CCIC CANADA INC.

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NDT 人员认证方案

NDT 人员资格和认证

NDT Personnel Certification Scheme

Qualification and Certification of NDT Personnel

（ISO 9712: 2021）

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1 范围

Scope

1.1 本方案规定了从事工业无损检测（NDT）人员的资格和认证要求。无损检测检测人员的资格认证按照本方案实施。

This document specifies requirements for the qualification and certification of personnel who perform industrial non-destructive testing (NDT). The certification of NDT personnel shall be carried out in accordance with this document.

1.2 认证包括以下方式:

The NDT personnel certification covers the following methods:

a) 超声检测（UT）

ultrasonic testing (UT)

b) 射线照相检测（RT）

radiographic testing (RT)

c) 磁粉检测（MT）

magnetic particle testing (MT)

d) 渗透测试（PT）

penetrant testing (PT)

e) 目视检测（VT）

Visual testing (VT)

f) 涡流检测（ET）

Eddy current testing (ET)

g) 泄漏检测（LT）

Leak testing

注：目前CCIC暂不开展对声发射测试（AT）的人员认证。待CCIC完成研发，将通过修订本认证方案再开始对LT和AT人员开展认证。

Note: CCIC doesn’t offer the personnel certification for acoustic emission testing (AT) at present. When CCIC is ready to certify AT, this certification scheme will be revised.

1.3 附录 A 给出了每种检测方法的门类。

The sectors for each testing method are given in Annex A.

2 规范性引用文件

Normative reference

以下文件对于申请本认证方案的应用是必不可少的:

The following documents are indispensable for the application of this certification scheme.

ISO/IEC 17024:2012 合格评定 - 人员认证机构的通用要求

ISO/IEC 17024:2012 Conformity Assessment -- General requirements for bodies operating certification of persons

ISO 9712: 2021 无损检测 - 无损检测人员的资格和认证

ISO 9712: 2021 Non-destructive testing – Qualification and certification of NDT personnel

ISO/TS 25107: 2019 无损检测 – NDT 培训大纲

ISO/TS 25107: 2019 Non-destructive testing – NDT training syllabuses

ISO/TS 25108:2018 无损检测 - NDT 人员培训机构

ISO/TS 25108: 2018 Non-destructive testing – NDT personnel training organizations

ISO/TS 22809:2007 无损检测——用于资格考试的试样不连续性

ISO/TS 22809:2007 Non-destructive testing — Discontinuities in specimens for use in qualification examinations

3 术语和定义

Terms and definitions

本方案采用如下术语和定义:

For the purpose of this document, the following terms and definitions apply.

3.1 申请人

applicant

已提交申请以进入认证过程的人

person who has submitted an application to be admitted into the certification process

3.2 授权的资料鉴定机构

authorized qualification body

独立于雇主由 CCIC 授权准备和管理考试的机构。

body, independent of the employer, authorized by CCIC to prepare and administer examinations.

3.3 基础考试

basic examination element

3 级笔试，证明考生了解材料科学与工艺技术和不连续类型、具体的资格和认证体

系，以及第 2 级要求的无损检测方法的基本原理。

written examination, at Level 3, which demonstrates the candidate's knowledge of the materials science and process technology and types of discontinuities, the specific qualification and certification system, and the basic principles of NDT methods as required for Level 2.

3.4 候选人

candidate

已满足规定的前提条件并获准进入认证过程的申请人。

applicant who has fulfilled specified prerequisites and has been admitted to the certification process.

注：在考试过程中，候选人也经常被称为“报考人”。

Note: Candidates are also often referred to as "participant" during the examination process.

3.5 证书

certificate

CCIC 根据本文件规定出具的信函、卡片或其他媒介形式的文件（如数字证书），证明相关人已满足认证要求。

document in the form of a letter, card or other medium (e.g. digital certificate), issued by CCIC under the provisions of this document, indicating that the named person has fulfilled the certification requirements

3.6 认证机构

certification body

根据规定要求实施认证程序的机构。

body that administers procedures for certification according to specified requirements

注：在本方案中，CCIC 是认证机构。

Note: In this document, CCIC is the certification body.

3.7 认证周期

certification cycle

从认证之日到重新认证之日允许的最长期限，包括更新期限。

maximum period of time permitted from the date of certification to the date of recertification inclusive of the renewal period

3.8 认证过程

certification process

CCIC 确定一个人符合认证要求的活动，包括申请、评审、认证决定、延期、再认证以及证书和徽标/标志的使用。

activities by which CCIC determines that a person fulfils certification requirements, including application, assessment, decision on certification, renewal, recertification and use of certificates and logos/marks

3.9 认证要求

certification requirements

一组规定的要求，包括为建立或维持认证而需要满足的方案要求。

set of specified requirements, including requirements of the scheme to be fulfilled in order to establish or maintain certification

3.10 能力

competence

运用知识和技能实现预期结果的能力。

ability to apply knowledge and skills to achieve intended results

3.11 雇主

employer

聘用候选人的法人实体。

legal entity by whom the candidate is employed

注：候选人可以是自雇人士。

Note: A candidate may be self-employed.

3.12 考试

examination

作为评审的一部分的机制，通过一种或多种方式衡量候选人的能力。

mechanism that is part of the assessment which measures a candidate's competence by one or more means

3.13 考试中心

examination center

经 CCIC 批准的资格考试中心。

center approved by CCIC where qualification examinations are carried out.

3.14 考试要素

examination element

考试的组成部分

component of an examination

3.15 考官

examiner

在考试需要专业判断的情况下，有能力进行考试并为其评分的人

person competent to conduct and score an examination, where the examination requires professional judgement

3.16 通用考试

general examination element

1 级或 2 级笔试，涉及 NDT 方法的原理。

written examination, at Level 1 or Level 2, concerned with the principles of an NDT method

3.17 高等教育

higher education

中学教育后在工程或科学领域的正式学习。

formal learning that occurs after completion of secondary education in the field of engineering or science

3.18 行业经验

industrial experience

在相关门类的无损检测方法中，在监督下进行的获得技能和知识的工作活动，以满足资格的要求。

work activities performed under supervision, in the NDT method in the sector concerned, needed to acquire the skill and knowledge to fulfil the provisions of qualification

3.19 监考人

测试管理员

Invigilator （proctor）

test administrator

CCIC 授权的人，负责监督考试，但不评估考生的能力。

person authorized by CCIC who supervises an examination, but does not evaluate the competence of the candidate

3.20 岗位培训

job-specific training

由雇主（或其代理人）向获证人员提供的关于雇主产品、NDT 设备、NDT 程序以及无损检测适用的法规、标准、规范和程序的培训，从而获得操作授权

training, provided by the employer (or their agent) to the certificate holder in aspects of non-destructive testing specific to the employer's products, NDT equipment, NDT procedures, and applicable codes, standards, specifications and procedures, leading to the award of operating authorizations

3.21 主方法考试

main-method examination

3 级笔试，证明候选人的通用知识和专业知识，以及编写适用于寻求认证的工业或产品门类的 NDT 方法的 NDT 程序的能力

written examination, at Level 3, which demonstrates the candidate's general and specific knowledge, and the ability to write NDT procedures for the NDT method as applied in the industrial or product sector(s) for which certification is sought

3.22 多项选择题

multiple choice examination question

可能有多个答案，但只有一个是正确的，其他都是不正确或不完整的问题表述

wording of a question giving rise to potential replies, only one of which is correct, the remaining being incorrect or incomplete

3.23 NDT 规程

NDT instruction

根据既定标准、法规、规范或 NDT 程序进行检测时应遵循的精确步骤的书面描述。

written description of the precise steps to be followed in testing to an established standard, code, specification or NDT procedure

3.24 无损检测介质

NDT media

用于产生由缺陷或瑕疵引起的可见迹象的检测产品。

testing products used to create visible indications caused by imperfections or flaws

示例： 磁粉、对比助剂涂料、颜色对比渗透剂、显影剂。

EXAMPLE Magnetic powder, contrast aid paints, color contrast penetrant, developer.

3.25 无损检测方法

NDT method

在无损检测中应用物理原理的学科。

discipline applying a physical principle in non-destructive testing

示例：超声检测。

EXAMPLE Ultrasonic testing.

3.26 NDT 人员

NDT personnel

实施无损检测的人员

personnel who perform non-destructive testing

3.27 无损检测程序

NDT procedure

根据标准、法规或规范对产品进行无损检测时，所有基本参数和措施的书面描述。

written description of all essential parameters and precautions to be applied when non-destructively testing products in accordance with standard(s), code(s) or specification(s)

3.28 NDT 技术

NDT technique

使用 NDT 方法的具体方式

specific way of utilizing an NDT method

3.29 NDT 培训

NDT training

寻求认证的 NDT 方法的理论和实践教学过程，其根据 CCIC 批准的教学大纲提供培训课程的。

process of instruction in theory and practice in the NDT method in which certification is sought, which takes the form of training courses to a syllabus approved by CCIC

3.30 操作授权

operating authorization

雇主根据认证范围出具的书面声明，授权个人执行特定任务。

written statement issued by the employer, based upon the scope of certification, authorizing the individual to carry out specified tasks

3.31 实践考试

practical examination element

实践技能的评估，候选人表现出熟悉和执行检测的能力。

assessment of practical skills, in which the candidate demonstrates familiarity with, and the ability to perform, the test

3.32 心理测量过程

psychometric process

验证考试是公平的、可靠的，并能区分合格和不合格的个人的统计过程。

statistical process to verify examinations are fair, reliable and discriminate between a competent and non-competent individual

3.33 资质

qualification

已证明的教育，培训和工作经验。

demonstrated education, training, and work experience

3.34 再认证

recertification

通过考试或以其他方式使 CCIC 认为其满足已发布的再认证标准来重新确认证书的过程。

process for revalidation of a certificate by examination or by otherwise satisfying CCIC that the published criteria for recertification have been met

3.35 推荐人

referee

证明候选人行业经验有效性的个人。

individual that attests the validity of the candidate’s industrial experience

3.36 续证

renewal

在初次、补充或再认证考试成功后五年内的任何时间再次确认认证的过程。

process for revalidation of a certification at any time up to five years after success in an initial, supplementary or recertification examination

3.37 门类

sector

使用专业 NDT 实践的行业或技术领域，需要特定的产品相关知识、技能、设备或培训。

section of industry or technology where specialized NDT practices are used, requiring specific product-related knowledge, skill, equipment or training

3.38 重大中断

significant interruption

工作活动的缺席或变化，导致获证人员无法履行获证范围内的方法和门类的级别相对应的职责，连续时间超过一年，或总时间超过两年或两年以上。

absence or change of work activity which prevents the certified individual from

practising the duties corresponding to the level in the method and the sector(s) (3.37) within the certified scope, for either a continuous period in excess of one year, or two or more periods for a total time exceeding two years

注：计算中断时不考虑法定节假日或病假或少于 30 天的课程。

NOTE Legal holidays or periods of sickness or courses of less than 30 days are not taken into account when calculating the interruption.

3.39 专业考试

specific examination element

1 级或 2 级书面考试，针对在特定门类中应用的检测技术，包括被测产品和法规、标准、规范、程序和验收准则的知识。

written examination, at Level 1 or Level 2, concerned with testing techniques applied in a particular sector(s), including knowledge of the product(s) tested and of codes, standards, specifications, procedures and acceptance criteria

3.40 规范

specification

说明要求的文件。

document stating requirements

3.41 试样

specimen

实操考试中使用的样品，可能包括射线照片和数据集，这些样品代表了适用门类中通常测试的产品。

sample used in practical examinations, possibly including radiographs and data sets, which is representative of products typically tested in the applicable sector

注：一个样品可以包括多个要测试的区域或体积。

NOTE A specimen can include more than one area or volume to be tested.

3.42 试样的标准检测报告

specimen master report

标准答案，在给定一组条件（设备类型、设置、技术、试样等）的情况下实操考试的最佳结果，考生的测试报告将根据这些条件进行评分。

model answer, indicating the optimum result for a practical examination given a defined set of conditions (equipment type, settings, technique, specimen, etc.) against which the candidate’s test report is graded

3.43 结构化学分体系

structured credit system

基于候选人的 NDT 活动的计分系统，用作续证或再认证考试的替代方案。

point system based on the NDT activities of the candidate used as an alternative to examination for renewal or recertification

3.44 结构化经验方案（SEP）

structured experience program (SEP)

CCIC 批准的减少行业经验的计划。

program approved by CCIC to reduce industrial experience

3.45 监督

supervision

指导其他 NDT 人员实施 NDT 的行为，包括测试准备、测试执行和结果报告所涉及的措施控制。

act of directing the application of NDT performed by other NDT personnel, which includes the control of actions involved in the preparation of the test, performance of the test and reporting of the results

3.46 工作活动

work activity

NDT 相关职能和任务的执行。

performance of NDT-related functions and tasks

3.47 投诉

complaint

除申诉外，任何个人或组织对 CCIC 的 NDT 人员认证服务、获证人员表示不满意并期望得到回复的行为。

expression of dissatisfaction, other than appeal by any individual or organization to CCIC relating to this NDT personnel certification service, certified person, where a response is expected

3.48 申诉

appeal

申请人、候选人或认证人员要求重新考虑 CCIC 做出的与其所期望的认证状态相关的任何决定。

request by applicant, candidate or certified person for reconsideration of any decision made by CCIC related to her/his desired certification status

