UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

AUG 03 1993

Docket No. 99900041

Mr. Robert Voin
Vice President Quality
FRAMATOME
Tour Fiat
CEDEX 16 - 92084
La Defense
Paris, France

Dear Mr. Voin:

Thank you for your letter dated May 24, 1993, in which you informed us of organizational changes to the Framatome Topical Report, QP/85.0782 NP Revision 5A. Based on our review, we have determined that these changes are acceptable.

We request that you continue to keep us informed of proposed changes to your quality assurance program defined in the referenced topical report. Questions related to this subject should be directed to Robert Latta of my staff at (301) 504-1023.

Gary G. Zech, Chief
Performance and Quality Evaluation
Division of Reactor Inspection
and Licensee Performance
Office of Nuclear Reactor Regulation

cc: M. Fondeviole, FRAMATOME

TOPICAL REPORT

FRA - QP/85 0782 NP - Revision 6A

FRAMATOME QUALITY ASSURANCE PROGRAM

(FOR UNITED STATES APPLICATIONS)

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

July 14, 1992

Docket No. 99900041

Mr. Robert Voin
Vice President Quality
FRAMATOME
Tour Fiat
CEDEX 16 - 92084
La Defense
Paris, France

Dear Mr. Voin:

SUBJECT: NRC ACCEPTANCE OF REVISION TO FRAMATOME Q\ TOPICAL REPORT

We have completed our review of the proposed Revision 5 to the Framatome quality assurance topical report, QP/85 0782 NP, "Framatome Quality Assurance Program (For United States Applications)," as submitted with your letter dated February 17, 1992. Your submittal was clarified by letters dated May 20, 1992, and June 30, 1992, as well as several telephone conversations with Regine Perrin of your staff. Revision 5 documents recent organizational changes made to address Framatome's revised scope of activities.

We find that Revision 5, as clarified, meets the requirements of Appendix B to 10 CFR Part 50 and is, therefore, acceptable.

Please replace our previous acceptance letter with a copy of this letter, identify the report as Revision 5A of QP/85 0782 NP, and forward a copy to the NRC in accordance with 10 CFR 50.4. Please keep us informed, at the same address, of the nuclear units to which this QA topical report applies. Any questions on this subject should be addressed to the NRC staff reviewer, Stewart Magruder, on (301) 504-1023.

Sincerely,

Gary G. Zech, Chief
Performance and Quality Evaluation Branch
Division of Licensee Performance
and Quality Evaluation
Office of Nuclear Reactor Regulation

cc: R. Perrin, FRAMATOME

ABSTRACT

This Topical Report, submitted by FRAMATOME S.A., Paris, France, describes that Company's Quality Assurance Program as it will be applied to nuclear products and services provided in the United States. The report, which is similar in scope and content to equivalent reports by U.S. NSSS vendors, includes a discussion of the FRAMATOME QA program organization, a point-by-point discussion of compliance with the 18 criteria of 10 CFR Part 50, Appendix B, and a comparison of the program with applicable Regulatory Guides. There are no significant exceptions or deviations from NRC regulations or associated guidance.

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TOPICAL REPORT

FRAMATOME QUALITY ASSURANCE PROGRAM

(FOR UNITED STATES APPLICATIONS)

FOREWORD

This Topical Report describes the Quality Assurance Program of FRAMATOME applicable to design, procurement, fabrication, modification and maintenance activities affecting the quality of all safety-related products and associated services* provided directly by FRAMATOME to users in the United States. Products are identified as "safety-related" either by the customers or by FRAMATOME in accordance with internal instructions based on provision of ANSI N18.2 as defined in table 1. The program described in this Topical Report will be implemented by FRAMATOME for these products and services and it will be the policy of FRAMATOME to comply with the requirements of 10 CFR 50, Appendix B when supplying such products or associated services. The purpose of this Topical Report is to establish that FRAMATOME has a quality assurance program capable of producing and delivering products and services which comply with U.S. regulations, as such products and services are required by U.S. customers.

All orders for safety-related products and services will be processed through the FRAMATOME order entry channels. Items supplied by any FRAMATOME anizational element will be controlled through the procurement control systems described in this Topical Report. These procurement control systems provide mechanisms to impose appropriate quality requirements upon the supplying organization(s).

Changes to the commitments contained in this Topical Report will be submitted to the NRC for approval. Changes that may reduce the commitments contained herein will be submitted for approval prior to implementation, other changes will be submitted for approval within 90 days of the change.

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* *"Although FRAMATOME may or may not apply the same QA program for individual non-U.S. products or services, all safety related products and associated services for U.S. application will be separately identified, manufactured or performed, and be quality assured by personnel trained in U.S. requirements.*

QA records required by Regulatory Guide 1.28 Revision 3 will be established and any records the NRC needs to have available in English will be so provided".

In this Topical Report FRAMATOME stands for any FRAMATOME Operations* providing safety-related products and associated services to users in the United States and placed under the jurisdiction of FRAMATOME Nuclear Operations.

1. ORGANIZATION

FRAMATOME is responsible for the establishment and execution of the quality assurance program. When the work of establishing and executing any part of this quality assurance program is delegated to suppliers, FRAMATOME retains responsibility for overall program effectiveness.

The authority and responsibility of each organizational element shown in Figures 1, 2, and 3 are established by the President of FRAMATOME.

The Policy of FRAMATOME is to supply products and services having the quality to meet the required safety and reliability requirements. In particular, these products and services must meet all applicable rules, codes and standards. As FRAMATOME's scope of activities includes both nuclear and non nuclear businesses, the organization is tailored to take into account such diversity. FRAMATOME Corporation consists on one hand of corporate organizations, among which, Corporate Quality and Corporate Personnel and, on the other hand, of four operational organizations responsible each for a specific scope of activities.

