guidance to enhance the understanding of configuration management at high energy reactor facilities. This Standard was developed to provide a clear picture of what is required from the beginning of a new build project, during planning and implementation of refurbishment activities, and during operation. For successful refurbishment, the planning is based on actual plant conditions and as-built information. Lastly, this Standard provides a consistent basis against which to assess configuration management performance.

This Standard has been written with the expectation that users will follow a graded approach in the application of the requirements to better suit their particular facility. This enables effective implementation and maintenance of configuration at the various facilities.

While this Standard applies to computer software in the sense that software is part of the information under configuration control, users are directed to other CSA Group standards specific to software quality assurance, as they contain detailed requirements on computer software configuration.

Note: *Refer to CSA N286.7 for details on quality assurance of analytical, scientific, and design computer programs.*

0.2 Purpose

0.2.1

Configuration management (CM)

a) establishes consistency between design requirements, physical and operational configuration, and configuration information (see Figure 1);
b) maintains CM element consistency from initial conception to cessation of operations;
c) maintains alignment of safety analysis with plant configuration;
d) facilitates safe operations; and
e) supports changes.

Note: *CM activities help to*

a) *eliminate re-work when implementing facility configuration changes;*
b) *facilitate assessments;*
c) *maintain compliance to requirements;*
d) *avoid delays in maintenance activities;*
e) *support business continuity (e.g., during abnormal operation, beyond design basis support); and*
f) *facilitate life-cycle management programs.*

0.2.2

CM supports facility design, procurement, construction/installation, commissioning, turnover, and operation.

0.3 Integration with the management system

0.3.1

CSA N286 defines the requirements to implement and maintain all the necessary controls required to support the CM elements (see Figure 1).

0.3.2

This Standard does not duplicate the generic management system requirements as defined in CSA N286; however, this Standard provides more specific direction for those generic requirements as they apply to CM.

0.3.3

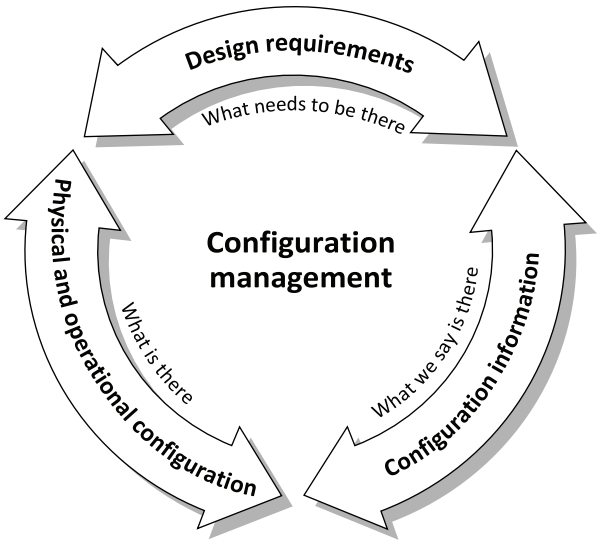
This Standard does not require CM to be a separate, stand-alone program; thus, this Standard relies on processes found in the management system for implementation (e.g., graded approach, assessment, problem identification and resolution, training).

0.4 Configuration management model

0.4.1

The CM elements are depicted in Figure 1. Configuration is achieved and maintained when consistency exists between design requirements, physical and operational configuration, and configuration information.

Figure 1
Configuration management model
(See Clauses 0.2.1, 0.3.1, 0.4.1, and 8.2.1.)



0.4.2

From initial conception and until cessation of operations, the CM focus will be on ensuring that the data generated during design preparation, construction, and commissioning reflects the design basis and

specified requirements, and are consistently kept current through the design, as-built information, and field changes.

0.5 Division of the Standard

This Standard is divided into the following clauses:

a) application of this Standard (see Clause 4);
b) program management (see Clause 5);
c) design requirements (see Clause 6);
d) configuration information (see Clause 7);
e) physical and operational configuration (see Clause 8);
f) maintaining configuration (see Clause 9);
g) assessment (see Clause 10); and
h) training (see Clause 11).

1 Scope

1.1 General

1.1.1

This Standard provides requirements and guidance for managing configuration at high energy reactor facilities (hereinafter referred to as "facility") from initial conception to cessation of operations.

Notes:

1) *High energy reactor facilities is defined in Clause 7.1 of CSA N286.*
2) *This Standard provides requirements and guidance supplementing the management system requirements found in CSA N286.*
3) *This Standard was written in a way such that it may be adopted by other nuclear facilities.*

1.1.2

This Standard does not apply to decommissioning.

1.2 Terminology

1.2.1

In this Standard, "shall" is used to express a requirement, i.e., a provision that the user is obliged to satisfy in order to comply with the Standard; "should" is used to express a recommendation or that which is advised but not required; and "may" is used to express an option or that which is permissible within the limits of the Standard.

Notes accompanying clauses do not include requirements or alternative requirements; the purpose of a note accompanying a clause is to separate from the text explanatory or informative material.

Notes to tables and figures are considered part of the table or figure and may be written as requirements.

Annexes are designated normative (mandatory) or informative (non-mandatory) to define their application.

1.2.2

In this Standard, “shall be considered” or “shall consider” means that the user evaluates the impact and documents any decisions.

Note: *Documentation should include rationale for decisions.*

2 Reference publications

This Standard refers to the following publications, and where such reference is made, it shall be to the edition listed below.

Note: *See also Annex A for additional relevant publications.*

CSA Group

N286-12
Management system requirements for nuclear facilities

N286.7-16
Quality assurance of analytical, scientific, and design computer programs

ASME (American Society of Mechanical Engineers)

NQA-1-2015
Quality Assurance Requirements for Nuclear Facility Applications

CNSC (Canadian Nuclear Safety Commission)

RD/GD-210
Maintenance Programs for Nuclear Power Plants

Government of Canada

Nuclear Safety and Control Act, SC 1997, C.9, and Regulations

NIRMA (Nuclear Information & Records Management Association)

ANSI/NIRMA CM 1.0-2007
Guidelines for Configuration Management of Nuclear Facilities

3 Definitions and abbreviations

3.1 Definitions

The following definitions shall apply in this Standard:

As-built information — documentation or data that reflects the actual configuration of the SSC.

Business — an organizational entity with accountability to implement some or all of the requirements of this Standard.

Configuration deviation — an inconsistency between any of the three elements: design requirements, physical and operational configuration, and configuration information.