4 职责

Duties and responsibilities

4.1 CCIC 作为认证机构:

CCIC as the certification body

a) 应根据 ISO/IEC 17024 和 ISO 9712 建立、促进、维持和管理认证方案，确保以公正、有能力和一致的方式提供认证；

shall initiate, promote, maintain and administer the certification scheme according to ISO/IEC 17024 and ISO 9712 to ensure the certification is delivered in an impartial, competent and consistent way;

b) 应独立于任何利益方；

shall be independent of any single interest;

c) 应负责规定门类

shall be responsible for the definition of sectors

d) 应公布有关认证方案范围的信息和认证过程的通用说明；

shall publish information regarding the scope of the certification scheme and a general description of the certification process;

e) 应为培训课程提供信息，包括体现 ISO/TS 25107 或等效文件的教学大纲；

shall provide information for training courses that include the syllabi which embody the content of ISO/TS 25107 or equivalent;

f) 应对授权的资格认证机构进行初步审核和随后的定期监督审核，以确保其符合规范；

shall conduct an initial audit and subsequent periodic surveillance audits of the authorized qualification body(ies) to ensure their conformity to the specifications;

g) 应按照形成文件的程序监控所有授权的职能；

shall monitor, in accordance with a documented procedure, all delegated functions;

h) 应批准配备适当人员和设备的考试中心，并定期对其进行监控；

shall approve properly staffed and equipped examination centers, which it shall monitor on a periodic basis;

i) 应按照形成文件的程序进行考试；

shall delivered examinations as documented procedure;

j) 应对在外部场所进行的检查承担全部责任；

shall bear full responsibilities for examinations conducted at external premises;

k) 负责确保所有考试资料（考试试样、试样标准检测报告、题库、试卷等）的安全，并确保这些资料不用于培训目的；

shall be responsible for ensuring the security of all examination materials

(examination specimens, specimen master reports, question banks, examination papers, etc.) and shall ensure that these materials are not in use for training purposes;

l) 应负责认证的授予、扩展范围、暂停、撤销或再次确认；

shall be responsible for granting, extension, suspension, withdrawal or revalidation of certification;

m) 应建立适当的记录维护体系，该体系应至少保留两个认证周期；

shall establish an appropriate system for the maintenance of records, which shall be retained for at least two certification cycles;

n) 应要求所有候选人和获证人员签署或盖章承诺遵守其应为此目的制定并公布的行为准则；

shall require all candidates and certificate holders to give a signed or stamped undertaking to abide by a code of conduct which it shall develop for the purpose and publish;

o) 应以 ISO/TS 25108 为指南批准培训机构；

should approve training bodies by using ISO/TS 25108 as guidance;

p) 可在直接责任下将资格的具体管理委托给授权的资格机构，应向其发布有关设施、人员、验证和控制 NDT 设备、考试资料、试样、考试、考试评分和记录等的规范和/或程序；

may delegate, under its direct responsibility, the detailed administration of qualification to authorized qualification bodies, to which it shall issue specifications and/or procedures covering facilities, personnel, verification and control of NDT equipment, examination materials, specimens, conduct of examinations, examination grading, records, etc.;

q) 应建立教官授权流程；

shall establish a process to authorize examiners;

r) 应建立监督工作活动的条件，候选人可声明的经验；

shall establish the conditions for the supervision of work activities, which candidates may claim experiences)

s) 应建立高等教育的承认程序；

shall establish a process for the recognition of higher education;

t) 应建立批准未获认证的个人作为推荐人的程序；

shall establish a process for the approval of non-certified individuals as a referee;

u) 应建立批准结构化学分体系批准流程（如使用）；

shall establish a process for the approval of a structured credit system, where used;

v) 可规定候选人的最低年龄要求；

may specify a minimum age requirement for candidates;

w) 应维护和更新题库和考试试样及其试样的标准检测报告；

shall maintain and update the question bank and the examination specimens along with their specimen master report;

x) 应仅在 CCIC 授权的监考人在场并在其控制下进行考试，以确保公正性；

shall conduct the examination only in the presence of, and under the control of, an authorized invigilator of CCIC, to ensure that impartiality is maintained;

y) 应建立结构化经验方案的批准流程（如使用）。

shall establish a process for the approval of a structured experience program, where used.

4.2 Authorized qualification body

授权资质机构

4.2.1 Where established, the authorized qualification body shall:

经授权的资格认证机构应：

a) 在 CCIC 管理上工作，并应用 CCIC 发布的规范；

work under the control of and apply the specifications issued by CCIC;

b) 独立于任何主要利益方；

be independent of any single predominant interest;

c) 确保对每个申请资格的候选人是公正的，并提请 CCIC 注意其受到的任何或潜在的公正性威胁；

ensure that it is impartial with respect to each candidate seeking qualification, bringing to the attention of CCIC any actual or potential threat to its impartiality;

d) 实施 CCIC 批准的形成文件的质量管理体系；

apply a documented quality management system approved by CCIC;

e) 拥有建立、监督和控制考试中心所需的资源和专业知识，包括考试以及设备的校准和控制；

have the resources and expertise necessary to establish, monitor and control examinations centers, including examinations and the calibration and control of the equipment;

f) 对候选人进行资格审查，包括申请审查和做出资格决定；

conduct qualification of candidates including review of application and decision on eligibility;

g) 准备、监督和管理考试；

prepare, supervise and administer examinations;

h) 向 CCIC 提供做出认证决定所需的资格结果；

provide CCIC with the results of qualification needed to make a decision on certification by CCIC;

i) 按照 CCIC 的要求保存适当的资格和考试记录。

maintain appropriate qualification and examination records according to the requirements of CCIC.

CCIC 没有授权资质机构时，CCIC 应当履行资质机构的要求。

If there are no authorized qualification bodies, CCIC shall fulfill the requirements of the qualification body.

4.3 Examination center

考试中心

4.3.1 The examination center shall:

考试中心应：

a) 在 CCIC 的控制下工作；

work under the control of CCIC or authorized qualification body;

b) 实施 CCIC 批准的形成文件的质量程序；

apply a documented quality procedure approved by CCIC;

c) 拥有准备和进行考试所需的资源，包括设备的验证和控制；

have the resources needed to prepare and conduct examinations, including the verification and control of equipment;

d) 拥有足够的有资质人员、场所和设备，以确保对相关级别、方法和门类进行考虑； 允许使用外部场所；

have adequate qualified staff, premises and equipment to ensure satisfactory examinations for the levels, methods, and sectors concerned; the use of external premises is allowed;

e) 由 CCIC 授权的考官准备和进行考试，仅使用 CCIC 为此目的制定或批准的考试问卷和试样；

prepare and conduct examinations under the responsibility of an examiner authorized by CCIC, using only examination questionnaires and specimens established or approved by CCIC for that purpose;

f) 按照 CCIC 的要求保存适当的考试文件。

maintain appropriate examination documents according to the requirements of CCIC.

4.3.2 CCIC 目前自己进行所有考试。 不排除 CCIC 未来可能会授权考试中心。

CCIC conducts all examinations now. It doesn't preclude CCIC may authorize examination center in the future.

4.4 雇主

Employer

4.4.1 雇主应记录候选人的个人信息，其中应包括确定候选人资格所需的教育、培训和行业经验以及视力。 如果候选人是自雇人士，行业经验应由推荐人证明。从雇主获得的所有文件应经 CCIC 核实。

The employer shall document the personal information which shall include the declaration of education, training and industrial experience and visual acuity needed to determine the eligibility of the candidate. If the candidate is self-employed, the industrial experience shall be attested to by a referee. All documentation obtained from the employer shall be verified by CCIC.

4.4.2 对管理的获证 NDT 人员，雇主应负责：

In respect of certified NDT personnel under their control the employer shall be responsible for:

a) 与操作授权有关的所有内容，即提供岗位培训（如必要）；

all that concerns the authorization to operate, i.e. providing job-specific training (if necessary);

b) 签发书面操作授权；

issuing the written authorization to operate;

c) 无损检测活动的结果；

the results of NDT activities;

d) 确保满足年度视力要求；

ensuring that the annual vision requirements are met;

e) 保留文件证据，证明在相关门类中 持续应用 NDT 方法，没有重大中断； 该措施应每 12 个月进行一次；

maintaining documentary evidence confirming the continuous application of the NDT method in the relevant sector(s) without significant interruption; this action shall be done every 12 months;

f) 确保人员持有与其在机构内的任务相关的有效证书；

ensuring that personnel hold valid certification relevant to their tasks within the organization;

g) 保持适当的记录。

maintaining appropriate records.

4.4.3 自雇人员应承担雇主所有职责。

A self-employed individual shall assume all responsibilities ascribed to the employer.

4.4.4 依据本方案认证提供了 NDT 人员全面能力的证明。认证不代表操作授权，因为这仍然是雇主的责任，并且获得认证的员工可能需要其他的专业知识，例如雇主特有的设备、NDT 程序、材料和产品。

Certification to this document provides an attestation of general competence of the NDT personnel. It does not represent an authorization to operate, since this remains the responsibility of the employer, and the certified employee may require additional specialized knowledge of parameters such as equipment, NDT procedures, materials and products specific for the employer.

4.4.5 如果有监管和法规要求，操作授权应由雇主根据质量程序以书面形式授予，该程序规定了雇主要求的岗位培训和考试，旨在验证获证人对相关行业法规、标准、NDT 程序、设备和测试产品的验收准则。

Where required by regulatory requirements and codes, the authorization to operate shall be given in writing by the employer in accordance with a quality procedure that specifies any employer-required job-specific training and examinations designed to verify the certificate holder's knowledge of relevant industry code(s), standard(s), NDT procedures, equipment, and acceptance criteria for the tested products.

4.5 候选人

Candidate

4.5.1 候选人，无论是受雇、自雇还是失业，应：

Candidates, whether employed, self-employed or unemployed shall:

a) 提供圆满完成培训课程的书面证明；

provide documentary evidence of satisfactory completion of a course of training;

b) 提供可验证的书面证据，证明在有能力的监督下获得了所需的经验；

provide verifiable documentary evidence that the required experience has been gained under qualified supervision;

c) 提供满足要求的视力书面证据；

provide documentary evidence of vision satisfying the requirements;

d) 遵守 CCIC 发布的行为准则。

abide by Code of Conduct published by CCIC.

e) 满足 CCIC 要求的其他必要条件。

provide other requisites requested by CCIC.

4.5.2 候选人必须在考试之日起两 (2) 年内完成资格认证。 否则需要重新参加所有考试。如果候选人能够证明有特殊情况，CCIC 可以给予豁免，但仍然需要参加实践考试。

Candidates are required to finalize qualification and certification no later than two (2) years from the date of examination. Otherwise retaking all examinations is required. CCIC may grant exemption if the candidates can prove exceptional circumstances, however the practical examination is still required.

4.6 获证人员

Certificate holders

获证人员应：

Certificate holders shall:

a) 遵守 CCIC 发布的行为准则；

abide by Code of Conduct published by CCIC;

b) 保持证明已满足视力要求的记录，；

maintain records demonstrating evidence that vision requirements have been fulfilled;

c) 不符合认证有效性条件的，通知 CCIC 和雇主。

notify CCIC and the employer in the event that the conditions for validity of certification are not fulfilled.

4.7 Examiners

考官

4.7.1 考官应：

Examiners shall:

– 经 CCIC 授权实施、监督考试并评分；

be authorized by CCIC to conduct, supervise and grade examinations;

– 在授权的产品和/或门类的 NDT 方法中获得 3 级认证。

be certified to Level 3 in the NDT method in the product and/or industrial sector for which they are authorized.

4.7.2 考官：

An examiner：：

– 候选人接受过考官的培训，在培训结束之日起两年内不得对该候选人进行考试；

shall not be permitted to examine any candidate that they have trained for the examination for a period of two years from the date of the conclusion of the training;

– 候选人与考官在同一设施中（永久或临时）工作的人，不得对该候选人进行考试。

shall not be permitted to examine any candidate who is working (permanently or temporarily) in the same facility as the examiner.

4.8 推荐人

Referee

推荐人应:

referee shall be:

a) 在任何 NDT 方法中获得 2 级或 3 级认证； 或者

certified to Level 2 or 3 in any NDT method; or

b) 经 CCIC 批准，拥有证明候选人行业经验所需的知识、技能、培训和经验的非认证人员。

non-certified personnel who, approved CCIC, possess the knowledge, skill, training and experience required to attest to the candidate's industrial experience.

注: 对于初始认证，推荐人应该能够指导和管理候选人的活动。 同事和熟人不符合这个要求。 对于续证和再认证，无此要求。

NOTE: For initial certification, referees should be in a position to direct and control the activities of the candidate. Colleagues and acquaintances don't meet this requirement. For renewal and recertification, it isn't required as such.

5 Levels of qualification

认证级别

5.1 Level 1

1 级

5.1.1 获得 1 级认证的人员已被证明有能力根据书面规程并在 2 级或 3 级人员的监督下进行无损检测。 在证书规定的能力范围内，1 级人员可以由雇主授权按照 NDT 规程执行以下工作:

An individual certified to Level 1 has demonstrated competence to carry out NDT according to written instructions and under the supervision of Level 2 or Level 3 personnel. Within the scope of the competence specified on the certificate, Level 1 personnel may be authorized by the employer to perform the following in accordance with NDT instructions:

a) 设置 NDT 设备;

set up NDT equipment;

b) 实施检测；

perform the tests;

c) 根据书面准则记录和分类测试结果；

record and classify the results of the tests according to written criteria;

d) 报告结果。

report the results.

5.1.2 1 级获证人员不负责选择使用的检测方法或技术，也不负责检测结果的解释。

Level 1 certified personnel shall neither be responsible for the choice of test method or technique to be used, nor for the interpretation of test results.

5.2 2 级

Level 2

2 级获证人员已证明有能力根据 NDT 程序或 NDT 规程实施无损检测。 在证书规定的能力范围内，雇主可以授权二级人员：

An individual certified to Level 2 has demonstrated competence to perform NDT according to NDT procedures or NDT instructions. Within the scope of the competence defined on the certificate, Level 2 personnel may be authorized by the employer to:

a) 为要使用的检测方法选择 NDT 技术；

select the NDT technique for the testing method to be used;

b) 规定检测方法的应用限制；

define the limitations of application of the testing method;

c) 将 NDT 法规、标准、规范和程序转成适合实际工作条件的 NDT 规程；

translate NDT codes, standards, specifications, and procedures into NDT instructions adapted to the actual working conditions;

d) 建立和验证设备设置；

set up and verify equipment settings;

e) 执行和监督测试；

perform and supervise tests;

f) 根据适用的标准、法规、规范或程序解释和评价结果；

interpret and evaluate results according to applicable standards, codes, specifications or procedures;

g) 执行和监督 2 级或以下级别的所有任务；

carry out and supervise all tasks at or below Level 2;

h) 为 2 级或以下级别人员提供指导；

provide guidance for personnel at or below Level 2;

i) 报告 NDT 结果。

report the results of NDT.

5.3 3 级

Level 3

5.3.1 3 级获证人员已证明有能力执行和指导其获得认证的 NDT 操作。 3 级人员已证明:

An individual certified to Level 3 has demonstrated competence to perform and direct NDT operations for which they are certified. Level 3 personnel have demonstrated:

a) 根据现有标准、法规和规范评价和解释结果的能力；

the competence to evaluate and interpret results in terms of existing standards, codes, and specifications;

b) 对适用材料、制造、工艺和产品技术有足够的实践知识，以选择 NDT 方法和建立 NDT 技术，并在没有验收准则时可协助建立验收标准；

sufficient practical knowledge of applicable materials, fabrication, process, and product technology to select NDT methods, establish NDT techniques, and assist in establishing acceptance criteria where none are otherwise available;

c) 熟悉其他 NDT 方法。

a general familiarity with other NDT methods.