Their responsibilities are assigned by the President of FRAMATOME and specifically include the responsibility for defining and achieving a Quality Policy consistent with the FRAMATOME Corporate General Policy and tailored to the scope of their activities. These operational organizations are :

- Nuclear Operations which is assigned the overall responsibility for the FRAMATOME Quality Policy concerning all the nuclear businesses,

- Mechanical Engineering which includes the Chalon Plant responsible for manufacturing large nuclear components such as reactor vessels, steam generators, pressurizer,... FRAMATOME Chalon Plant is a N and NPT ASME certificate holder.

- Two operational organizations in charge respectively of data processing and of connectors activities.

** "Operations" as used in this report stands for any FRAMATOME organization which may provide safety-related products and associated services to users in the United States : i.e. within Nuclear Operations : Nuclear Services, Fuel Division, Nuclear Engineering - and outside Nuclear Operations, the Chalon Plant.*

- The Nuclear Operations Executive Vice President is responsible that QA programs meeting the requirements of this Topical Report be established and implemented for any operational Unit involved in providing safety-related products and associated services to users in the United States.

- Nuclear Operations consist of four operational units and of a Quality Division. Reporting to the Nuclear Operations Executive Vice President, this Quality Division is charged by the Executive Vice President for enforcing the policy and the Quality Assurance programs covering nuclear activities of FRAMATOME, verifying the proper implementation of the necessary programs and reporting the results of its activities directly to him. However the Chalon Plant reports to the Mechanical Engineering, Nuclear Operations has been granted by the Corporate President the authority to survey their Quality Assurance program and policy as far as nuclear businesses are involved, this task is assigned to the Quality Division.

  Survey by Quality Division includes the following :

  . evaluation of Chalon Plant QA Manual for consistency with Nuclear Quality Policy and with this Topical Report,
  . audit of Chalon Plant Auditing Organization,
  . surveillance of Chalon Plant activities in accordance with provisions delineated for supplier surveillance in this Topical Report (more specifically section 7),
  . review of non-conformance disposition when the non-conformance involved a requirement of Equipment or Design Specification issued by Nuclear Operations,
  . review of procedure for auditors and examination personnel qualification.

- The Fuel Division reporting to Nuclear Operations is responsible for carrying out all activities concerning fuel-related orders. Fuel-related orders encompass contracts for supplying fuel, core components assemblies* and associated services. Taking into account the specificity of Fuel Division activities, a Quality Function has been created within this Division. On behalf of the Quality Division, this Function is responsible for establishing and implementing the Fuel Division QA Program. The QA manual describing this program shall be approved by the Quality Division.

- In addition :

  . Quality Division audits once a year Fuel Division Quality Function which acts as the Fuel Division auditing organization,
  . Internal Procedures issued by Fuel Division for detailing the QA Manual shall be reviewed for concurrence by Quality Division,
  . Quality Division on behalf of the Nuclear Operations Executive Vice President organizes and manages the annual management assessment of Fuel Division.

For other orders, the Operations in charge (Nuclear Island and Engineering, Nuclear Services, Chalon Plant) will be responsible for the overall order performance and, through the Project Manager, for control of technical interfaces between the customer and FRAMATOME suppliers.

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* *Core component assemblies: this term designates plugging device assemblies, burnable poison rod assemblies, rod cluster control assemblies, and primary and secondary source assemblies.*

Chalon Plant, which reports to Mechanical Engineering, is also responsible for manufacturing components ordered by another FRAMATOME Operations, which controls them through the procurement control system. When the Chalon Plant receives an order from the Operations involved, a Manufacturing Project Manager is assigned within the facility for assuring an interface between the facility and its customer, i.e. FRAMATOME.

Fuel Division is responsible for carrying out all activities concerning fuel-related orders, including coordination of calls for bids and contracts through its commercial organization, design, procurement, surveillance, testing and maintenance of fuel, core component assemblies and associated services. For management of fuel related orders, the Fuel Division assigns a Project Manager who is responsible for the interface between FRAMATOME and its customers.

The Nuclear Operations Executive Vice President, and the Manager Chalon Plant are responsible for establishing and implementing a quality assurance program that meets the requirements of this Topical Report.

Having jurisdiction for quality matters over all FRAMATOME nuclear businesses, the Quality Division is responsible for assuring the quality of products and services supplied to U.S. customers.

The Quality Division is functionally involved in the implementation of all FRAMATOME Quality Assurance programs. The Quality Division is responsible for :

1) Establishing the QA programs of Nuclear Operations.

2) Defining the requirements to be met by suppliers' quality assurance programs.

3) QA training programs.

4) Preparation of bids for analyzing and defining QA requirements.

5) Processing and managing all non-conformance reports and for determining required corrective actions.

6) Reviewing equipment specifications, technical procurement documents and purchase orders. Comments must be taken into account prior to issuance of the document for use.

7) Preparing, organizing and performing the surveillance of suppliers activities during manufacturing. This includes taking part in the kick off and expediting meetings.

   Indicating hold and witness points in Quality Plans which form the basis for surveillance of suppliers.

9) Reviewing on a random basis the documents issued by the Nuclear Engineering and Nuclear Services.

10) Surveillance of FRAMATOME and suppliers' activities performed at nuclear power plant sites.

11) Taking part in the preparation of documents to be used for FRAMATOME activities at nuclear power plants and in the qualification of processes, tooling and personnel for these activities.

In order to meet all these responsibilities, QA personnel are involved on a day-to-day basis in all safety-related activities. The basic criterion that flows from the policy statement and dictates the size of the Quality Units*, the major QA arm within FRAMATOME, is the following :

- The Quality Unit shall be provided with the personnel and other resources needed to assure that FRAMATOME products and services will meet the quality levels set forth in this Management Policy Statement.

In addition, each organization within FRAMATOME that provides a product or service shall provide sufficient quality control personnel to monitor the development process so that the requisite quality levels are achieved.

The numbers of Quality Assurance personnel within the Quality Unit, and of Quality Control personnel within other organizations shall not only provide the assurance of quality of the end product or service, but shall do so within established schedules.

