CAN/CSA-N287.1-93 – General Requirements for Concrete Containment Structures for CANDU Nuclear Power Plants

This document provides an overview of the requirements of *Welding Requirements CSA-N287.1 – General Requirements for Concrete Containment Structures for CANDU Nuclear Power Plants* with respect to welding. It is designed to provide general requirements used in the design, construction, testing, and commissioning of concrete containment structures designated as class containment and is directed to the owners, designers, manufacturers, fabricators, and constructors of the concrete components and parts for CANDU nuclear power plants.

This document is only for general guidance purposes; reference to the full text of CSA N287.1 should be made. For further information, please contact the CWB at 1-800-844-6790 or info@cwbgroup.org.

Introduction

Welding is a key joining method used in the fabrication of steel structures and concrete containment structures. To ensure welds of the highest quality and the safety of both the users of CANDU power plants and the general public, CSA Standard N287.1 provides specific requirements around the design, construction, testing, and commissioning of concrete containment structures, with awareness that the CANDU nuclear plants are used by people.

Welded Fabrication

CSA N287.1 provides the following requirements:

4.4 Fabricator's Responsibility
The fabricator shall fabricate and, where applicable, design the parts in accordance with the drawings and specifications and in conformance with the N287 Series of CSA Standards.

CSA Standard N287.4 requires all fabricators conducting welding of reinforcing bars to be certified to CSA Standard W186 and all fabricators conducting welding on structural components and metallic liners to be certified to CSA Standard W47.1. Also CSA Standard N287.4 states that stud welding shall comply with the requirements of CSA Standard W59 and the its additional requirements.

An organization meeting the requirements of CSA Standard W47.1 and / or CSA Standard W186 will have qualified welders, accepted welding procedures and accepted supervisory / engineering personnel. All elements of the welding operation will be independently verified by the Canadian Welding Bureau on an on-going basis.

CSA Standard W59 requires that contractors performing work under this standard be certified under the requirements of CSA Standard W47.1 unless the Engineer of record approves the contractor for the work to be undertaken. CSA Standard W47.1 provides requirements for the qualification of welders and welding operators, welding procedures and welding supervisory and engineering personnel.

Please note that there are no domestic or international equivalents to CSA Standard W47.1 and / or CSA Standard W186. Other national systems, such as that of the American Welding Society (AWS) do not include key concepts such as independent and on-going verification and welding supervisors/engineers. The CWB strongly cautions the reader around accepting substitutions; doing so may place public safety at risk.

For a listing of all organizations that currently meet the requirements of CSA Standard W186 and / or CSA Standard W47.1 please see *www.cwbgroup.org*.

Welding Inspection

7.3.3 Welding Inspectors
Welding inspectors shall be qualified to the requirements of Clause 7.3 of CSA Standard W178.2.

CSA Standard W186 and CSA Standard W59 require that all welds be visually inspected. In addition, when required by contract weld inspection must be completed by certified welding inspectors or a welding inspection organization following the requirements of CSA Standard W178.2 or CSA Standard W178.1 respectively. It also requires that CSA Standard W186 and CSA Standard W59 be followed for the acceptance criteria for all welds. It should be noted that CSA Standard W178.2 has individual "product categories" that inspectors may qualify to, including one for CSA Standard W59.

For a listing of all organizations and individuals who currently meet the requirements of CSA Standard W178.1 and CSA Standard W178.2, please see *www.cwbgroup.org* .