5.3.2 在证书规定的能力范围内，三级人员可被授权:

Within the scope of the competence specified on the certificate, Level 3 personnel may be authorized to:

a) 建立、编辑性和技术性审查，并确认 NDT 规程和程序；

establish, review for editorial and technical correctness, and validate NDT instructions and procedures;

b) 解释标准、法规、规范和程序；

interpret standards, codes, specifications, and procedures;

c) 指定要使用的特定测试方法、程序和 NDT 规程；

designate the particular test methods, procedures, and NDT instructions to be used;

d) 执行和监督各级的所有任务；

carry out and supervise all tasks at all levels;

e) 为各级 NDT 人员提供指南和辅导。

provide guidance and mentoring for NDT personnel at all levels.

6 Eligibility

资格

6.1 总则

General

候选人应在考试前满足视力和 NDT 培训的最低要求，并应满足行业经验的最低要求，在适用的情况下，在获得认证之前已年满 18 岁。

The candidate shall fulfil the minimum requirements of vision and NDT training prior to the examination and shall fulfil the minimum requirements for industrial experience and, where applicable, has reached 18 years old prior to certification.

6.2 培训

Training

6.2.1 候选人应提供培训证书或其他 CCIC 认可的证明文件，证明其已按申请认证的方法和级别圆满完成表 1 中的 NDT 培训。

The candidate shall provide training certificates or other documentary evidence, acceptable to CCIC, that he or she has satisfactorily completed NDT training in table 1 in the method and level for which the certification is sought.

6.2.2 对于所有级别，理论培训可以以面对面的讲师指导、远程学习、自定进度的形式或这些形式的组合。 实操培训应仅以面对面的讲师指导形式进行。 初始认证培训的有效期最长为自完成之日起十年。

For all levels, theoretical training may be delivered in a face-to-face instructor-led format, distance learning format, a self-paced format, or a combination of these formats. Practical training shall be delivered by a face-to-face instructor-led format only. The training for initial certification shall remain valid for a maximum period of ten years from the date of completion.

对于 3 级，除了表 1 中给出的最低培训外，资格准备可以根据候选人的科学和技术背景以不同的方式完成，包括参加其他培训课程、会议或研讨会、学习书籍、 期刊和其他专业的印刷或电子材料。

For Level 3, in addition to the minimum training given in Table 1, the preparation for qualification can be completed in different ways depending on the scientific and technical background of the candidate, including attendance at other training courses, conferences or seminars, studying books, periodicals and other specialized printed or electronic materials.

当使用远程学习时，应建立体系以确保完成整个培训大纲。

When a distance learning option is utilized, systems shall be established to ensure the entire training syllabus is completed.

6.2.3 认证候选人所接受的最短培训时间应传授技能和知识，并且不得少于 6.2.4 和表 1 中适用的无损检测方法的规定，并可以按 7.2.5 的规定减少时间 .

The minimum duration of training undertaken by the candidate for certification shall impart the skills and knowledge and shall not be less than that specified in 6.2.4

and Table 1 for the applicable NDT method, with the possible reductions specified in 6.2.5.

此培训时间基于候选人已拥有数学技能以及材料和过程的知识，可以通过适当筛选已完成的教育来确认。如果不是这种情况，CCIC 可能需要进行额外培训。

This duration is based upon candidates possessing mathematical skills and prior knowledge of materials and processes that can be confirmed by appropriately screening of completed prior education. If it is not the case, additional training on this matter may be required by CCIC.

培训时间包括实践课程和理论课程。

Training hours include both practical and theoretical courses.

6.2.4 直接进入 2 级需要表 1 中列出的 1 级和第 2 级的总天数。直接进入第 3 级需要表 1 中显示的第 2 级和第 3 级的总天数。当考虑获 3 级认证人员的职责时，3 级基础考试要素 C 项的内容（见表 4），其他 NDT 方法的额外培训是必要的。

Direct access to Level 2 requires the total days shown in Table 1 for Levels 1 and 2. Direct access to Level 3 requires the total days shown in Table 1 for Levels 2 and 3. When considering the responsibilities of a certified Level 3 and the content of item C of the basic examination element for Level 3 (see Table 4), additional training about the other NDT methods is necessary.

表 1 – 培训的最低要求

Table 1----Minimum training requirements

方法/门类 METHOD/SECTOR	1 级/天 Level 1 / Day	2 级/天 Level 2/Day	3 级/天 Level 3/Day
UT	8	10 PAUT: +5 天/days TOFD: +5 天/days	5
RT	5	10	5
MT	3	2	4
PT	3	2	3
VT	3	2	3
ET	5	6	6
LT	5	9	6
注：一天的时长至少为 7 个小时，可以在一天内完成，也可以通过累积小时数来实现。 对于 RT，培训天数不包括辐射安全培训。 NOTE：One day duration is at least seven hours, which can be achieved on a single day or by accumulating hours. For RT, training days does not include radiation safety training.			

6.2.5 培训时间可按下文缩减，当适用多次减少时，总减少不超过培训时间的 50%。 任何减少都需被 CCIC 接受，并应确保能力的维持。

The possible reductions in training duration are as described hereafter, provided

that, when several reductions are applicable, the total reduction does not exceed 50 % of the training duration. Any reduction requires acceptance by CCIC and shall ensure that competence is maintained.

a) 所有级别

For all levels:

- 对于寻求一种以上方法（即 MT、PT）认证的候选人，或对于已获认证并寻求另一种方法认证的候选人，当某些方面培训大纲是重复的（即产品技术）时，这些方法（即 PT、MT、VT）的培训总天数可以根据培训大纲减少；

  for candidates seeking certification in more than one method (i.e. MT, PT), or for those already certified and seeking certification in another method, when the training syllabus concerned duplicates certain aspects (i.e. product technology), the total number of training days for these methods (i.e. PT, MT, VT) may be reduced in line with the training syllabus;

- 对于毕业于技术学院或大学的相关学科，或已在学院或大学完成至少两年相关工程或科学学习（或同等正规教育）的候选人，所需的总培训时间可最多减少 50%。 根据申请，CCIC 在对教育方案涵盖的科目进行分析后，确定可以缩短的时间。

  for candidates who have graduated in a relevant subject from technical college or university, or have completed at least two years of relevant engineering or science study at college or university (or equivalent formal education), the total required training duration may be reduced by up to 50%. Upon request, CCIC shall determine the training duration can be reduced at its deliberation after analyzing the subjects covered by the study programs.

  注：学院或大学学习必须与 NDT 方法（化学、数学或物理）和/或产品或门类（化学、冶金、工程等）相关。

  Note: The college or university study must be relevant to the NDT method (chemistry, mathematics or physics) and/or to the product or industry sector (chemistry, metallurgy, engineering, etc.).

b) 对于 1 级和 2 级，当活动范围在应用和/或技术方面有限（并且未包含在附录 F 中）时，培训范围和持续时间最多可减少 50%。

For Levels 1 and 2, when the scope of activity is limited in application and/or in technique (and not covered in Annex F), the training scope and duration may be reduced by up to 50 %.

注：此类局限性的示例包括与应用方面（例如，棒材、管材和杆的自动 ET、UT 或超声波标准波束厚度以及冷轧钢板的层压测试）和技术（例如，仅使用气泡测试的泄漏测试，轭磁性粒子）的限制。

NOTE Examples of such limitations include those related to application (e.g. automated ET, UT of bar, tube, and rod or normal beam ultrasonic thickness

and lamination testing of rolled steel plate) and to technique (e.g. leak testing only using bubble test, yoke for magnetic particle).

6.3 行业 NDT 经验

Industrial NDT experience

6.3.1 总则

General

表 2 给出 b 候选人在申请认证的方法中获得的行业经验的最短持续时间，6.3.3 给出可能的缩减。 候选人申请多种方式认证时，经验的总时间为每种方法所要求的经验之和。

The minimum duration of industrial experience to be gained in the method where the candidate is seeking certification shall be as given in Table 2, with the possible reductions given in 6.3.3. When the candidate is seeking certification in more than one method, the total time of experience shall be the sum of the experience in each method.

如果在通过考试后获得部分经验，则考试结果的有效期最长为五年。

In the event that a part of the experience is sought following successful examination, the results of the examination shall remain valid for a maximum of five years.

经验证明文件由雇主或推荐人确认后提交 CCIC。

Documentary evidence of experience shall be confirmed by the employer or the referee and submitted to CCIC.

表 2 – 最少行业经验

Table 2 – Minimum industrial experience

NDT 方法 NTD method	经验（天数）Experiences in days					
	Level 1 1 级	Level 2 2 级		Level 3 3 级		
		有 1 级 with Level 1	直接申请 direct access	高等教育，2 级 higher education, with Level 2	2 级 with Level 2	有高等教育直接申请 direct access with higher education
AT, ET, LT, RT, UT	45	135	180	270	450	540
MT, PT, VT	15	45	60	180	240	360

注：一天的时长至少为七个小时，可以在一天内完成，也可以通过累积小时数来实现。 一天中允许的最大小时数为 12 小时。 通过将总累积小时数除以 7 来获得以天为单位的经验。

Note: One day duration is at least seven hours, which can be achieved on a single day or by accumulating hours. The maximum allowable hours in any one day is 12 hours. Experience in days is achieved by dividing the total accumulated hours by 7.

6.3.2 3 级

Level 3

3 级职责要求的知识超出任何特定 NDT 方法的技术范围。 这种广泛的知识可以通过教育、培训和经验来获得。表 2 详细说明了成功完成高等教育的候选人以及没有接受过高等教育的候选人的最低经验。

Level 3 responsibilities require knowledge beyond the technical scope of any specific NDT method. This broad knowledge may be acquired through a variety of combinations of education, training and experience. Table 2 details minimum experience for candidates who have successfully completed higher education, as well as candidates without higher education.

6.3.3 可能的缩减

Possible reductions

6.3.3.1 可按下文缩减经验持续时间。 任何减持均应获得 CCIC 同意。

The possible reductions in duration of experience are as described hereafter. Any reduction shall require acceptance by CCIC.

6.3.3.2 1 级、2 级或 3 级获证人员增加认证方法时允许在该方法的行业经验缩减 25%。

A certified Level 1, 2 or 3 adding an additional method is permitted a reduction of required experience of 25 % for that additional method.

6.3.3.3 1 级、2 级或 3 级获证人员对同一 NDT 方法更改门类、增加门类或技术，应要求在新申请的门类中获得表 2 要求的行业经验的 25%，并且持续时间不得少于 15 天。

A certified Level 1, 2 or 3 individual changing sector, adding another sector or technique for the same NDT method shall be required to gain additional experience of at least 25 % of the experience required in Table 2; and this shall never be less than 15 days in duration.

6.3.3.4 当申请的认证范围在应用中有限（即测厚或自动测试），经验持续时间最多可减少 50%，但不得少于 15 天。

When the scope of certification sought is limited in application (i.e. thickness measurement or automated testing), experience duration may be reduced by up to 50 % but shall not be less than 15 days.

6.3.3.5 多达 50% 的工业经验时间可以通过结构化经验方案 (SEP) 来实现。 参加 SEP 的 1 天相当于最多 5 天的行业经验。 SEP 应包括相关级别、方法和门类的所有典型任务。 另一个目的是获得特定的产品和技术知识。 SEP 应当事先经 CCIC 批准，并可被 CCIC 审核。

Up to 50 % of the industrial experience time may be achieved by a structured experience program (SEP). One day of attendance at the SEP is equivalent to a maximum of five days industrial experience. The SEP shall include all typical tasks of the level, method and sector concerned. The additional intent is to gain specific product and technique knowledge. The SEP shall be approved in advance by CCIC and shall be available for audit by CCIC.

6.4 视力要求 – 所有级别

Vision requirements — all levels

6.4.1 总则

General

候选人和获证人员应按照 6.4.2 至 6.4.4 保持并提供视力满足要求的书面证据。

Candidates and certificate holders shall maintain and provide documentary evidence of acceptable vision in accordance 6.4.2 to 6.4.4.

6.4.2 近视力

Near vision acuity

在认证之前和之后每年，应验证近视力是否符合 ISO 18490 的要求，或者应允许一只或两只眼睛，矫正或未矫正，在不小于 30 厘米处读取至少 Jaeger 1 号或 Times Roman N4.5 或等效字母。

Prior to certification, and annually thereafter, near vision acuity shall be verified to be in accordance with the requirements of ISO 18490 or shall permit reading a minimum of Jaeger number 1 or Times Roman N4.5 or equivalent letters at not less than 30 cm with one or both eyes, either corrected or uncorrected.

6.4.3 色觉

Color vision

6.4.3.1 在认证、再认证或续证之前，候选人/获证人员应证明在过去 5 个日历年内进行了色觉测试。

Prior to certification, recertification or renewal, the candidate/certificate holder shall demonstrate that a color vision test has been administered within the previous 5 calendar years.

6.4.3.2 要求色觉和/或灰度感知足以使个人能够识别和区分雇主指定的有关 NDT 方法/技术中使用的颜色或灰色阴影。

It is required that color vision and/or grey scale perception be sufficient for the individual to be able to distinguish and differentiate between the colors or shades of grey used in the NDT methods/techniques concerned as specified by the employer.

6.4.3.3 色觉测试应确认个人具有可接受的色觉而不受限制，或应说明对色觉的任何限制。

The color vision test shall either confirm that the individual has acceptable color vision without restriction or shall state any limitation(s) on color perception.

6.4.3.4 如果颜色感知存在任何限制，雇主应确认这种情况是否会导致对方法或应用特定技术的限制。

Where any limitation in color perception exists, the employer shall confirm whether or not this condition results in any limitation(s) to method or application specific techniques.

注：Ishihara 24 板测试是合适的色觉测试的示例 。

NOTE The Ishihara 24 plate test is an example of a suitable color vision test.

6.4.4 执行视力测试的人员

Personnel administering vision tests

近视力测试、色觉和/或灰度感知验证应由有执照的医师、护士、眼科医生或验光师进行；或由代表雇主的 3 级人员批准和记录的另一位受过培训的专业人员来进行。

Near vision acuity testing, color vision and/or grey scale perception verification(s) shall be administered by a licensed physician, nurse, ophthalmologist or optometrist; or by another trained professional who is approved and documented by a Level 3 personnel acting on behalf of the employer.