Within each Operations, responsibility for establishing the QA program is assigned to a Quality Manager who is sufficiently free from direct pressures for cost and schedule and has the authority to stop unsatisfactory work or otherwise control further processing, delivery or installation of non-conforming materials.

The Quality Manager has access, as necessary, to higher management levels to assure the ability to identify quality problems, to initiate, recommend or provide solutions through designated channels, and to verify implementation of solutions.

This QA management position has the following characteristics :

a) It has direct access to the highest level Manager in the organizational element or facility involved on all quality related issues.

b) It has effective communication channels with other senior management positions.

c) It has responsibility for approval of Quality Assurance Manual(s).

d) It has no other responsibilities unrelated to quality assurance that would divert the Quality Manager's attention from quality assurance matters.

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* *In this report, Quality Unit designates :*

- *the Quality Division for Nuclear Operations (outside Fuel Division activities),*
- *either Quality Division or Fuel Division Quality Function acting on behalf of Quality Division for Fuel Division activities,*
- *Chalon Plant Quality Department for Chalon Plant.*

The minimum qualification requirements for the Quality Manager* are :

a) Graduation equivalent to bachelor's degree in a technical field.

b) At least ten (10) years experience in engineering or manufacturing with at least one of these years in a quality assurance organization.

c) At least five (5) years management experience through assignment in responsible positions commensurate with this position.

d) Knowledge of applicable quality-related codes, standards, and regulatory and statutory requirements.

e) Demonstrated ability to prescribe, apply, and assess compliance with applicable requirements.

Figures 1, 2 and 3 provide the general organizational commitments of FRAMATOME for the supply of safety-related products and associated services. FRAMATOME will keep the NRC informed of changes that impact these organizational commitments.

Functional organizations within FRAMATOME are also responsible for performing activities that assure the quality of safety-related products and associated services.

Functional organizations typically have responsibilities as follows :

a) Engineering groups are responsible for performing the various technical functions associated with the design and specification of safety-related products and associated services and for technical follow-up of the remainder of the design cycle at item suppliers.

b) Engineering groups are also responsible for providing applicable safety analyses. The control of design interfaces among the various engineering groups is described in Section 3.

c) Manufacturing groups are responsible for the manufacture, modification, testing and/or servicing of safety-related products and associated services. This responsibility includes material control, generation and control of manufacturing data, product planning and control, manufacturing functions, process qualification, and control and qualification of personnel.

d) QA groups are responsible for performing verification of implementation of the QA program and reporting the degree of compliance to management in order to provide necessary information to assure that the QA program is established and effective.

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* *The Quality Manager referred to in this report are :*

- *Chalon Plant Quality Department Manager,*
- *Quality Division Manager and his designee for Fuel Division the Quality Function Manager.*

e) QA activities in each area (those covered by the Engineering, Fuel, Chalon Plant or Nuclear Services QA Manual) include review of documents, service surveillance, audit of suppliers, performance of inspections and examinations, recording of results, preparation of documentation associated with the release of products, schedule of and participation in internal audits, and the development and maintenance of specific QA program documents.

Provisions for resolution of disputes involving quality, arising from a difference of opinion between QA personnel and personnel from other departments have been established within FRAMATOME. Essentially, the provisions do not permit a position set forth by a Quality Assurance representative to be overridden unilaterally by any other department. If the QA representative cannot be convinced that his or her position should be changed by arguments advanced by the involved personnel, these personnel can either accept the position taken by the QA representative or elevate the dispute to the next level of management. This elevation process is continued until resolution is obtained.

The Quality Assurance personnel have stop work authority and work cannot resume without their concurrence.

FRAMATOME activities at power plant sites in the U.S. will consist of maintenance-related activities, including plant modifications.

The FRAMATOME personnel assigned to perform a contractual tasks at a U.S. site will be formed into a Site Action Team.

The Site Action Team shall include :

- A Site Manager,

- Technical teams, headed by a shift supervisor, performing work according to applicable instructions,

- An inspection group, reporting to the Site Manager, in charge of the performance of quality control inspections, documentation of acceptable completion of follow-up requirements, and preparation of inspection reports. The number of quality control inspection personnel on a Site Team is tailored to the planned inspection plan and the number of shifts. Inspection personnel have the authority to stop work. Inspection personnel are qualified in accordance with the provisions of Regulatory Guide 1.28 rev.3 (See FRAMATOME position as discussed in Table 1).

The quality assurance surveillance of on-site activities is performed by surveillance personnel assigned to the site activity by the Quality Unit.

The Site Manager is responsible for :

- Site preparation,
- Coordination of operations performed on site,
- Compliance with the activities scheduling,
- Compliance with specified quality control requirements,
- Procurement on site, when authorized,
- Ensuring that all personnel working on site are duly qualified and fit for duty.

All FRAMATOME personnel on site report to the Site Manager except for quality assurance personnel from the Quality Unit.

Quality assurance personnel from the Quality Unit will accompany each Site Action Team. The lead individual is called the Quality Site Leader. All Quality Assurance personnel on-site report to the Quality Site Leader and he or she reports to his or her immediate supervisor in the Quality Unit.

The Quality Site Leader has no non-QA duties and is provided with approved procedures for on-site Quality Assurance activities.

2. QUALITY ASSURANCE PROGRAM

The program described herein is applied to all activities affecting safety-related products and associated services. For subcontracted products and services, this QA program provides measures for identifying the QA requirements to be imposed on the suppliers. Classification of products and services are made by the cognizant Technical organizations with monitoring by the quality organization. The classification is based upon the product's importance to safety in accordance with applicable codes and standards.

This Topical Report describes the commitments of FRAMATOME to all quality assurance related Regulatory Guides with those variations as shown in Table 1.

