

RESEARCHES FOR THE DEVELOPMENT OF A DEVICE FOR THE DECOMMISSIONING OF THE HORIZONTAL FUEL CHANNELS IN THE CANDU 6 NUCLEAR REACTOR. FUEL CHANNEL REFERENCES

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Abstract: *The aim of this study is to identify the fuel channel components and the reference plans based on which is made the installation into calandria of CANDU 6 nuclear reactor. The CANDU 6 is a 740 MW pressure tube reactor designed by Atomic Energy of Canada Limited (AECL) to provide safe and reliable nuclear power. It is an evolution of the previous CANDU reactor, and it is designed to be licensable internationally by ensuring its compliance with the latest Canadian nuclear regulations and the fundamental safety principles of the International Atomic Energy Agency (IAEA) Safety Standards. The CANDU reactor design is based on the experience derived from preceding CANDU reactors and virtually every design feature of the latest CANDU reactor is identical to, or it is an evolutionary improvement of, an earlier proven design. The design of the CANDU fuel channel is accordingly the result of continuing intensive engineering development of its major components. The reactor assembly of the CANDU 6 nuclear reactor consists of the horizontal, cylindrical, low-pressure calandria and the end-shield assembly. This enclosed assembly contains the heavy water moderator, the 380 fuel channels assemblies and the reactivity mechanisms. The fuel channels are one of the major distinguishing features of a CANDU reactor and their reliability is crucial to the performance of the reactor. Each fuel channel consists of four major components: the pressure tube, the calandria tube, the annulus spacers and the end fittings. Fuel bundles are enclosed in the fuel channels that pass through the calandria and the end-shield assembly. The fuel channel is designed to ensure a radiation exposure protection of workers and public, during the reactor operation. The fuel channels are assembled and installed into the calandria vessel at the reactor site following installation of the calandria. The fuel channel assembly is made according with the specific requirements of reference planes definition, reference planes measurements, tools and equipments, installation procedures and the quality assurance program. Defining reference plans, measurements reported to reference plans and installation procedures to a new fuel channel in the calandria CANDU nuclear reactor comply the requirements described in the AECL (Atomic Energy of Canada Limited) specified documents.*

Keywords: *Candu reactor, plane reference, calandria tube, fuel channel, pressure tube*

1. General Introduction

The nuclear reactors are designed and manufactured with respect of the specific requirements of codes and standards for the manufacture of components, equipment and systems required for the construction and operation of CANDU nuclear power plant.

Defining reference plans, measurements reported to reference plans and install operations to a new fuel channel in the calandria CANDU nuclear reactor comply the requirements described in the AECL (Atomic Energy of Canada Limited) specified documents. Registration documents, check documents and relating reports to the