7 考试

Examinations

7.1 概述

Overview

7.1.1 总则

General

7.1.1.1 考试应适当涵盖 NDT 方法、技术、工业领域和/或产品门类。

The examination shall cover an NDT method, technique, industrial sector and/or product sector as appropriate.

7.1.1.2 CCIC 的的程序规定了试题开发和选择的流程。CCIC 应确保试题适合方法/技术/门类的相关教学大纲和认证级别。 过程设计应确保使用同行小组审查、专家意见、统计比较等方法确保考试结果的可比性，并且在考试规模允许的情况下，可使用心理测量学原则。 CCIC 建立了书面的适当方法和程序，以确保考试的公平性、有效性、可靠性和常规表现，以保持所有考试 70% 的及格分数。

The process used for the development and selection of examination questions is specified in a procedure prepared by CCIC. CCIC shall ensure the questions are appropriate for the relevant syllabus for the method/technique/sector, and for the level of certification. The process shall be designed to ensure the comparability of results of examinations using methods such as peer group review, input from subject matter experts, statistical comparisons, and, where the size of the examination cohort allows, psychometric principles may be used. CCIC establishes a documented appropriate methodology and procedures to ensure fairness, validity, reliability, and general performance of examinations to maintain an acceptable pass grade of 70 % for all examinations.

7.1.1.3 考试准备和实施过程旨在确保试题和试卷的保密性和安全性。

The processes for preparation and conduct of examinations is designed to ensure the confidentiality and security of examination questions and examination papers.

7.1.1.4 使用 CCIC 规定的流程维护和监控实操试样，以确保考试的一致性和公平性。

The practical specimens are maintained and monitored to ensure consistency and fairness of examinations using processes adopted by CCIC.

7.1.1.5 在申请人满足其他认证要求前，考试结果的有效期最长为五年。

The results of examinations shall remain valid for up to five years while the candidate completes any remaining certification requirements.

7.1.2 考试要素

Examination elements

7.1.2.1 1 级考试应包含以下考试要素：

For Level 1 the examination shall consist of the following examination elements:

- 通用考试；

  general examination element;

- 专业考试；

  specific examination element;

- 实操考试。

  practical examination element.

7.1.2.2 2 级考试应包含以下考试要素：

For Level 2 the examination shall consist of the following examination elements:

- 通用考试；

  general examination element;

- 专业考试；

  specific examination element;

- 实操考试；

  practical examination element.

- NDT 规程编写。

  NDT instruction writing element.

7.1.2.3 3 级考试应包含以下考试要素：

For Level 3 the examination shall consist of the following examination elements:

- 基础考试，由以下项目构成：

  basic examination element which consists of the following items:

  - 项目 A：技术知识；

item A technical knowledge;

- 项目 B：CCIC 文件的知识；

  item B CCIC's document knowledge;

- 项目 C：2 级方法知识；

  item C Level 2 knowledge of methods;

– 主要方法考试由以下项目构成：

main method examination element which consists of the following items:

- 项目 D：通用考试；

  item D general examination;

- 项目 E：专业考试；

  item E specific examination;

- 项目 F: NDT 程序。

  item F NDT procedures.

7.1.3 考试时间 Examination time

7.1.3.1 1 级和 2 级考试科目总时间：通用考试为 2 分钟每道多项选择题，专业考试为 3 分钟每道多项选择题。

For Level 1 and Level 2, the total time for the examination elements shall be based on two minutes per multiple choice examination question for general examination element and three minutes per multiple choice examination question for specific examination element.

7.1.3.2 三级考试内容的总时间应以此方式计算：项目 B、E，3 分钟每道多项选择题，项目 A、C、D，2 分钟每道多项选择题。

For Level 3, the total time for the examination elements shall be based on three minutes per multiple choice examination question in items B and E and two minutes for items A, C and D.

7.1.3.3 对于叙述题，第 3 级项目 F，NDT 规程编写，考试时间为 2 小时。对于实操考试元素，通常情况下，1 级、2 级和 3 级考试时间分别为 1 小时/试样、2 小时/试样和 3 小时/试样。

For questions requiring narrative answers, Level 3 item F, NDT instruction writing element, the time is less than 2hrs. And for the practical examination element, generally, the time for Level 1, 2 and 3 1hr/specimen, 2hrs/specimen and 3hrs/specimen respectively.

7.1.4 考试辅助

Examination aids

只有作为考试的一部分或 CCIC 批准的情况下，才允许使用法规、标准、规范、程序和电子设备等辅助工具。

The use of aids such as codes, standards, specifications, procedures and electronic devices is only permitted if supplied as part of the examination or authorized by CCIC.

7.2 一级、二级考试内容及评分

Examination content and grading for Level 1 and Level 2

7.2.1 通用考试

General examination element

7.2.1.1 综合考试至少有 40 道多项选择题，从考试当日有效的 CCIC 或授权资质机构的通用试题库中随机抽取。

The general examination element shall be a minimum of 40 multiple choice examination questions and shall be selected randomly from CCIC's or authorized qualification body's collection of general examination element questions valid at the date of examination.

7.2.1.2 国家法规未规定时，可以对射线检测方法进行辐射安全的附加考试。

Where not otherwise addressed by national regulations, there may be an additional examination on radiation safety for the radiographic testing method.

7.2.2 专业考试

Specific examination element

专业考试至少应有 20 道多项选择题，从考试当日有效的 CCIC 或授权的资格认证机构的专业考试试题库中选择。

The specific examination element shall be a minimum of 20 multiple choice examination questions selected from CCIC's or authorized qualification body's collection of specific examination element questions valid at the date of examination.

如果专业考试要素涵盖两个或更多门类，考虑所涉及的工业或产品门类（见附件 A），最少应有 30 道题。

If the specific examination element covers two or more sectors, the minimum number of questions shall be at least 30, taking into account the industrial or product sectors concerned (see Annex A).

7.2.3 实操考试

Practical examination element

7.2.3.1 实操考试应包括对所要求的试样进行测试、记录（对 2 级还需要解释）所需的结果信息，并按要求的格式报告结果。用于培训目的试样不得用于考试。

The practical examination element shall involve applying the test to prescribed

specimens, recording (and, for Level 2 candidates, interpreting) the resulting information to the degree required, and reporting the results in the required format. Specimens used for training purposes shall not be used for examination.

7.2.3.2 每个试样应被唯一性标识，并有一份标准检测报告，其中包括用于检测所规定的不连续性的所有设备设置（如适用）。 标识不得干扰试样的实际检测或检查，并且应尽可能在样品用于考试时对考生隐藏，以防止考生可能获得关联信息。 试样的标准检测报告的编制应基于至少两次独立测试，并由相应方法有 3 级证的人员进行验证，以用于考试评分。 用于编制试样标准检测报告的独立测试报告应作为记录保存。

Each specimen shall be uniquely identified and have a specimen master report which includes all of the equipment settings (if applicable) used to detect specified discontinuities. Markings shall not interfere with the practical testing or inspection of the specimen and shall, wherever practicable, be concealed from the candidate while the specimen is being used for examination to prevent potential information correlation by candidates. The specimen master report shall be compiled based upon at least two independent tests, and shall be verified by a Level 3 certificate holder in that method for use in grading examinations. The independent test reports from which the specimen master report is compiled shall be retained as records.

7.2.3.3 试样应针对一个或多个门类，代表现场几何形状，并应包含制造或服务期间可能发生的不连续性。 试样可能是天然的或人造的。 可以使用数据集、数字射线照相图像和/或胶片代替实物试样，但应至少检查一个实物试样。

Specimens shall be sector (one or more) specific, representing field geometries and shall contain discontinuities representative of those likely to occur during manufacturing or in service. They may be natural or artificial. Data sets, digital radiographic images and/or films can be used instead of physical specimens, but at least one physical specimen shall be examined.

用于调整或测定厚度、涂层或材料特性的试样不需要包含不连续性。 对于 RT，如果在数据集或用于 2 级解释的射线照相图像中显示了不连续性，则待测试样不需要包含不连续性。

Specimens used for adjustment or for determination of thickness, coating or material properties do not need to contain discontinuities. For RT, the specimens to be tested do not need to contain discontinuities if these are exhibited in the data sets or radiographic images for Level 2 interpretation.

7.2.3.4 CCIC 应确保待测试样数量对于相关等级、NDT 方法和门类是充分的，并且试样包含可报告的不连续性。 一级和二级实操考试的试样数量应符合附录 B 的规定。

CCIC shall ensure that the number of specimens to be tested is adequate to the level, NDT method and sector concerned, and that the specimens contain reportable discontinuities. The number of specimens to be tested in the Level 1 and Level 2 practical examinations shall be in accordance with Annex B.

7.2.3.5 1 级候选人应遵循考官提供的 NDT 规程。

The Level 1 candidate shall follow the NDT instruction(s) provided by the examiner.

7.2.3.6 2 级候选人应对给定的法规、标准或规范选择适用的 NDT 技术并确定操作条件。

The Level 2 candidate shall select the applicable NDT technique and determine the operating conditions related to a given code, standard or specification.

7.2.3.7 考试时间通常为 1 级 2 小时，2 级 3 小时。

The time allowed for the examination is generally 2hrs for Level 1 and 3hrs for Level 2.

7.2.4 NDT 规程编写考试

NDT instruction writing examination element

7.2.4.1 NDT 规程编写考试应包含由 2 级候选人创建书面 NDT 规程。

The NDT instruction writing examination element shall involve the creation of a written NDT instruction by the Level 2 candidate.

7.2.4.2 规程书面考试的权重见表 D.2。

See Table D.2 for the weighting of the written examination instruction element.

7.2.5 1 级和 2 级考试内容和评分

Examination content and grading for Level 1 and Level 2

7.2.5.1 通用、专业、实操和 NDT 规程编写考试应分别评分。当使用传统的纸质考试时，由考官负责通过与标准答案的比较来对考试进行评分。可以使用电子评估系统，根据存储的数据自动对候选人的答案进行评分，并根据准备好的算法对完成的笔试进行评分。 每答对一题得 1 分，测验分数为所获分数之和。对于最终计算，每个测试的分数以百分比表示。

The general, specific, practical and NDT instruction writing examination elements shall be graded separately. When conventional pre-prepared paper-based examinations are used, an examiner shall be responsible for the grading of the examinations by comparison with model answers. E-assessment systems that automatically score candidate responses against stored data and grade the completed written examination according to prepared algorithms may be used. Each correct reply scores 1 point and the mark attributed to the tests is the sum of the points obtained. For the final calculation, the mark of each test is expressed as a percentage.

7.2.5.2 实操考试的评分应以表 3 中的 1 至 3 项为依据，并使用依据适用的等级和方法推荐的权重系数。

The grading of the practical examination element shall be based on items 1 to 3 in Table 3, with the recommended weighting factors in relation to the level and method as applicable.

表 3 — 评分的科目和权重因子 — 实操考试

Table 3 — Subjects and weighting factors for grading — Practical examination element

项目 Item	科目 Subject	权重因子/Weight factor	
		1 级/Level 1 (%)	2 级/Level 2 (%)
1	NDT设备和NDT介质的知识 Knowledge of NDT equipment and NDT media.	20	10
2	NDT方法的应用 Application of NDT method	35	26
3	指示或不连续性的检测和报告 The detection of indications or discontinuities and reporting	45	64
总计 Total		100	100
注：表 D.1 给出了关于每个项目的详细指导，考官应予考虑。 NOTE Table D.1 gives guidance on additional details on each item, to be taken into account, as applicable by the examiner.			

7.2.5.3 有资格获得认证的 1 级候选人应在每项考试（通用、专业和实操）上获得至少 70% 的成绩。对于实操考试，每个测试的试样应获得至少 70% 的成绩。

For the Level 1 candidates to be eligible for certification, they shall obtain a minimum grade of 70 % on each examination element (general, specific and practical). For the practical examination element, a minimum grade of 70 % shall be obtained for each specimen tested.

7.2.5.4 CCIC 可以将一些不连续性列为强制性检出项目。

CCIC may classify some discontinuities as mandatory to be detected.

7.2.5.5 有资格获得 2 级认证的候选人应在每项考试（通用、专业、实操和 NDT 规程编写）上获得至少 70% 的成绩。对于实操考试，每个测试试样和 NDT 规程编写（如适用）的最低成绩应为 70%。 CCIC 可将某些不连续性列为强制性检出和评价为不可接受。NDT 规程编写应按照附录 D 进行评分。

For the Level 2 candidates to be eligible for certification, they shall obtain a minimum grade of 70 % on each examination element (general, specific, practical and NDT instruction writing). For the practical examination element, a minimum grade of 70 % shall be obtained for each specimen tested and NDT instruction writing element, as applicable. CCIC may classify some discontinuities as mandatory to be detected and evaluated as unacceptable. The NDT instruction writing element shall be graded in accordance with Annex D.

7.2.5.6 对于 AT，所需的测试规程可与实操考试没测试过的试样相关。

For AT, the required test instruction may relate to a specimen which is not tested during the practical examination element.

7.3 3 级考试内容和评分

Examination content and grading for Level 3

7.3.1 总则

General

任何 NDT 方法的 3 级认证的候选人均应成功完成（成绩≥ 70%）相关门类和方法的 2 级实操考试，但不包括为 1 级编写 NDT 规程。 在同一 NDT 方法和产品门类的 2 级获证人员，或已成功通过附录 A 中规定的行业门类的 NDT 方法的 2 级实操考试，可不再要求再次参加 2 级实操考试。 如果 3 级认证的方法和门类在 2 级认可范围以外，也没有参加过 2 级实操考试，此豁免不适用。

All candidates for Level 3 certification in any NDT method shall have successfully completed (with a grade of ≥ 70 %) the practical examination element for Level 2 in the relevant sector and method, except for the drafting of NDT instructions for Level 1. A candidate who is Level 2 in the same NDT method and product sector or who has successfully passed a Level 2 practical examination element for the NDT method in an industrial sector, as specified in Annex A, is exempt from passing again the Level 2 practical examination element. This exemption is only valid for the product sectors covered by the industrial sector concerned and, in any other circumstances, the relevant sector is the sector in which the candidate seeks Level 3 certification. This exemption does not apply if the NDT methods and sectors seeking Level 3 certification are outside the certification scope of the Level 2 and the practical examination for Level 2 has not been taken.