Outside of fuel related activities, the Quality Division is responsible for reviewing all non-conformance reports in order to determine those which may need to be reported to the NRC. In such a case, the Quality Division will promptly (within 48 hours) notify the 10 CFR 21 Evaluation Committee created within the Company for evaluating potential reportable 10 CFR 21 situations. This Committee is responsible for determining whether or not the situation involves a potential or real defect and proposing to the Quality Division Manager a notification to involved parties and, if required, to the NRC.

For fuel related activities, the Fuel Division General Manager is responsible for assuring that potentially reportable 10 CFR 21 situations are promptly (within 48 hours) notified to the 10 CFR 21 Evaluation Committee.

For potential defects or deviations not covered by or detected through the "non-conformance process procedure", the notification procedure specifies how these situations are reported to and processed by the 10 CFTR 21 Evaluation Committee.

The procedures also provide for notifying FRAMATOME Suppliers that they shall comply with the requirements of 10 CFR 21, as specified in the purchase order.

The notification procedure provides for prompt action by all parties involved, the maintenance of auditable records, weekly status reports, in part, to avoid unreasonable evaluation periods, and requirement for informing the NRC within 48 hours after the Quality Division Manager decision, unless he or she has actual knowledge that the NRC has already been adequately informed of the situation.

FRAMATOME Operations in charge of the contract are responsible for compliance with the requirements of 10 CFR 50.55a. As applicable, ASME Code requirements are supplemented with the guidance of the Regulatory Guides as per Table 1. FRAMATOME also is committed to compliance with 10 CFR 50.55(e) by reporting, as necessary, to NRC Licensees to which it either has provided or is providing products or services.

FRAMATOME organizations involved in supplying safety-related products and associated services for U.S. customers have QA programs described in QA Manuals and working procedures which describe the provisions made for meeting the commitments of this Topical Report, and provide for special equipment, environmental conditions and processes as necessary. Table 2 contains the list of these Manuals.

These programs and procedures are documented and controlled as described in Section 6. They are reviewed by the QA organization and are made mandatory by the Nuclear Operations Executive Vice President.

FRAMATOME Nuclear Operations management is responsible for the review of the status and adequacy of the QA programs within all Operations, and for compliance with the commitments of this Topical Report and the requirements of 10 CFR 50, Appendix B. An annual assessment plan is established by this Management which defines the assessments to be performed, the planned schedule and the members of the assigned team. Reports are distributed to the Nuclear Operations Executive Vice President.

For assessing implementation of the QA program, the Nuclear Operations Management has an annual assessment performed in order to verify that the programs are effectively implemented and appropriate. A team consisting of two or more members selected among senior officers is designated by the Nuclear Operations Executive Vice President for each assessment, the selected members have no responsibility in the area to be assessed.

For Chalon Plant, the General Manager is responsible for performing the management assessment according to the provisions of the ASME QA Manual (N. Certificate holder).

An assessment plan is prepared and used by the team for this assessment and the results of the assessment are documented in a report which is distributed to the Vice President and the Managers of the areas subject to the assessment. These reports identify the needs for corrective actions and follow-up is assured by the team help as necessary by the Quality Division. Required corrective actions are identified and follow-up is assured until close out.

Provisions are established to assure that personnel performing activities affecting quality have appropriate qualifications for their functions. These provisions assure that :

- These personnel have achieved and maintain required qualification in the fundamentals and techniques related to their activities,

- These personnel are specifically trained and indoctrinated on the purpose, scope, and contents of the Quality Assurance Manual covering their activities. The provisions also provide for definition of qualification criteria for specific activities such as inspection, special processes, surveillance, and auditing. When formal training and qualification are required by Regulatory, Codes or Standards requirements, the provisions define the documentation required to give evidence of the training performed (content of program, objectives, date, attendance list) and the proficiency tests to be given. Conditions for qualification and/or certification renewal are specified. Certificates of Qualification specify the function that the person is qualified to perform, the criteria used for qualification, and the qualification validity period.

Personnel performing inspection, testing, examination and audit activities are qualified and the qualification is documented. Personnel qualification includes documentation of capability either through the use of formal written tests or through physical demonstration of skills. Qualification requirements include specific provisions for education and/or experience.

All personnel performing and verifying quality affecting activities are trained. This training includes indoctrination to the requirements of the applicable QA programs and provides for training required for the performance of special activities. This training is documented.

3. DESIGN CONTROL

FRAMATOME has established measures to correctly translate applicable Regulatory requirements and design bases into design, procurement and procedural documents. This design control program is applied to design activities for safety-related products and associated services. The design control program includes field design engineering, physics, seismic, stress, thermal, hydraulic, radiation and the SAR accident analyses, associated computer programs, compatibility of materials, accessibility for inservice inspection, maintenance, repair, and quality standards. All design documents include appropriate quality standards. Design documents subject to the design control program include design input and criteria, design analyses, specifications, calculations, computer programs, system descriptions, SARs when used as design documents, and drawings including flow diagrams, piping and instrument diagrams, electrical single line

diagrams, control logic diagrams, structural systems for major facilities, site arrangements, and equipment locations.

As described in Section 1, engineering groups within Operations, are responsible for the preparation, review, approval and verification of design documentation. Identified errors in approved design documents are documented and corrected.

Design interface controls are established in procedures, instructions and formal agreements. These controls include a description of the responsibilities of the affected parties for the review, approval, release, distribution, and revision of design documents that involve multiple design organizations, including the user or its agent. The control measures are designated in order to ensure that components are compatible geometrically, functionally, and with processes and the environment.

Technical drawings and specifications are used to specify technical and quality requirements for equipment. They are reviewed by the assigned reviewer of the design organizations to verify their accuracy and completeness. Equipment specifications and design procurement documents are reviewed by representatives from the quality organization to assure that they include proper quality, inspection, test and documentation requirements.

Within Nuclear Engineering and Nuclear Services, a selection at random from all design documents including drawings is made and selected documents are reviewed by a quality reviewer from the Quality Division. This review covers both the technical content and compliance with requirements for design document preparation. Assignment to the position of quality reviewer is made by the Quality Division Manager on the basis of :

- Education level,

- Experience, including design experience.

