Radiation Protection Supervisors Certification in Brazil

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Abstract. In order to accomplish its legal assignments CNEN certifies the qualification of radiation protection supervisors. The current certification process is presented and discussed in this paper. This paper discusses the main points of the certification process including: knowledge tests, stake holder´s communication, standards, supervisor responsibilities and profiles. The importance of safety certification of nuclear facilities and radiation protection of public individuals and workers are also discussed. Taking into account the characteristics of the Brazilian Nuclear program, the future improvements and goals in the certification process is also presented.

Keywords: certification; qualification; radiation protection; supervisors; regulatory body, standards .

1. Introduction

One of the legal assignments of the National Nuclear Energy Commission - CNEN is the certification of qualification of professionals which work in the nuclear area. Certified CNEN Brazilian professionals are the following: - Nuclear Reactors Operators; - Radiation Protection Supervisors; - Industrial Radiography Operators and Industrial Radiography Technicians. The radiation protection supervisor process certification follows the CNEN Standard CNEN NN 3.03 [1].

The main objective of the radiation protection supervisor certification is to assure that these professionals have enough skills and knowledge to develop their tasks in accordance with CNEN Standards and the radiation protection good practices. This objective is in accordance with ABNT NBR ISO/ IEC 17024:2004 which defines "Certification - all the activities by which a certification body establishes that a person fulfils specified competence requirements, including application, evaluation, decision on certification, surveillance, use of certificates and a logos/marks" [2]. In order to accomplish these objectives "the certification body shall define policies and procedures for granting, maintaining; renewing, expanding and reducing the scope of the desired certification, and suspending or withdrawing the certification"[2].

The professional certification is generally an activity that occurs in a voluntary way. The demand for certification comes from the market to assure product and service quality. On the other hand, when the activity is regulated by safety requirements, the certification is compulsory. The professional certification in the Brazilian nuclear area is compulsory.

In CNEN the radiation protection supervisor certification process is overviewed by a committee. This committee is called The Radiation Protection Supervisor Qualification Certification Committee and which evaluates the conformity of the syllabus for various kinds of examinations as well as defining the policies of the certification process. Besides, the committee is responsible for the divulgation of the annual certification examinations chronogram and its results.

2. The Certification Process

2.1 Areas of actuation or Types of Certificates.

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Until 2007, the CNEN granted 2330 radiation protection supervisor certificates for the following practices or installations:

2.1.1 Radioactive Installations

- Irradiation Facility
- Radiotherapy
- Industrial Radiography
- Nuclear Medicine
- Radioactive Tracers
- Particle Accelerator Facility

2.1.2 Nuclear Installations

-Nuclear Power Plant
-Research Nuclear Reactor
-Uranium and Thorium Mining
-Treatment of Uranium and Thorium Ores
-Production of UF4/UF6
-Isotope Enrichment
-Fuel Element Fabrication

2.1.3 Others

-Waste Management
-Transport

2.2 Certification Requirements

Based on the NN 3.03 CNEN standard the Certification process evaluates the following items: - the candidate's graduation; the candidate's knowledge of generic aspects of radiation protection as well as specifics topics related to the practice or installations that he intends to supervise; the candidate's skills concerning the tasks that he is expected to perform at the practice or installation in which he intends to work.

2.2.1 Graduation

The NN 3.03 CNEN standard [1] determines that the certification candidate must have a University Certificate in one of these areas: Biomedicine, Scientific or Technology. Besides, the NE 3.02 CNEN standard [3] is more specific and requires that Radiation Protection Supervisor must have a University degree in physics, chemistry, engineering, medicine, biology, pharmacy, veterinary, agriculture; biophysics, biochemist and geology.

2.2.2 Training

The CNEN requires that the candidate must demonstrate that he has had proper training relative to the area in which he intends to be certified.

The training syllabus is based on competency analysis. For the Radiation Protection Supervisors Qualification, the training syllabus must focus on specific jobs risks. In accordance with the IAEA - TECDOC 1254 "Training the Staff of the Regulatory Body for Nuclear Facilities" [4] competency is "a group of related knowledge, skills, and attitudes needed to perform a particular job" . Based on the same IAEA TECDOC "knowledge represents the depth and breadth of absorbed and retained information by the mental faculty of a person that would enable that person to deal with different situations, changes, and the unexpected". Skills are the demonstrated abilities and expertness of a

person to perform a task to prescribed standards as judged by an evaluator. Attitude is the appreciation and the practiced behavior of a person to perform a job or a task with due diligence".

2.2.3 Knowledge Examinations

In the CNEN certification process there are two types of examinations; denominated general examination and specific examination. For the preparation, application, and correction of these examinations, there are groups of individuals indicated or named annually, by a proper act of the CNEN Radiation Protection Directory.

The general examination basically covers generic fundaments of: - atomic and nuclear physics; radiation protection; - dosimetry; - radiation monitoring; - biological effects of ionizing radiation – standards.

The main objective of the general examination is to assure that the candidate has enough generic knowledge about radiation protection.

The specific examinations are prepared taking into account the various aspects of each specific installation or practice including: - type of installation; - job description; – risk involved; - operating procedures; - phases of operation; - normal and emergency procedures; - environment control. The specific examination covers these aspects to assure that the supervisor is able to perform its activities during normal and emergency situations.

3. Renewal of the Certification

The Radiation Supervisor Qualification Certification is valid for 5 years. Afterwards, the certification can be renewed by CNEN. For that the Radiation Supervisor must have demonstrated that he has been working in the Radiation Protection for, at least, 2 and a half years. The performance of the Radiation Protection Supervisor is verified by CNEN. This is accomplished this by means of inspections; reviews of operational reports and events.

4. Cancel of Certification

The Supervisor actuation must comply with the CNEN standard, which clearly defines the Radiation Protection Supervisor responsibilities.

4.1 Supervisor Responsibilities

The CNEN standard NN 3.01 [5] establishes Radiation Protection Supervisor responsibilities as the following:

- to advice and inform the facility direction about all the radiation protection subjects
- to implement the radiation protection plan approved by CNEN
- to plan, coordinate, implement and supervise the activities of the radiation protection service, in order to assure the basic radiation protection requirements are accomplished.
- to coordinate, orientate, evaluate the training and performance of the exposed workers according to the radiation protection's guidelines.

When the actuation of any one radiation supervisor does not comply with CNEN standard, his Certification is cancelled.

5. Public Communications

The role of public communication is very important in the Certification Process. It can be done in an effective and transparent way. The transparency allows the stake holders to verify that the objectives

of certification have been reached. For the candidates the certification process transparency allows them to be very well oriented about the tests calendar, the syllabus related to the tests and other information concerning the tests. It also assures that candidates can view that they have been submitted to the same level of difficulty during the tests. In the CNEN site there are links to the Candidate Manual, Test Calendar, and CNEN Standards.

6. Conclusions

The CNEN certification process follows the CNEN standard NN3.03 and the performance of the Brazilian Radiation Protection Supervisor as well as proving their acceptable technical capacity. Cases in which the certification has been cancelled are rare. However there is room for improvement in this process. The first step in the CNEN certification process improvement is the revision of CNEN standard NN 3.03 [1]. This revision is on going and probably will finish at the end of 2008. It includes alterations concerning training, areas of actuation and the cancellation of the certification. After the revision of NN3.03 the Candidate Manual will be revised in order to encompass the revised NN 3.03 CNEN standard.

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