7.3.2 基础考试

Basic examination element

7.3.2.1 本笔试应按表 4 所示选择最少数量的多项选择题来评估候选人基础科目的知识。试题应以不可预知的方式从考试日期有效的 CCIC 的基础考试试题库中选择。

This written examination shall assess the candidate’s knowledge of the basic subjects using at least the number of multiple choice examination questions shown in Table 4. Examination questions shall be selected in an unpredictable way from CCIC’s collection of basic examination element questions valid at the date of examination.

表 4 – 基础考试试题要求的最少数量

Table 4 — Minimum required number of basic examination questions

项目 Item	题目 Subject	考题数 Number of questions
A	材料科学和工艺技术方面的技术知识 Technical knowledge in materials science and process technology.	25
B	根据本文件了解CCIC的资质和认证体系。 可以是开卷考试。 Knowledge of CCIC’s qualification and certification	10

	system based on this document. This may be an open-book examination.	
C	至少具备 2 级要求的四种方法的通用知识，并由候选人从本方案 1.2 中给出的方法中选择。这四种方法应包括至少一种体积法（UT 或 RT）。 General knowledge of at least four methods as required for Level 2 and chosen by the candidate from the methods given by clause1.2 of this scheme. These four methods shall include at least one volumetric method (UT or RT).	15 每种方法（总计 60） for each test method (total 60)
注：对于 C 项，受新技术和方法的影响，CCIC 可对相关方法调整试题数量。 NOTE For item C, CCIC may adjust the number of questions per method for methods impacted by evolving technology, increasing methods and techniques being added.		

7.3.2.2 建议先通过基础考试并保持有效，前提是在通过基础考试后的五年内通过第一个主要方法考试。 持有有效 3 级证书的考生无需重新参加基础考试

It is recommended that the basic examination element be passed first and remain valid, provided that the first main method examination element is passed within five years after passing the basic examination element. A candidate holding a valid Level 3 certificate is exempt from the need to retake the basic examination element.

7.3.3 主要方法考试

Main method examination element

本笔试应使用表 5 中所示的最低要求数量的多项选择题来评估候选人对主要方法科目的知识。 试题应以不可预测的方式从考试日期有效的 CCIC 试题库中选择。

This written examination shall assess the candidate's knowledge of the main method subjects using the minimum required number of multiple choice questions shown in Table 5. Examination questions shall be selected in an unpredictable way from the current collection of questions approved by CCIC at the time of the examination.

表 5 – 主要方法考试最少试题量

Table 5 — Minimum required number of main method examination questions

项目 Item	题目 Subject	考题数 Number of questions
D	与应用的 NDT 测试方法相关的 3 级知识。 Level 3 knowledge relating to the NDT test method applied.	30
E	NDT方法在相关门类的应用，包括适用的法规、标准、规范和程序。 这可以是关于法规、标准、规范和程序	20

项目 Item	题目 Subject	考题数 Number of questions
	的开卷考试。 Application of the NDT method in the sector concerned, including the applicable codes, standards, specifications and procedures. This may be an open-book examination in relation to codes, standards, specifications and procedures.	
F	在相关门类起草一项或多项NDT程序。 应给供候选人提供适用的法规、标准、规范和其他程序。 对于已在成功通过 3 级考试中起草 NDT 程序的候选人，CCIC可以用对涵盖相关方法和门类、包含错误和/或遗漏程序要求候选人进行分析。 Drafting of one or more NDT procedures in the relevant sector. The applicable codes, standards, specifications and other procedures shall be available to the candidate. For a candidate who has already drafted an NDT procedure in a successfully passed Level 3 examination, CCIC may replace the drafting of a procedure with the critical analysis of an existing NDT procedure covering the relevant method and sector, and containing errors and/or omissions.	-
应在考试前规定适用的辅助工具并告知考生。 CCIC 可提供这些辅助工具，用于开卷考试。 Applicable aids shall be specified and communicated to candidates before the examination. These aids may be provided by CCIC for use in open-book examinations.		

7.3.4 3 级考试评分

Grading of Level 3 qualification examinations

7.3.4.1 总则

General

基础考试和主要方法考试应分开评分。 要获得认证资格，候选人应同时通过基础考试和主要方法考试。

The grading of the basic and main method examination elements shall be done separately. To be eligible for certification, a candidate shall pass both the basic and main method examination elements.

对于基础考试的 A、B、C 三项和主要方法考试的 D、E 项，下列要求适用。

For the three items A, B, and C of the basic examination element and items D and E of the main method examination element, the following requirements apply.

采用传统的纸面考试时，由考官负责将考生的答案与 CCIC 批准的答案进行比较，对考试进行评分。 每答对一题得 1 分，测验分数为所获分数之和。 对于最终计

算，每个测试的分数以百分比表示。

When conventional pre-prepared paper-based examinations are used, an examiner shall be responsible for the grading of the examinations by comparing the replies given by the candidate against answer keys approved by CCIC. Each correct reply scores 1 point and the mark attributed to the tests is the sum of the points obtained. For the final calculation, the mark of each test is expressed as a percentage.

CCIC 可以选择使用电子评估系统，根据存储的数据自动对候选人的答题进行评分，并根据准备好的算法对完成的笔试进行评分。

At the option of CCIC, e-assessment systems that automatically score candidate responses against stored data and grade the completed written examination according to prepared algorithms may be used.

7.3.4.2 基础考试

Basic examination

为了通过基础考试，考生应在 A、B 和 C 各部分中获得至少 70% 的成绩。

In order to pass the basic examination, the candidate shall obtain a minimum grade of 70 % in each of parts A, B, and C.

7.3.4.3 主要方法考试

Main method examination

为通过主要方法考试，候选人应在 D、E 和 F 部分中各取得至少 70% 的成绩。

In order to pass the main method examination, the candidate shall obtain a minimum grade of 70 % in each of parts D, E, and F.

有关书面 NDT 程序的推荐权重，请参见表 D.3。

See Table D.3 for the recommended weighting of the written NDT procedure.

7.4 实施考试

Conduct of examinations

7.4.1 所有考试应在 CCIC 批准和监督的考试场所进行。

All examinations shall be conducted in examination premises approved and monitored by CCIC.

7.4.2 考试时，考生应持有有效的身份证明和正式的考试通知，并根据要求向考官或监考人员出示。

At the examination, the candidate shall have in his possession valid proof of identification and an official notification of the examination, which shall be shown to the examiner or invigilator upon demand.

7.4.3 任何候选人在考试过程中不遵守考试规则或有作弊行为或协助作弊，应在至少一年

的时间内不得参加所有后续的资格考试。

Any candidate who, during the course of the examination, does not abide by the examination rules or who perpetrates, or is an accessory to, fraudulent conduct shall be excluded from all further qualification examinations for a period of at least one year.

7.4.4 考试试题应由 CCI 确认。采用常规纸笔考试时，试卷须经考官和批准确认，并按照 CCIC 批准的程序进行评分。当候选人参加的“笔试”是在计算机上进行时，并使用电子考评系统对考试进行评分时，CCIC 应当对电子考评系统进行确认和批准。

Examination questions shall be validated by CCIC. When conventional pre-prepared paper-based examinations are used, the examination papers shall be validated and approved by an examiner, and the grading shall be done in accordance with procedures approved by CCIC. When e-assessment systems that select questions present the “written” examination to a candidate on a computer and grade the examinations are used, CCIC shall validate and approve the e-assessment system.

7.4.5 笔试（无论是电子评估还是传统纸面方式）和实操资格考试应由一名考官或者一名或多名受过培训的由 CCIC 负责的监考员进行监考。

Written (whether e-assessment or conventional) and practical qualification examinations shall be invigilated by an examiner or by one or more trained invigilators placed under CCIC’s responsibility.

7.4.6 经 CCIC 批准，参加实操考试的候选人可以使用自己的设备。

With the approval of CCIC, a candidate for a practical examination may use their own equipment.

7.4.7 考生不得携带个人物品进入考场，除非考官特别批准。

Candidates shall not be permitted to bring into the examination area personal items, unless specifically authorized to do so by the examiner.

7.5 补考

Re-examination

7.5.1 因违背行为准则而未通过的考生应至少等待 12 个月才能重新申请考试。

A candidate failing for reasons of unethical behavior shall wait at least 12 months before reapplying.

7.5.2 考生未能通过一项或多项考试（即通用、专业、实操等考试），重考未通过的考试的次数不得超过两次：

A candidate who fails one or more elements of an examination (i.e. general, specific, practical etc.) may retake the failed examination no more than twice:

a) 至少一个月后（如果可接受的进一步培训已圆满完成，该时间可能会缩短）；

after a minimum time of one month (which may be reduced if further training

acceptable to CCIC has been satisfactorily completed);

b) 不迟于初次考试后的两年。

no later than two years after the initial examination..

7.5.3 考生在一项或多项考试的两次补考未通过应完成 CCIC 承认的进一步培训，并被要求重新参加所有考试。

A candidate failing two re-examinations on one or more elements shall complete further training, acceptable to CCIC, and be required to retake all examination elements.

7.6 补充考试

Supplementary examinations

7.6.1 经认证的 1 级或 2 级个人更改门类或为相同的无损检测方法添加另一个门类，应参加新门类的专业和实操考试。2 级人员还应参加编写新门类的 NDT 指导书。

A certified Level 1 or Level 2 individual changing sectors or adding another sector for the same NDT method shall be required to take sector specific and practical examination elements for the new sector. Level 2 shall also be required to write the NDT instruction for the new sector.

7.6.2 经认证的 3 级人员变更门类或为同一 NDT 方法增加另一个门类，应参加主要方法考试中项目 E 和 F 的考试（见表 5）。

A certified Level 3 individual changing sectors or adding another sector for the same NDT method shall be required to take the sector specific items E and F of the main method examination element only (see Table 5).

8 认证

Certification

8.1 管理

Administration

符合所有条件的候选人应获得认证，CCIC 应提供该认证的证据。CCIC 将签发证书并在 CCIC 网站上显示相关认证信息。 证书应有防止伪造的措施。CCIC 拥有证书的所有权，获证人员有使用权。

A candidate fulfilling all conditions shall be certified and evidence of this certification shall be made available by CCIC. CCIC will issue certificate(s) and displaying the relevant certification information on CCIC's website. The certificate shall include a measure(s) to prevent falsification. CCIC has the ownership of certificates, and the certified personnel have the right to use them.

注：CCIC 将在公司网站上公布获认证人员的姓名、认证级别、认证范围和认证有效期的信息。被暂停或撤销认证后，CCIC 将从网站上删除相关认证信息。申请人提交认证申请，意味着申请人同意 CCIC 公布认证信息。

Note: CCIC will publish the certification information of certified persons, including names, the certification levels, the scope of certification and the validity period of the certification on the CCIC website. When the certification is suspended or revoked, CCIC will delete the relevant certification information from the website. When an applicant applies for certification, it means that the applicant agrees that CCIC can publish his/her certification information.

8.2 证书

Certificates

CCIC 出具的证书至少应包括以下信息：

Certificates issued by CCIC shall include the following information as a minimum:

a) 被认证人的姓名；

the name of the certified individual;

b) 唯一标识（一张照片和身份证号或同类证件）；

a unique identification (a photo and No. of ID or equivalent);

c) 认证范围，包括引用 ISO 9712、NDT 方法和认证级别，和/或适用的技术和门类，及获认证的日期；

the scope of the certification, including reference to ISO 9712, the NDT method(s) and level of certification, and/or applicable techniques and sector(s), including issue date;

d) 对认证的任何限制（如果适用）；

any limitations to the certification, if applicable;

e) 认证的生效日期和失效期；

the effective date of certification and date of expiry;

f) CCIC 指定代表的签字和/或批准；

the signature and/ or authorization of a designated representative of CCIC;

g) CCIC 用于验证人员认证状态的联络信息和所用数据库的网址。

contact information or website address of CCIC database for verification of any individual's certification status.

8.3 认证条件

Conditions of certification

8.3.1 总则

General

CCIC 授予、扩展范围、暂停、撤销或重新确认认证。 认证证书的最长有效期为 5 年。 证书持续的有效应有当前年度视力验证符合要求的信息支持，如 6.4 所述。

Certification is granted, extended, suspended, withdrawn or revalidated by CCIC. The maximum period of validity of the certificate is 5 years. To be valid, certificates shall be supported by a current annual verification of acceptable vision as per 6.4.

8.3.2 授予认证

Granting

在满足所有认证要求后，由 CCIC 授予认证。有效期自 CCIC 做出认证决定之日起计算。

Certification shall be granted by CCIC when all certification requirements are fulfilled. The period of validity shall commence upon the decision of certification by CCIC.

8.3.3 扩展范围

Scope extension

获证人员可以申请将认证范围扩展到其他门类或方法。认证过程与初始认证相同，但资格要求不同。申请人应提供在申请认证范围内的培训或经验证明。

The certified personnel can apply for extending the certification scope to other sectors or methods. The certification process is the same as the initial certification except the qualification requirements are different. The applicant should provide evidence of training or experience in the scope sought for certification.

一般情况下，可以在现有认证的基础上增加其他范围，并保持原有的有效期。在特殊情况下，CCIC 可酌情签发新的有效期的新证书。

Generally, the additional scope may be added to the existing certification and the original period of validity maintained. At the discretion of CCIC, a new certificate with a new period of validity may be issued for the extension to scope only for the extraordinary cases.

8.3.4 暂停认证

Suspension of certification

CCIC 可暂停认证：

Certification may be suspended by CCIC:

a) 如果个人因身体条件暂时无法履行职责；

if the individual becomes temporarily physically incapable of performing their duties;

b) 如果个人每年未能提供视力满足本方案要求的证据；

if the individual fails to provide evidence of meeting the visual acuity requirements of this document annually;

c) 如果个人获得认证的方法发生重大中断；

if a significant interruption takes place in the method for which the individual is certified;

d) CCIC 认定其他情况。

at the discretion of CCIC for any other situations.

8.3.5 撤销认证

Withdrawal of certification

CCIC 应撤销认证：

Certification shall be withdrawn by CCIC:

a) 经审查有与本认证方案不符或未遵守 CCIC 行为准则的行为证据后，由 CCIC 谨慎判断后；

at the discretion of CCIC, i.e. after reviewing evidence of behavior incompatible with the this certification scheme or failure to abide by Code of Conduct of CCIC;

b) 个人不符合续证条件，直至个人满足续证条件为止；

if the individual fails to meet the requirements of renewal, until such time as the individual meets the requirements for renewal;

c) 如果个人未能再认证，直到个人满足再认证或认证的要求为止；

if the individual fails recertification, until such time as the individual meets the requirements for recertification or certification;

d) 当从雇主处收到可核实的证据表明该个人的身体状况已无法履行其职责时，CCIC 谨慎判断后。

at the discretion of CCIC, when verifiable evidence is received from the employer stating that the individual has become physically incapable of performing their duties.