Within Fuel Division, any new design must be reviewed one or more times by the Formal Design Review Committee. A representative of the Quality Function is a member of this committee.

Design verification is performed using one or more of the following verification methods: design review, alternate calculation and/or qualification testing. The design verification method is selected based on the complexity of the design and on the type of design document. It is performed by individuals or groups other than those who performed the original design. When the designer's supervisor is the only available technically qualified person, the supervisor will perform the design verification. In those cases, the justification is documented and approved in advance by the supervisor's management. Only documents having obtained all required reviews and approvals, including design verifications can be used for manufacturing, modification or design.

Qualification tests may be used to verify portions of a design together with other verification methods. They are performed under conditions that simulate the most adverse design conditions.

Procedures identify the verifications required according to the document involved (by a single individual or by interdisciplinary or multi-organization teams). These procedures identify the verifier(s)' responsibilities, areas, and pertinent considerations to be verified, and the required documentation.

Computer codes used in design are verified and their use is controlled. Procedures prescribe requirements for computer code development, verification, determination of applicability to the problem, certification for use, configuration control, and documentation.

Written procedures control design changes, including field changes and identified design deficiencies. The design change controls assure that the level of control and organizational involvement is commensurate with that for the original design.

4. PROCUREMENT DOCUMENT CONTROL

All requirements applicable to the procurement of safety-related products and associated services are specified in procurement documents. Such requirements include the Regulatory requirements (including, for example, 10 CFR 21), requirements of industrial Codes and Standards, inspection and test requirements, requirements related to special processes and instructions, and, in addition, supplier QA program requirements, requirements for access to the supplier's facility, requirements for documentation, and requirements for non-conformance control. General, technical and/or quality requirements are specified by reference to technical specifications and/or other documents. Procurement documents are controlled as described in Sections 3, 5 and 6. Procurement documents are developed based on input from requisitioners and are reviewed and approved by the involved engineering and quality assurance groups. This includes review to assure that quality requirements are correctly specified, including adequate acceptance and rejection criteria, and that the procurement documents have been prepared, reviewed and approved in accordance with quality assurance procedures. Spare or replacement part procurement is subject to the present QA program control and to Codes, Standards and other technical requirements equal to or better than the original technical requirements, or as required to preclude repetition of defects.

Procurement is from approved suppliers. Suppliers are approved as described in Section 7.

5. INSTRUCTIONS, PROCEDURES, AND DRAWINGS

Activities affecting quality of safety-related products and associated services are performed in accordance with documented instructions, procedures or drawings which include appropriate quantitative and qualitative means of verifying quality. Required actions and responsibilities for preparation, review, approval and control of these documents are established in procedures or instructions.

6. DOCUMENT CONTROL

Measures for the review, approval and issuance of documents covering safety-related products and associated services and changes thereto are established internally to assure technical adequacy and inclusion of appropriate quality requirements prior to implementation. These measures include responsibilities for required independent reviews by qualified individuals for quality provisions. Quality Unit personnel review and concur with QA-related aspects of documents to assure acceptability. In addition, these procedures provide a means to assure that :

a) The proper document revisions are used.

b) Obsolete or superseded documents are controlled to prevent inadvertent use.

c) Controls are performed for document changes.

d) Individuals or groups responsible for reviewing, approving, and issuing documents and revisions thereto are identified.

e) Review and approval of changes are performed by organizations which originally reviewed/approved the document or by a designated alternate organization.

f) Approved changes are included in instructions, procedures, drawings, and other documents prior to implementation of the change.

g) Documents are available at the location where the activity will be performed prior to commencing the work.

Document control activities also include provisions for the use and availability of master lists and/or tables of contents to identify the current revisions of documents. Within the scope of each Quality Assurance Manual an organization is designated as the Document Control Organization responsible to assure updating of master lists, by a real time computerized system for the Engineering Divisions within Nuclear Engineering and Chalon Plant and by use of a controlled distribution system for the other organizations.

For controlled documents, i.e. those documents with a controlled distribution list, copies of revisions are sent to all addressees by a standard form which instructs the recipient as to the disposal of the previous edition.

Predetermined personnel will receive revisions of documents upon their issuance. Personnel who are not sure about a document's status or revision number can check the current computer file.

Document control is applied to design, procurement and non-conformance documents including as-built documents and documents related to computer codes, as well as to instructions and procedures. Topical Reports and other required Regulatory documents are controlled as described in this section.

In some cases FRAMATOME's activities may modify certain aspects of the plant. The customer is informed of any planned changes prior to the on-site work. Upon completion of the work, the licensee is provided with a report and any related drawings and specifications to clearly define the impact of the work on the actual plant, such that as-built documentation can be prepared.

7. CONTROL OF PURCHASED MATERIAL, EQUIPMENT, AND SERVICES

When specified in its procurement documents (see Section 4), FRAMATOME provides for QA surveillance of suppliers during fabrication, inspection, testing and release of safety-related products and associated services.

For complex items, established quality standards provide planned guidance for surveillance activities. Where no pre-established quality standards exist for a specific supplier, the specific technical requirements of the procurement documents are used as the basis for surveillance. The degree of surveillance varies with the degree of importance of equipment, supplier performance and complexity of items. The degree of surveillance is determined by the design organization which issued the equipment specification and by the QA organization in charge of surveillance of the supplier operation in the shop or on site. This surveillance is performed using written instructions which define the operation or process to be witnessed and the verifications to be made.

For commercial "off the shelf" items to be used for safety-related products and associated services but where specific QA control appropriate for nuclear operation cannot be imposed in a practical manner, a receiving inspection is performed using written instructions which identify the inspections and/or tests to be performed and the acceptance criteria. These instructions are subject to the document control provisions.