8.3.6 撤销后的认证

Certification after withdrawal

对于 8.3.5 a) 的情况，只能在至少 12 个月的等待期后才能获得认证。申请人应提供问题已解决，并至少有 2 名推荐人的确认。CCIC 将对证据进行评估后根据具体情况决定后续措施。

对于 8.3.5 d) 的情况下，CCIC 将根据具体情况决定申请人如何重新获得认证。

In case of 8.3.5 a), the certification can only be granted after a minimum 12 months waiting period. The applicant shall submit the evidence that the deficiency has been addressed successfully and confirmed by at least two referees. CCIC should assess the evidence and decide the subsequent actions case by case. In case of 8.3.5 d), CCIC will decide on a case-by-case basis how applicants can re-certified.

8.4 其他认证机构签发的证书

Certificates issued by other certification bodies

8.4.1 CCIC 可以根据 IAF MLA 签署方或等同机构 ISO/IEC 17024 认可的其他认证机构颁发的 NDT 认证证书授予认证。 申请人在申请 CCIC 认证时应提供以下文件:

CCIC may grant certification based on NDT certification certificates issued by another certification body who was accredited to ISO/IEC 17024 by an IAF MLA signatory or equivalent. The applicant shall provide the following documentation when applying for certification of CCIC:

- 完整填写的 CCIC 初始认证申请;

  A fully completed CCIC initial certification application;

- 提交给相关认证机构的初始申请和最新续证或再认证申请的副本，以及符合本认证要求的支持证据, 包括考试成绩证明以及考试日期

  A copy of original application and the latest renewal or recertification application with supporting evidence of meeting the certification requirements submitted to the relevant certification body, including evidence of examination results and examination dates.

8.4.2 授予的认证有效期与当前认证的有效期相同。 如果转移的认证在转移时到期，申请人需要向 CCIC 完成初始认证申请及续证或再认证申请。 根据认证的方法/门类的不同，CCIC 可能会要求申请人提供培训证明或参加考试。

The validity of certification granted will be the same as the expiry date of current certification. Should the certification being transferred be due to expire around the time of transfer, the applicant is required to complete an initial certification application to CCIC as well as a renew or recertification application. Dure to differences of certification methods/sectors, CCIC may require the applicant to provide further evidence of training or sit further examination.

8.4.3 不需要进行考试直接接受原认证的，新认证的有效期不得超过原认证的有效期，也不得扩大认证范围。

Where the prior certification is accepted without any additional examination, the expiry of the new certification shall not extend beyond that of the prior certification nor shall extend the scope of certification.

9 续证

Renewal

9.1 在认证和再认证后的有效期届满前，CCIC 应在提供以下证明时予以续证:

Prior to the completion of the period of validity following certification and recertification, certification shall be renewed by CCIC for a new period of validity on production of:

a) 在过去 12 个月内进行的满意结果的近视力检查文件证据；**和**

documentary evidence of a satisfactory near vision acuity examination taken within the preceding 12 months; and

b) 在过去 60 个月内进行的满意结果的色觉和/或灰度感知检查的文件证据；**和**

documentary evidence of a satisfactory color vision and/or grey scale perception examination taken within the preceding 60 months; and

c) 可验证的持续符合要求的工作活动的文件证据，而在申请续证的方法和门类中没有重大中断；

verifiable documentary evidence of continued satisfactory work activity without significant interruption in the method and sector for which certificate renewal is sought;

和以下任一要求：

and either:

d) 按照 10.2.2 成功完成了的实操考试，但应包含至少 50% 的 10.2.2 要求的考试试样；或者

successful completion of a practical examination element in accordance with 10.2.2 except that it shall consist of a minimum of 50 % of the examination specimens required by 10.2.2;

e) 成功满足 9.2 和附录 C 中给出的结构化学分体系的要求。

successfully meeting the requirements of the structured credit system as given in 9.2 and Annex C.

如果不满足续证准则 c)，个人应完成 10.2.2 要求的实操考试。

If the criterion c) for renewal is not met, the individual shall complete the practical examination elements required by 10.2.2.

9.2 候选人选择使用结构化学分体系时，应根据表 C.1 的要求，向 CCIC 提供证据，证明在 5 年的续证期内至少达到 100 分。

Where a candidate elects to use the structured credit system, they shall provide evidence to CCIC to demonstrate achievement of a minimum of 100 points in the 5 year renewal period based on the requirements of Table C.1.

9.2.1 对于寻求 1 级证书续证候选人，表 C.1 的 A 部分中列出的任何活动组合至少需要达到 100 分中的 75 分。

For candidates seeking renewal of Level 1 certificates, a minimum of 75 of the 100 points is required for any combination of activities listed in part A of Table C.1.

9.2.2 对于申请 2 级或 3 级证书续证的候选人，表 C.1 的 A 部分列出的任何活动组合至少需要 达到 100 分中的 50 分。

For candidates seeking renewal of Level 2 or 3 certificates, a minimum of 50 of the 100 points is required for any combination of activities listed in part A of Table C.1.

9.2.3 当候选人申请多份证书的续证时，为专业活动授予的分值可以应用于每张证书非特定方法的活动中（例如当前个人在 NDT 或 NDT 相关协会中的会员资格”），计入总分。 但是，候选人必须满足申请续期的每份证书所要求的总分（即 100 分）。

Where a candidate is seeking renewal for more than one certificate, points granted for a specific activity can be applied to the total points required for each certificate for those activities not specific to a particular method (e.g. “Current individual membership in NDT or NDT related society”). However, candidates shall meet the total number of points required (i.e. 100 points) for each certificate for which renewal is being sought.

9.3 获证人员有责任启动续证程序。

It is the responsibility of the certificate holder to initiate the procedure required for renewal.

9.3.1 换证申请应在证书有效期届满前向 CCIC 提出，不得迟于证书有效期届满后 12 个月。

The renewal application should be made to CCIC before the date of the expiration of the certification and shall be no later than 12 months after the date of expiration of the certificate.

9.3.2 若在证书到期前或到期日收到续证申请，新证书的换证日期应与证书到期日期相同（即不中断认证）。新证书的有效期自原证书有效期届满之日起不超过 5 年。

If the renewal application is received prior to or on the date of expiration of the certificate, the renewal date of the new certificate shall be the same as the date of expiration of the certificate (i.e. no interruption in certification). The date of expiration of the new certificate shall be no more than 5 years from the date of expiration of the original certificate.

9.3.3 如果在证书到期日之后收到续证申请，则新证书的续证日期应为满足续证各项要求的日期。在这种情况下，认证期间应有中断。新证书的有效期自原证书有效期届满之日起不超过 5 年。

If the renewal application is received after the date of expiration of the certificate, the renewal date of the new certificate shall be the date on which all requirements for renewal are met. In this case, there shall have been an interruption in the certification period. The date of expiration of the new certificate shall be no more than 5 years from the date of expiration of the original certificate.

9.4 更新证书的最长有效期为 5 年。

The maximum period of validity of the certificate at renewal is 5 years.

9.5 1 级和 2 级获证人不符合续证要求的，应满足 10.2.2 的再认证要求。 3 级获证人员不满足续证要求，应满足 10.3.1 中规定的再认证要求。

Certificate holders at Level 1 and Level 2 not meeting the requirements for renewal shall fulfil the requirements for recertification as specified in 10.2.2. Certificate

holders at Level 3 not meeting the requirements for renewal shall fulfil the requirements for recertification, as specified in 10.3.1.

10 再认证

Recertification

10.1 总则

General

10.1.1 在每第二个有效期结束前，获证个人应由 CCIC 再次认证，有效期不超过 5 年，前提是该个人符合 9.1 a) 和 9.1 b) 规定的续证准则，并符合下述适用的条件。

Prior to the completion of each second period of validity, the certified individual shall be recertified by CCIC for a new period of five years or less, provided the individual meets the criterion for renewal specified in 9.1 a) and 9.1 b) and meets the applicable conditions described in the following.

10.1.2 获证人有责任启动再认证程序。如果在有效期届满后超过 12 个月申请再认证，则需要再次通过 1 级和 2 级的完整考试（通用、专业和实操考试），3 级应再次通过主要方法考试（表 5，D、E 和 F)。

It is the responsibility of certificate holders to initiate the procedures required to obtain recertification. If the recertification is applied for more than 12 months after expiry of the period of validity, a complete examination (general, specific, and practical) for Level 1 and Level 2 and a main method examination element (Table 5, items D, E and F) for Level 3 shall again be passed successfully.

10.2 1 级和 2 级

Level 1 and 2

10.2.1 申请再认证的 1 级和 2 级获证人员应提供由雇主出具的在申请再认证的方法和门类的工作活动满足 10.2.2 要求，并且没有重大中断的确认记录。

Levels 1 and 2 certificate holders seeking recertification shall provide a confirmation issued by the employer of continued satisfactory work activity without significant interruption in the method and sector for which recertification is sought and satisfy 10.2.2.

10.2.2 个人应成功完成实操考试，证明其在证书规定的范围内具有持续开展工作的能力。这应包括适合于再认证范围的试样测试（见附录 B)。此外，对于 2 级人员，还应包括起草适合 1 级人员使用的书面规程（见 7.2.4.1)。 如果个人对于每个测试的试样未能达到至少 70% 的成绩（按照表 4 中的指导加权)，并且对于第 2 级人员的规程编写，应允许在再认证考试 7 天后和 12 个月内进行两次补考。

The individual shall successfully complete the practical examination element which demonstrates continued competence to carry out work within the scope specified on the certificate. This shall include testing specimens (see Annex B) appropriate to the scope of recertification and in addition, for Level 2, the production of a written instruction suitable for the use of Level 1 personnel (see 7.2.4.1). If the individual

fails to achieve a grade of at least 70 % for each specimen tested (weighted according to the guidance in Table 4), and, for Level 2, for the instruction, two re-examinations of the recertification examination shall be allowed after at least 7 days and within 12 months of the first attempt at the recertification examination.

10.2.3 允许的两次补考均不及格，证书将被撤销。 为了恢复认证，候选人应：

In the event of failure in the two allowable reexaminations, the certificate shall be withdrawn. In order to reinstate certification, a candidate shall:

– 完成进一步的培训，并被CCIC 接受； 和

complete further training, acceptable to CCIC; and

– 重新参加初始认证所需的所有考试。

– retake all examination elements required for initial certification.

恢复认证的证书有效期自原证书有效期届满之日起不超过 5 年。

The date of expiration of the reinstated certificate shall be no more than 5 years from the date of expiration of the original certificate.

10.2.4 如果不符合 10.2.1 中的再认证准则，个人应完成 10.1 要求的通用考试、专业考试和实操考试。

If the criterion in 10.2.1 for recertification is not met, the individual shall complete the general, specific and practical examinations required by 10.1.

10.3 3 级

Level 3

10.3.1 申请再认证的 3 级获证人员应提供由雇主出具的在申请再认证的方法和门类满足要求且没有重大中断的确认记录，并且：

Level 3 certificate holders seeking recertification shall provide a confirmation issued by the employer of continued satisfactory work activity without significant interruption in the method and sector for which recertification is sought and:

a) 满足 10.3.3 的 3 级笔试要求； 或者

satisfying the Level 3 requirements of 10.3.3 for a written examination; or

b) 满足 10.3.2 和表 C.1 中给出的结构化学分体系的要求。

meeting the requirements for a structured credit system, as given in 10.3.2 and Table C.1.

个人应自己决定是参加认证考试还是使用学分体系。 如选择学分体系并要求提交雇主文件或进入雇主场所的，个人应向 CCIC 提供雇主的书面同意的声明。

The individual shall decide between the examination or credit system for recertification. If the credit system is chosen and requires submission of employer's documents or access to an employer's premises, the individual shall provide to CCIC a written statement of approval from the employer.

在这两种情况下（笔试或学分体系），个人应提供 CCIC 可接受的适当书面证据，证明其在相关方法的持续实操能力，或通过 10.2.2 中规定的 2 级实操考试，不包括起草 NDT 规程。

In both cases (written examination or credit system), the individual shall either provide appropriate documented evidence, acceptable to CCIC, of their continued practical competence in the method or pass a Level 2 practical examination, as specified in 10.2.2, except for the drafting of NDT instructions.

10.3.2 获证人员选择使用结构化学分体系，应根据表 C.1 的要求向 CCIC 提供证据，证明在 5 年的再认证期内至少达到 100 分。

Where a certificate holder elects to use the structured credit system, they shall provide evidence to CCIC to demonstrate achievement of a minimum of 100 points in the 5 year recertification period based on the requirements of Table C.1.

10.3.3 对于申请再认证 的 3 级获证人员：

For certificate holders seeking recertification of Level 3 certification:

- 表 C.1 中 A 项所列活动的任何组合都需要 100 分中获得最低 50 分和最高 70 分； 和

  a minimum of 50 and a maximum of 70 of the 100 points is required for any combination of activities listed in item A of Table C.1; and

- 表 C.1 中 B 项所列活动的任何组合都需要 100 分中获得最低 30 分和最高 50 分。

  a minimum of 30 and a maximum of 50 of the 100 points is required for any combination of activities listed in item B of Table C.1.

10.3.4 获证人员选择参加笔试或者不符合结构化学分体系要求的，应成功通过考试，包括：

Where a certificate holder elects to take the written examination or does not meet the structured credit system requirements, they shall successfully complete an examination that includes:

a) 至少 20 道关于测试方法在相关门类中应用的多项选择题，表明对当前 NDT 技术、标准、法规或规范以及应用技术的理解； 和

   a minimum of 20 multiple-choice questions on the application of the test method in the sector(s) concerned which demonstrates an understanding of current NDT techniques, standards, codes or specifications, and applied technology; and

b) 至少 10 道关于 CCIC 认证方案要求的多项选择题。

   a minimum of 10 multiple-choice questions on the requirements of CCIC's certification scheme.

10.3.5 如果人员在再认证考试中成绩未达到 70%，则最多允许两次再认证考试。 除非 CCIC 另行延长，所有测试的时间期限为 12 个月。

If the individual fails to achieve a grade of at least 70 % in the recertification examination, a maximum of two retests of the recertification examination shall be allowed. The time period within which all tests are to be taken shall be 12 months, unless otherwise extended by CCIC.