Prior to placing an order with a new supplier, a survey or evaluation is conducted by quality assurance engineers and, as appropriate, engineering and/or purchasing. The results of these surveys or evaluations, including identified deficiencies, are documented and reported to management. These surveys or evaluations verify that the supplier is capable of complying with the quality requirements of the procurement documents. Deficiencies are resolved with the supplier prior to start of fabrication. Periodically, suppliers are reaudited to verify continued acceptable compliance with procurement document requirements.

In some cases a FRAMATOME organization may procure a product or service from another FRAMATOME organization. Evaluation of these FRAMATOME organizations is mainly based on an evaluation of their QA Program performed by the procuring organization. The basis for evaluation include results of both surveillance and management assessment.

For items shipped to a FRAMATOME manufacturing facility, receiving and/or source inspection is performed to verify that the item and specified documentation comply with the procurement requirements. The status is identified on or traceable to the item.

For items procured by FRAMATOME (from an outside supplier or another FRAMATOME organization) and shipped to a nuclear power plant site, QA personnel issue a Quality Release, which indicates FRAMATOME acceptance of both the item and the associated documentation. The quality release is a document which includes specific information identifying the item and the applicable procurement documents, and which certifies that the item meets all procurement requirements, including documentation requirements. The quality release includes identification of any approved deviations from the procurement requirements and is signed by an authorized person.

The Quality Release is granted only when the supplier has made available the following required records to FRAMATOME :

1. Documentation that identifies the purchased item and the specific procurement requirements met by that item.

2. Documentation identifying any procurement requirements that have not been met.

3. Description of those non-conformances from the procurement requirements dispositioned "accept as is" or "repair".

Procedures identify the actions necessary to initiate, authorize, issue, distribute and revise quality releases. These procedures include provisions for review and acceptance of supplier furnished documentation (e.g. Certificates of Conformances, Certified Material Test Reports, Non-Destructive Examination Reports) and for identifying and following-up contingent conditions that require additional action after delivery to the power plant site. A contingent condition is any condition prohibiting the actual use of material or equipment on-site for its specified purpose. An example is an item for which a non-conformance is nearing resolution but for which final resolution, while not in serious doubt, will require additional time. Another example is a piece of equipment that lacks a part that restricts the range of use of the item. Such items may be shipped on-site to permit partial testing or preparation for use to proceed, but actual use as intended will be prohibited until the contingent condition is resolved. Contingent conditions are monitored and their closing-out is documented.

QA personnel are responsible for assuring that the specified inspection, test and other records are available at the nuclear power plant site prior to an item being installed or used.

The measures established for product acceptance and supplier auditing provide for periodic evaluation of the supplier's certificates of conformance to ensure that they are valid and the results documented.

Measures are established to assure that items accepted and released are identified as to their inspection status in order to prevent the use or installation of non-accepted item. These measures provide for the entry of only accepted items into the warehouses.

8. IDENTIFICATION AND CONTROL OF MATERIALS, PARTS, AND COMPONENTS

Identification requirements are established in QA programs and are specified in the procurement documents for safety-related products and associated services.

These requirements take into consideration the location and the method of identification so that the fit, function, or quality of the item being identified is not adversely affected. Identification and control of items (including consumables) is the responsibility of the organization responsible for the item's quality (i.e. the supplier or a FRAMATOME Division) and the Quality Unit performs surveillance of the responsible organization.

Identification and control procedures assure that identification is maintained on the item or on records traceable to the item to preclude use of incorrect or defective items. Identification of items can be traced to appropriate documentation such as design documents, procurement documents and/or inspection records. Identification of items is verified and documented prior to release of the item for further use.

9. CONTROL OF SPECIAL PROCESSES

FRAMATOME has established procedures to maintain control over special processes for safety-related products and associated services. The processes that are controlled as special processes are the following :

- the processes where direct inspection is impossible or disadvantageous,

- the processes, the results of which are highly dependent on the control of the processor or skill of the operator or both.

This control includes the qualification of processes and personnel for welding and inspection in accordance with ASME or RCC-M* requirements as applicable, non-destructive examination per SNT-TC-1A or per COFREND, and other processes which may be necessary for adequate control. Qualification records are maintained, and periodically personnel qualification records are reviewed for currency. The periodic reviews assure that personnel performing special processes have valid qualifications.

** RCC-M is the French construction code equivalent to ASME III code. Its title is "design and construction rules for mechanical components of PWR Nuclear Islands".*

Special processes, such as welding, casting, heat treating, non-destructive examination, electro-mechanical machining, explosive forming, cleaning, painting, and other processes which meet the definition specified above, are prescribed by means of documented procedures. The special process procedures and certificates of qualified personnel are maintained under document control and record keeping systems. The quality organization having authority over the organizational element responsible for developing and implementing a special process performs surveillance of the qualification activities to assure that proper instructions are prepared and used and that qualification records providing evidence of satisfactory performance are established. Special processes are performed by qualified personnel and accomplished in accordance with prescribed procedural controls. Recorded evidence of verification is maintained.

Computer code programs developed for manufacturing purposes (for example, computer control of coordinate measuring machines, computer integrated manufacturing operations) are considered as special processes and are subject to control procedures which prescribe requirements for development, verification, determination of scope, and use.

10. INSPECTION

FRAMATOME has established procedures that control fabrication activities of safety-related products and associated services. These procedures provide control of the selection and identification of required inspections in a Quality Plan identifying the inspections to be performed, their location in the manufacturing process and the mandatory hold points required by various organizations (such as the Quality Department, Authorized Nuclear Inspector, or Customer). This document is either prepared and/or approved by the Quality organization having authority in the Division responsible for the item to be inspected. Inspections for product acceptance are performed by personnel who are not responsible for the work being inspected. Inspection personnel are qualified. Their qualification is certified as described in Section 2. When the individuals performing product acceptance inspection are not part of the QA organization, the inspection procedures, personnel qualification criteria and independence from cost and schedule pressure are reviewed and found acceptable by the QA organization prior to the initiation of the activity.