10.3.6 允许的两次复试均未通过，证书将被撤销。 为了恢复认证，候选人应：

In the event of failure in the two allowable re-examinations, the certificate shall be withdrawn. In order to reinstate certification, a candidate shall:

- 完成进一步的培训，并被 CCIC 接受； 和

  complete further training, acceptable to CCIC; and
- 按照初次认证的要求重新参加所有主要方法检查项目。

  retake all main method examination items as required for initial certification.

10.3.7 候选人申请但不符合学分体系要求，应按照 10.3.3 进行再认证。 第一次再认证考试未通过，自申请通过结构化学分体系再认证之日起 12 个月内，仅允许参加一次再认证考试。

A candidate who applies for and does not meet the requirements of the credit system shall be recertified in accordance with 10.3.3. In the event of failure at the first attempt at recertification by examination, only one retest of the recertification examination shall be allowed within 12 months of the date of application for recertification via the structured credit system.

11 文档

Files

11.1 CCIC 应负责维持：

CCIC shall be responsible for the maintenance of:

a) 根据等级、NDT 方法和门类进行分类的所有获证人员的清单或数据库；

an actual list or database of all certified individuals classified according to level, NDT method and sector;

b) 每个未获得认证的候选人的个人档案，自申请之日起保存至少五年；

an individual file for each candidate who has not been certified, for at least five years from the date of application;

c) 每个获证人员和认证失效人员的个人文档，包含：

an individual file(s) for each certified individual and for each individual whose certification has lapsed containing:

1) CCIC 创建的唯一个人识别码；

a unique personal identifier created by CCIC;

2) 申请表；

application forms;

3) 考试记录，如问卷、答案、试样说明、记录、测试结果、NDT 程序和成绩单；

examination records, such as questionnaires, answers, description of specimens, records, results of test, NDT procedures, and grade sheets;

4) 续证和再认证文件，包括视力和持续工作活动的证据；

renewal and recertification documents, including evidence of visual acuity and continuous work activity;

5) 撤销认证的原因。

reason(s) for any withdrawal of certification.

11.2 只要证书仍然有效，并且在认证失效后至少一个完整的认证周期内，个人档案应在适当的安全和保密条件下保存。

Individual files shall be kept under suitable conditions of safety and confidentiality for as long as the certificate remains valid and for at least one full certification cycle after the certification has lapsed.

注：不需要对样本、数据集或射线照片进行归档。

NOTE The archiving of specimen, data sets or radiographs is not required.;

12 过渡期

Transition period

12.1 本条款的目的是在 CCIC 将认证计划应用于尚未涵盖的 NDT 方法或创建新门类时允许启动系统。 CCIC 可以在新方法或新门类实施之日起不超过五年的期限内，临时任命具有适当资格的人员担任考官，以实施、监督考试并评分。 CCIC 不得将五年实施期作为对不符合本方法所有资格和认证要求的候选人进行认证的手段。 当需要新方法或门类的附加培训时，当前获证人员应在下一个再认证周期提供完全合规的书面证据。

The aim of this clause is to permit the initiation of the system when CCIC applies the certification scheme to an NDT method, which is not yet covered within its scheme or when a new sector is created. CCIC may temporarily appoint, for a period not exceeding five years from the date of implementation of the new method or sector, duly qualified personnel as examiners for the purpose of conducting, supervising and grading the examinations. The five-year implementation period is not to be used by CCIC as a means to certify candidates who do not meet all the qualification and certification requirements of this document. When new/additional training requirements of the new method or sector are adopted, currently certified personnel shall provide documented evidence of full compliance at the next recertification cycle.

12.2 具有适当资格的人员是指以下人员：

Duly qualified personnel means that such personnel:

a) 了解 NDT 的原理，并有与该门类相关的专业知识；

have the knowledge of the principles of NDT and the specific knowledge in relation to the sector;

b) 具有应用 NDT 方法的行业经验；

have industrial experience of the application of the NDT method;

c) 有能力实施考试；

have the ability to conduct examinations;

d) 能够解释问卷和考试结果。

be able to interpret the questionnaire and results of examinations.

12.3 在任命之日起两年内，这些考官应通过满足 10.3.1 中所述的再认证要求获得认证。

Within two years of the date of appointment, these examiners shall have gained certification by satisfying the requirements for recertification as described in 10.3.1.

13 投诉和申诉

Complaints and appeals

所有设诉和申诉将按 CCIC 网站上公布的投诉和申诉处理程序进行处理。

All complaints and appeals will be managed in accordance with the procedure for handling complaints and appeals which is available on CCIC website.

附录/Annex A

NDT 人员认证方法与门类

Methods and Sectors of NDT Personnel Certification

(规范性/normative)

CCIC 为以下方法和门类提供认证。 这并不排除未来发展其他部门以满足客户、市场或监管需求。

CCIC delivers certification for the following methods and sectors. This does not preclude the development of additional methods or sectors to satisfy the needs of customers, market or regulators in the future.

序号 No.	NDT 方法 NDT Method	门类 Sector	级别 Level
1	UT (PAUT/TOFD)	焊接 Welds	1, 2 & 3
		锻件 Forges	
		铸件 Castings	
		管道 Tubes	
		复合材料 FRP	
2	RT (CR/DR)	焊接 Welds	1, 2 & 3
		铸件 Castings	
3	MT (MT-FL)	焊接 Welds	1, 2 & 3
		锻件 Forges	
		铸件 Castings	
		管子 Tubes	
4	PT	焊接 Welds	1, 2 & 3
		锻件 Forges	
		铸件 Castings	
		管子 Tubes	
5	VT	焊接 Welds	1, 2 & 3
		锻件 Forges	
		铸件 Castings	
		管子 Tubes	
6	ET （ET-ACFM）	焊接 Welds	1, 2 & 3
		锻件 Forges	
		铸件 Castings	
		管子 Tubes	
7	LT	压力法 （LT-P）	1, 2 & 3
		示踪气体法（LT-TG	

附录 B

实践考试 1 级和 2 级的最小试样数量和类型

Annex B

Minimum Number and Type of Specimens for the Level 1 and Level 2 Practical Examination Element

(规范性/normative)

a) 对于所有实践考试，应要求考生测试一个或多个特定门类的样本。

For all practical examination elements, candidates shall be required to test one or more sector specific specimen.

b) 如果要求考生测试多个试样，每个试样的特性应不同，即产品形式、材料规格、形状、尺寸或不连续类型。

If the candidate is required to test more than one specimen, each specimen shall be different in character, i.e. in product form, material specification, shape, size, or discontinuity type.

c) 数据集的评估和解释应被视为等同于测试一个样本。

The evaluation and interpretation of a data set shall be considered as equivalent to testing one specimen.

d) 对于一个产品门类，相关的实践考试要素：应要求考生至少测试两个样品，对于多个产品门类，每个产品门类至少测试一个。

For a product sector related practical examination elements: candidates shall be required to test a minimum of two specimens and for multiple product sectors, a minimum of one from each product sector.

e) 对于与工业门类，相关的实践考试：应要求考生测试至少两个代表工业门类通常测试的产品样本。

For an industrial sector related practical examination elements: candidates shall be required to test at least two specimens, representative of products typically tested in the industrial sector.

f) 对于 RT 考生：1 级和 2 级考生应至少对两个试样进行射线照相。已被认证为 1 级的 2 级候选人应至少对一个样本进行射线照相。

For RT candidates: Level 1 and Level 2 candidates shall radiograph at least two specimens. Level 2 candidates, already certified as Level 1, shall radiograph at least one specimen.

除了拍摄射线照片外，2 级考生还应评定一组至少 10 幅胶片图像或 10 幅数字射

线照片图像。该组应被视为一个样本。

In addition to taking radiographs, Level 2 candidates shall interpret a set of at least 10 film images or 10 digital radiographic images. This set shall be considered as one specimen.

g) 对于 LT 考生：考试应包括压力变化和示踪气体技术的检查，每个技术至少测试一个试样。

For LT candidates: an examination involving both pressure change and tracer gas technique shall include at least one specimen for each technique.

h) 当所寻求的认证在应用中有局限时，例如，测厚、射线评定或自动检测，试样的最小数量最多可减少 50% 至每个门类一个。

When the certification sought is limited in application, for example, thickness measurement, radiographic interpretation or automated testing, the minimum number of specimens may be reduced by up to 50 % to one per sector.

附录 C /Annex C

1 级、2 级和 3 级续证以及 3 级再认证的结构化学分体系

Structured Credit System for Renewal Level 1, 2 and 3 and for Level 3 Recertification

(规范性/normative)

C.1 总则

General

表 C.1 - 1 级、2 级和 3 级续证和 3 级再认证的结构化学分体系
Tabel C.1 - Structured credit system for renewal Level 1, 2 and 3 for Level 3 recertification

		1 级 Level 1			2 级 Level 2			3 级 Level 3		
项目 Item	活动 Activity	分数/活动 Points granted per activity	每年活动最高分值 Max Number of points per year of activity	5 年最高分值 Max number of points over 5 years of activity	分数/活动 Points granted per activity	每年活动最高分值 Max Number of points per year of activity	5 年最高分值 Max number of points over 5 years of activity	分数/活动 Points granted per activity	每年活动最高分值 Max Number of points per year of activity	5 年最高分值 Max number of points over 5 years of activity
	A 部分 Part A									
1	NDT 活动 Performance of NDT Activities [a]	2/day	25	95	2/day	25	95	2/day	25	95
2	完成方法理论培训 Completion of theoretical training in the method	1/day	5	15	1/day	5	15	1/day	5	15
3	完成方法实操培训 Completion of practical training in the method	2/day	10	25	2/day	10	25	2/day	10	25
4	NDT 相关方法实操或理论培训授课 Delivery of practical or theoretical training in NDT in the method considered	N/A	N/A	N/A	1/day	15	75	1/day	15	75
5	参与 NDT 领域或 NDT 工程的研究活动（见附录 E） Participation in research activities in NDT field or for engineering of NDT (see Annex E)	1/week	15	60	1/week	15	60	1/week	15	60
	B 部分 Part B									
6	参加方法或技术领域的技术研讨会/论文 Participation to a technical seminar/paper in the field of the method or technique	1/day	2	10	1/day	2	10	1/day	2	10
7	在方法或技术领域技术研讨会发言/发表论文 Presenting a technical seminar/paper in the field of the method or technique	1/presentation	3	15	1/presentation	3	15	1/presentation	3	15

		1 级 Level 1			2 级 Level 2			3 级 Level 3		
项目 Item	活动 Activity	分数/活动 Points granted per activity	每年活动最高分值 Max Number of points per year of activity	5 年最高分值 Max number of points over 5 years of activity	分数/活动 Points granted per activity	每年活动最高分值 Max Number of points per year of activity	5 年最高分值 Max number of points over 5 years of activity	分数/活动 Points granted per activity	每年活动最高分值 Max Number of points per year of activity	5 年最高分值 Max number of points over 5 years of activity
8	当前 NDT 或 NDT 相关协会的个人会员资格 Current individual membership in NDT or NDT related society	1/membership	2	15	1/membership	3	15	1/membership	3	15
9	相关方法对 NDT 人员/受训人员进行技术监督和指导 Technical oversight and mentoring of NDT personnel/ trainee in the relevant method	N/A	N/A	N/A	2/mentee	10	30	2/mentee	10	40
10	参加或召集标准化和技术委员会 Participation or convenorship in standardization and technical committees	N/A	N/A	N/A	1/committee	3	15	1/committee	4	20
11	在认证机构中履行 NDT 技术职责 Performing a technical NDT role within a certification body	N/A	N/A	N/A	2/activity	10	30	2/activity	10	40

注：在本表中注明“年”一词时，它被指定为认证年，而不是日历年。
a 有关此活动的具体细节，请参见 C.2。
NOTE Where the term “year(s)” is noted in this table, this is specified as a certification year and not as a calendar year.
a See C.2 for specific details of this activity.

C.2 实施 NDT 活动

Performance of NDT activities

C.2.1 在评估此类活动时，CCIC 应考虑 4.5 中规定的雇主责任和第 5 条中规定的职责。以下工作活动被视为可接受：

In assessing this activity type, CCIC should consider the responsibilities of employers as specified in 4.5 and the duties specified in Clause 5. The following work activities may be considered as acceptable:

a) 了解和理解客户的规范和检验标准；
knowledge and understanding of the customer's specifications and the inspection standards;
b) 验证操作条件或测试设备的设置、NDT 的成功执行、令人满意的报告；
verification of operating conditions or setting up of the test equipment, successful performance of NDT, satisfactory reporting;
c) 作为 3 级考官工作。
performance as a Level 3 examiner.

C.2.2 为了评估 C.2.1 中规定的活动，CCIC 要求申请续证或或 3 级再认证人员提交符合性的文件和/或证据，包括但不限于以下内容：

In order to assess the activities specified in C.2.1, CCIC requests from the individual seeking renewal or Level 3 recertification documentation and/or evidence to demonstrate compliance including, but not limited to, the following:

a) 经认证的个人或推荐人对候选人工作活动的确认；
confirmation of the candidates work activities by a certified individual or referee;
b) 确认给定方法中个人的活动级别；
confirmation of the level of activity of the individual in the given method;
c) 对给定方法中的正式形成文件的能力或能力验证的确认；
confirmation of formal documented competency or proficiency test(s) in the given method;
d) 报告的日期和协议编号；
dates and protocol numbers of reports;
e) 接受的岗位专业培训的详细信息；
details of any job specific training received;
f) 雇主的操作授权确认；
confirmation of employer's authorization to operate;
g) 活动和输出的总结；
summary of activities and outputs;
h) 工作/职位描述；

job/position description;

i) 年度/定期雇主绩效/能力评审；
annual/regular employer assessments of performance/competence;

j) 样品 NDT 报告；
sample NDT reports;

k) 开发的样品程序（仅限第 3 级）；
sample procedure(s) developed (Level 3 only);

l) 客户反馈；
customer feedback;

m) 由雇主确认其遵守道德规范；
confirmation of adherence to code of ethics from employer;

n) 确认符合其他的国家要求（即辐射安全）。
confirmation of compliance with additional national requirements (i.e. radiation safety).

其他证据可能被接受或被 CCIC 要求。 CCIC 要求提交的部分或全部证据必须得到雇主的确认。

Other evidence may be deemed acceptable or be requested CCIC. CCIC requires that some or all of the submitted evidence be confirmed by the employer.

附录 D 实操考试评分

Annex D Grading Practical Examination

(规范性/normative)

D.1：1 级和 2 级实操考试的评分 - 百分权重

D.1 Grading of Level 1 and Level 2 practical examination — percentile weighting

项目 Item	主题 Subject	加权因子 Weighting factor	
		1 级 % Level 1	2 级 % Level 2
1	**NDT 设备和媒介的知识** **Knowledge of NDT equipment and NDT media.**		
a)	系统和/或媒介知识和控制 system and/or media knowledge and control;	10	5
b)	验证和/或媒介的有效性 validity of verifications and/or media.	10	5
总计 Total		20	10
2	**NDT 方法应用** **Application of NDT method**		
a)	试样的制备（即表面状况），包括目视检查； Preparation of the specimen (i.e. surface condition), including visual examination;	5	2
b)	对于第 2 级，NDT 技术的选择和操作条件的确定； for Level 2, the selection of the NDT technique and determination of operating conditions;	n/a	10
c)	无损检测设备的设置和测试的执行； setting up of the NDT apparatus and performance of the test;	25	12
d)	测试后程序（即去磁、清洁、保存）。 post test procedures (i.e. demagnetization, cleaning, preservation).	5	2
总计 Total		35	26
3	**指示或不连续性的检测和报告** **The detection of indications or discontinuities and reporting**		
a)	检测强制性报告指示； detection of mandatory reportable indications;	20	18
b)	显示特征（如果适用于测试方法：类型、位置、方向、表观尺寸等）； characterization of indications (if applicable with	15	18

项目 Item	主题 Subject	加权因子 Weighting factor	
		1 级 % Level 1	2 级 % Level 2
	respect to the test method: type, position, orientation, apparent dimensions, etc.);		
c)	针对代码、标准、规范或程序标准的 2 级评估； Level 2 evaluation against code, standard, specification or procedure criteria;	n/a	18
d)	测试报告的制作。 production of the test report.	10	10
总计 Total		45	64
项目 1/2/3 总计 Total of item 1, 2 &3		100	100

D.2 2 级书面考试评分

Grading of Level 2 writing examination elements

表 D.2： 2 级 NDT 规程编写考试的百分权重

Table D.2—Percentile weighting for NDT instruction writing examination element for Level 2

NDT 规程编写 NDT Instruction writing (Level 2 candidates)		最大% % max
a)	前言（范围、参考文件） Forward (scope, reference documents)	5
b)	人员 Personnel	5
c)	所用的设备/媒体 Equipment/media t be used	5
d)	产品（描述或图纸，包括感兴趣的领域和测试的目的） product (description or drawing, including area of interest and purpose of the test)	10
e)	检测条件，包括检测准备 test conditions, including preparation for testing	10
f)	检测实施的详细说明，包括设置 detailed instructions for application of the test, including settings	40
g)	检测结果的记录和分类 recording and classifying of the test results	20
h)	报告结果 reporting the results	5
总分/Total		100

D.3 3 级主要方法考试 F 项权重

Weighting of Level 3 main method examination element item F

表 D.3：3 级 NDT 程序考试的百分权重

Table D.3 — Percentile weighting for the Level 3 NDT procedure examination

主题/Subject	% 最大/Max
项目 1--通用 **Item 1 -General**	
a)范围（适用领域，产品） scope (field of application, product);	2
b) 文件控制 document control;	2
c)规范性引用文件和补充信息 normative references and complementary information	4
小计 Sub-total	8
项目 2--NDT 人员 **Item 2 — NDT personnel**	2
项目 3 -- 材料和设备 **Item 3 — Materials and equipment:**	
a)主要 NDT 设备（包括规定验证状态和检测前功能核查） main NDT equipment (including defining verification status and pre-test serviceability checks);	10
b)辅助设备（参考和校准规、易耗吕、测量设备、观测辅助工具等） ancillary equipment (reference and calibration blocks, consumables, measuring equipment, viewing aids, etc.).	10
小计 Sub-total	20
项目 4 --试样 **Item 4 — Test piece**	
a) 物理条件和表面处理（温度、通道、保护涂层的去除、粗糙度等）； physical condition and surface preparation (temperature, access, removal of protective coatings, roughness, etc.);	1
b) 对待测面积或体积的描述，包括参考基准； description of area or volume to be tested, including reference datum;	1
c) 寻求的不连续性 discontinuities sought.	3
小计 Sub-total	5
项目 5 -- 检测 **Item 5 — Performance of the test:**	
a) 使用的 NDT 方法和技术 NDT method(s) and technique(s) to be used;	10

主题/Subject	% 最大/Max
b) 设置仪器 setting up the apparatus;	10
c) 实施检测（包括参考 NDT 规程） conducting the test (including reference to NDT instructions);	10
d) 不连续性的表征 characterization of discontinuities.	10
小计 Sub-total	40
项目 6 --接受准则 **Item 6 — Acceptance criteria**	7
项目 7 -- 检测程序 **Item 7 — Post-test procedure:**	
a) 不合格产品的处置（标签、隔离）； disposition of non-conforming product (labelling, segregation);	2
b) 保护涂层的修复（如果需要） restoration of protective coatings (where required).	1
小计 **Sub-total**	3
项目 8 --编制检测报告 **Item 8 — Production of the test report**	5
项目 9 --整体展现 **Item 9 — Overall presentation**	10
总计 **Total**	100

附录 E NDT 工程

Annex E Engineer of NDT

(信息性/informative)

E.1 定义

Definition

NDT 工程涵盖与 NDT 相关的所有活动，从设备的设计到属于工业或技术安装的相同设备的 NDT的准备、实施和验证（在制造和服务中）的责任。

Engineering of NDT covers all the activities linked to NDT, from the design of the equipment to the responsibility of preparation, implementation and verification of NDT (in manufacturing and in service) of the same equipment belonging to industrial or technical installations.

E.2 涵盖的活动的清单（未穷尽所有）

Non-exhaustive list of activities covered

The activities covered include:

涵盖的活动包括:

a) 在设计阶段，规定在设备制造过程中，如果适用，使用过程中应考虑的要求和/或检查的验证，；

at design stage, definition of requirements to be taken into account and/or verification of inspectability during manufacturing and, where applicable, in service, of equipment;

b) 选择在制造和/或服务中实施的NDT技术；

selection of NDT techniques to be implemented in manufacturing and/or in service;

c) 不同法规和标准的具体规定比较；

comparison of specific prescriptions of different codes and standards;

d) NDT 程序的建立或确认；

establishment or validation of the NDT procedures;

e) NDT供应商的技术评价；

technical evaluation of NDT suppliers;

f) 评价NDT技术，特别是在专业知识范围内；

evaluation of NDT techniques, notably in the frame of expertise;

g) 不合格的处理（技术评价）；

treatment (technical evaluation) of non-conformity;

h) 向顾客以及在适用的情况下向相关安全管理机构说明实施安排；

justification to the customers and where applicable, to the associated safety authorities, of practices implemented;

i) NDT 设施的管理责任；

responsibility for an NDT facility;

j) NDT 人员活动的协调和监督；

co-ordination and supervision of NDT personnel activities;

k) 鉴定——NDT技术的确认：

qualification — validation of NDT techniques:

1) 建立输入信息，包括检查目标；

establishment of input information’s including the inspection objectives;

2) 为公开测试和必要时盲测规定必要的模型；

definition of the necessary mocks-up for open and, where necessary, blind tests;

3) 实际测试；

implementation of practical tests;

4) 准备技术论证，包括必要时的建模；

preparation of technical justification including when necessary, modelling;

5) NDT程序的准备或验证；

preparation or validation of NDT procedures;

6) 资质档案的编制或确认；

preparation or validation of qualification dossiers;

l) 为工业安装制定在役检查方案或规定制定此类方案的规则。

establishment of in-service inspection programmes for industrial installations or definition of rules for the establishment of such programmes.

附录 F 对技术的培训要求

Annex F Training requirements for techniques

(信息性/informative)

F.1 总则

General

本附录考虑了在 NDT 方法框架内新开发的 NDT 技术的日益使用。 本附录还旨在为这些技术能力的日益增长的需求提供指导。

This annex considers the increasing use of NDT techniques developed in the framework of an NDT method. This annex is also intended to provide guidance for an increasing request for competency in those techniques.

本附件中包含的 NDT 技术的选择并不意味着全面或排他性，因此，本附录对未来的新技术留有空间，特别是那样未来使用越来越说话算数的技术。

The selection of NDT techniques included in this annex is not meant to be comprehensive nor exclusive and, therefore, leaves room for future techniques when their use becomes significant for inclusion in the annex.

直接申请 2 级需要的培训时间是在每个表中 1 级和 2 级的总天数。直接申请 3 级的培训时间是表中 1、2 和 3 级的总培训天数。

Direct access to Level 2 requires the total training days shown in each table for Levels 1 and 2. Direct access to Level 3 requires the total training days shown in the tables where applicable for Levels 1, 2, and 3.

N/A 表示不适用。

N/A means not applicable.

F.2 对技术建议的额外培训天数

F.2 Recommended additional training days for techniques

F.2.1 总则

General

表 F.1 至 F.4 中所示技术的培训要求是对表 1 中所示方法的培训要求的补充。

The training requirements for the techniques shown in Tables F.1 to F.4 are in addition to those for the method shown in Table 1.

注意 为方便起见，表 1 中的基本方法的培训要求复制在表 F.1 到 F.3 的第一行中。

Note The training requirements for the base methods from Table 1 are reproduced in the first line of Tables F.1 to F.3 for convenience.

F.2.2 有效性

Validity

只要主方法中的证书有效，技术的认证就有效。

Certification in a technique is valid as long as the certificate in the main method is valid.

表 F.1 — 泄漏测试 (LT) 技术附加培训要求

Table F.1 — Leak testing (LT) techniques additional training requirements

技术 Technique	缩略语 Abbreviated term	培训要求（天数） Training requirements (days)		
		1 级 Level 1	2 级 Level 2	3 级 Level 3
LT (如表 1) LT as per table 1)		5	9	6
LT 压力方法 LT pressure method	LT-P	3	4	N/A
LT 示踪气体法 LT tracer gas method	LT-TG	2	5	N/A

表 F.2 — 磁力测试 (MT) 技术附加培训要求

Table F.2 — Magnetic testing (MT) techniques additional training requirements

技术 Technique	缩略语 Abbreviated term	培训要求（天数） Training requirements (days)		
		1 级 Level 1	2 级 Level 2	3 级 Level 3
MT（如表 1） MT (as per table 1)		3	2	4
通量泄漏 Flux lekage	MT-FL	1	2	N/A

表 F.3 — 超声检测 (UT) 技术附加培训要求

Table F.3 — Ultrasonic testing (UT) techniques additional training requirements

技术 Technique	缩略语 Abbreviated term	培训要求（天数） Training requirements (days)		
		1 级 Level 1	2 级 Level 2	3 级 Level 3
UT(如表 1) UT (as per table 1)		8	10	5
飞行时间 Time of flight	UT-TOFD	5	5	N/A
相控阵 Phased array	UT-PA	5	5	N/A

表 F.4 — 超声波检测 (UT) 技术的附加先决条件

Table F.4 — Ultrasonic testing (UT) techniques additional prerequisites

技术 Technique	1 级 Level 1	2 级 Level 2	3 级 Level 3
UT-TOFD	UT1	UT2	N/A
UT-PA	UT1	UT2	N/A
注：表中规定的等级是最低可接受的认证等级。3 级证书持有者满足此要求。 NOTE The level stated in the table is the minimum acceptable level of certification. A Level 3 certificate holder satisfies this requirement.			

F.3 推荐的射线照相检测 (RT) 技术总培训天数

Recommended total training days for radiographic testing (RT) techniques

F.3.1 总则

General

表 F.5 和 F.6 中所示技术的培训要求是所指的 RT 技术认证所需的总培训天数。

The training requirements for the techniques shown in Tables F.5 and F.6 are the total training days required for certification in the RT technique noted.

F.3.2 有效性

Validity

一项技术的认证，只要主要方法的证书有效，就有效，但范围有限的技术除外。
Certification in a technique is valid as long as the certificate in the main method is valid, except for techniques with limited scope.

技术 Technique	有限范围的技术 Technique with limited scope	缩略语 Abbreviated term	培训要求（天数） Training requirements (days)		
			1 级 Level 1	1 级 Level 1	1 级 Level 1
片子&数字 Film & Digital		RT-FD	8	10	8
片子 Film		RT-F	5	10	5
数字 Digital		TR-D	5	10	5
CT 检查 Computed tomography		RT-CT	4	5	5
射线透视 Radioscopy		RT-S	4	4	5
	RT 片子解释 RT Film interpretation	RT-F1	N/A	8	N/A
	RT 数字图像判读 RT digital image interpretation	RT-D1	N/A	8	
	RT 片子和数字图像解释 RT film and digital image interpretation	RT-FDI	N/A	9	

注： 目前，表 1 中显示的 RT 培训主要是胶片射线照相（RT-F）。

NOTE At the present time, training shown in Table 1 for RT is mainly film radiography (RT-F).

当培训大纲与 ISO/TS 25107 中的建议一致时，需要考虑几种情况，RT 包括胶片和数字射线照相 (RT-FD)。

When the training syllabi are in agreement with the recommendations in ISO/TS 25107, several situations are to be considered, RT including then film and digital radiography (RT-FD).

F.3.3 胶片到数字转换的额外培训要求

F.3.3 Additional training requirements for film to digital transition

持有 RT-F 证书并申请 RT-D 认证的候选人需要接受额外的培训，如表 F.6 所示。
Candidates holding an RT-F certificate and seeking certification in RT-D need to have additional training, as shown in Table F.6.

表 F.6 — RT-F 到 RT-D 的附加培训要求

Table F.6 — Additional training requirements for RT-F to RT-D

方法 Method	技术 Technique	缩略语 Abbreviated term	1 级 Level1	2 级 Level 2	3 级 Level 3
RT	数字射线照相 Digital radiography	RT-D	3 天 3 days	5 天 5 days	3 天 3 days

修订历史

Revision history

版本/Version	发布日期 Issue date	实施日期 Imp Date	主要变化 Main change
Version/版本：2022 Revision/修订： 00	2022-4-1	2022-4-1	
Version/版本：2022 Revision/修订： 01	2022-8-1	2022-8-1	修订附录 A Revise the appendix A
Version/版本：2022 Revision/修订： 02	2023-6-1	2023-10-1	修订附录 A Revise the appendix A
Version/版本：2022 Revision/修订： 03	2023-12-1	2023-12-1	修订附录 A Revise the appendix A