Inspection procedures, instructions, and/or checklists and identified drawings and specifications include identification of characteristics and activities to be inspected, identification of the organizations (or individuals) responsible for the performance of the inspection, acceptance and rejection criteria, description of inspection methods, including special inspection equipment and accuracy requirements, and recording the inspector or the data recorder and the results of the inspection operation. The organization (or individual) performing the inspection is responsible for evaluating the results obtained and recorded, and for determining the acceptability of the inspected item. Periodic audits are conducted by the quality organization to confirm that these responsibilities are properly performed.

11. TEST CONTROL

FRAMATOME has established measures to control testing of safety-related products and associated services. These measures include identification of required testing, development of procedures, a means of assessing the adequacy of tested items, and designation of responsibility for performing the various phases of testing activities. Tests required during manufacturing are identified in the Quality Plan of the involved item. The measures established for the control of special processes include provision for identifying the necessary qualification tests.

Test procedures and/or associated instructions include :

a) Methods and instructions for performing the test.

b) Identification and accuracy of test equipment to be used.

c) Test prerequisites, such as calibrated instrumentation; adequate and appropriate equipment; trained, qualified, and licensed and/or certified personnel; preparation, condition, and completeness of the item to be tested; and suitable and, if required, controlled environmental conditions.

d) Requirements and acceptance/rejection limits, by incorporation or reference.

e) Mandatory inspection hold points for witness by owner, contractor, or inspector,

f) Requirements for documenting test data and results.

These procedures and/or associated instructions may be provided in various controlled forms, such as test procedures, test specifications, drawings, process routing sheets, and test instructions. The Quality Organization must ensure that all test prerequisites have been met prior to testing and that this verification is properly documented.

Test results are documented, evaluated, and their acceptability determined by a qualified, responsible individual or group. Modifications, repairs, and replacements are tested in accordance with the original test requirements or appropriate alternatives.

12. CONTROL OF MEASURING AND TEST EQUIPMENT

FRAMATOME maintains means of controlling measuring and test equipment used on safety-related product and associated services. The Chalon Plant, Nuclear Services, and Fuel Division have developed their own programs considering such attributes as inherent stability, purpose of use, desired accuracy, and degree of usage. Measuring and test equipment used for the acceptance and verification of quality of safety-related products and associated services is maintained under control systems which identify the status of all measuring and test items.

Typical of this equipment are micrometers, plug gages, hardness testers, etc. Documents detail the requirements for the calibration (including frequency and maintenance) of measuring and test equipment and the use of appropriately traceable measurement standards, and describe organizational responsibilities for establishing, implementing, and assuring effectiveness of the calibration program. Calibration procedures used shall make reference to National or International Standards when such standards exist. In case no National or International Standards exist, the calibration basis shall be documented in a procedure. When calibrating measuring and test equipment, typical transfer ratios of four to one are used. Exceptions may be necessary because of limitations in the state-of-the-art. Measuring and test equipment are identified and traceable to the calibration test data and for other required documentation. The complete status of all items under the calibration system, including personal acceptance gages, is recorded, maintained, and controlled. This calibration status is indicated on or traceable to the measuring and test equipment. The quality organization having authority over the organizational element which uses measuring and test equipment shall ensure by auditing and monitoring that the calibration program required by the QA Manual is correctly implemented and is effective.

Procedures assure accuracies within established standards and include disposition and/or corrective measures when discrepancies are noted. Damaged or inaccurate measuring and test equipment is removed from use until repaired, recalibrated or replaced. Measures are taken and documented to determine the validity of previous inspections performed when measuring and test equipment is found to be out of calibration.

13. HANDLING, STORAGE, AND SHIPPING

FRAMATOME has established procedures to control cleaning, packaging, shipping, storage, and handling activities for safety related products and associated services. Where required, these activities are accomplished by appropriately trained individuals.

These procedures include control of cleaning, handling, storage, packaging, shipping, and preservation of materials, components, and systems in accordance with design specification requirements to preclude unacceptable damage, loss, or deterioration by environmental conditions. The identified controls include considerations for identification of inspection, use, personnel training and qualification, auditing, non-conformances, and other appropriate requirements. These procedures may be in various formats, such as manufacturing procedures, shipping instructions, drawings, manufacturing routing sheets, cleaning process specifications, and procedural training booklets.

14. INSPECTION, TEST, AND OPERATING STATUS

FRAMATOME has established procedures to indicate inspection, test and operating status of safety-related products and associated services during fabrication, installation and testing. These procedures control the application and removal of status indicators through the use of inspection control cards, shop travelers or other documents. Those procedures also control sequence changes and the identification of non-conforming items (see Section 15.).

FRAMATOME has established procedures to document the sequence of required tests, inspections, and other safety-related operations. These documents are subject to the provisions of document control described in Section 6., which include the control of altered sequences.

15. NON-CONFORMING MATERIALS, PARTS, OR COMPONENTS

FRAMATOME has established procedures to control the identification, documentation, segregation, review and disposition of non-conforming safety-related products and associated services, including computer codes. They include notification to affected organizations if disposition is other than scrap. These procedures identify individuals or groups who are authorized to dispose of and approve non-conformances and describe the segregation and/or control of non-conforming items to prevent inadvertent use.

Documentation identifies the non-conforming items, describes the non-conformance, the disposition of the non-conformance, including re-inspection requirements, and includes documented approval of this disposition. When non-conforming items are repaired or otherwise made suitable for their designed use, they are inspected and tested in accordance with the original inspection and test requirements or acceptable alternatives.

Within each FRAMATOME Manufacturing facility, the quality organization of this facility is responsible to review and approve the decisions proposed by the facility engineering organization. When the non-conformance is against a requirement of FRAMATOME Operations (Nuclear Engineering or Nuclear Services), then the disposition proposed by the facility is submitted to the Operations concerned and is reviewed and approved by Quality Division.

When a non-conformance is reported by a FRAMATOME supplier or disclosed by an employee of FRAMATOME Operations, the final decision is made by the Quality Unit.

In either case, the Quality Unit is responsible for obtaining the necessary advice.

As manufacturing activities are subcontracted either to FRAMATOME Manufacturing facilities or to outside suppliers, in its purchase order, the Operations involved require the supplier to be responsible for identifying the required corrective actions. The Quality Unit performs analyses of non-conformance reports to identify if corrective actions are to be required from the supplier involved.

Within the FRAMATOME Manufacturing facilities, measures are established to assure that the Quality Department reviews the following documents on a continuous basis: Inspection (including non-destructive examination) Reports, Defect Notices, and Heat Treatment Reports in order to disclose any trends, undertake the necessary corrective actions and report quality trends and corrective actions to the Manufacturing facility Manager involved.

FRAMATOME suppliers are required to establish measures to assure that non-conformance reports are analyzed and quality trends identified and reported to the appropriate Management level.

16. CORRECTIVE ACTION

FRAMATOME has established procedures that provide for corrective actions for safety-related products and associated services. These procedures include the initiation and documentation of corrective actions to preclude recurrence of significant conditions adverse to quality. Implementation of corrective action is verified by responsible individuals or organizations, and verification is documented to close out the corrective actions. Corrective action processing involves participation of the quality organization responsible for the final decision either directly (within Nuclear Operations) or through a Corrective Action Committee chaired by the Quality Manager. These decisions are documented. In the case of corrective actions resulting from non-conformance reports and audit reports (or similar reports such as NRC inspection reports or customer audit reports) the quality assurance organization participates in verifying that appropriate corrective actions are implemented.

For significant conditions adverse to quality, the cause and corrective actions taken are documented and reported to management, including upper management, for review. Non-conformance reports are generated as described in Section 15. These non-conformance reports are reviewed to determine the need for corrective action and are analyzed for trends. The results of these trend analyzes are provided to upper management.

17. QUALITY ASSURANCE RECORDS

FRAMATOME has established procedures to provide for the generation, maintenance, retention and use of those quality assurance records for safety related products and associated services. The record procedures control those design, fabrication and inspection documents listed in Table 1 of Regulatory Guide 1.28 Revision 3. These records include results of reviews, inspections, tests, audits, and material analyzes; monitoring of work performance; qualification of personnel, procedures, and equipment; and other documentation such as drawings, specifications, procurement documents, calibration procedures and reports, non-conformance reports; and corrective action reports. These procedures are based on the requirements of the Quality Committee and of the Quality Unit and define the responsibility assignment for indexing,

distributing, identifying, classifying and retaining quality assurance records. Permanent and non-permanent storage of quality records is accomplished by assuring at least a single copy of record is stored at the FRAMATOME Records Centers placed under the responsibility of Corporate Personnel.

All QA records are microfilmed and retained in an underground FRAMATOME facility located near Tour Fiat. This facility meets the requirements of NQA-1-1983, Supplement 17S-1.

When required by contract, records are forwarded to the user for retention.

18. AUDITS

FRAMATOME has established procedures that provide a comprehensive system of quality assurance program audits of activities affecting the quality of safety related products and associated services. Audits are performed by qualified audit personnel using written procedures or checklists designed to provide an objective evaluation of the quality assurance program and its effective implementation. Within each organizational element, audits are planned and conducted by the quality organization responsible for its QA manual. Activities of the quality organizations themselves are audited by a team of qualified auditors, having no responsibilities in the area to be audited and selected from an other FRAMATOME Quality Organization. The Quality Organization to be audited shall not be involved in the team members selection. A written report that documents the audit results and required corrective actions is prepared by the team leader and distributed to the management of the organization being audited and to the quality organization having authority on the organizations being audited. The corrective actions to be proposed by the organization responsible for finding are reviewed by the quality organization or by the team leader (when the quality organization was the area audited). Verification of corrective action (including re-audit of deficient areas, where appropriate) is performed and documented.

Within each organization having a QA Manual conforming to the requirements of this Topical Report, the quality organization responsible for establishing and having this Manual implemented establishes an annual audit schedule to ensure that all the provisions of the Manual are audited at least once a year or once within the life of the activity, whichever is shorter. These audits ensure that procedures and activities comply with the overall QA program and provide a comprehensive independent verification and evaluation of quality-related procedures and activities. Furthermore, the Quality Division establishes an annual schedule for auditing the activities of all the quality organizations subject to the commitments of this Topical Report.

Audits beyond the annual program are performed when one or more of the following conditions exist :

- Significant changes are made in the Quality Assurance Program,

- Quality of an item or service may be jeopardized by a deficiency in the Quality Assurance Program or in its implementation,

- There is a need to verify that corrective actions, identified in a prior audit, have been properly implemented.

For vendor audit scheduling, see Section 7.

TABLE 1

FRAMATOME POSITIONS ON REGULATORY GUIDES AND INDUSTRY STANDARDS

+ +

Regulatory Guide 1.8, Rev. 1-R and ANSI N18.1-1971
Personnel Selection and Training

FRAMATOME follows the NRC Regulatory Position for personnel involved.

+ +

Regulatory Guide 1.26, Rev. 3
Quality Group Classifications and Standards for Water-Steam and Radioactive-Waste-Containing Components of Nuclear Power Plants

FRAMATOME performed an evaluation of the regulatory position defined in the Regulatory Guide and of the provisions of ANSI N18.2 - 1973 and its addendum ANSI N18.2-a - 1975. It was found that the ANSI provisions based on the safety functions and importance of equipment as regards safety are consistent with and meet the requirements of the Regulatory Guide which lists the equipment to be classified in each group and then defines the code to be used.

Both Regulatory Guide 1.26 and ANSI 18.2 - 1973 plus addendum N18.2-a - 1975, require implementation of the ASME Code.

As an alternative FRAMATOME follows the provisions of ANSI N18.2 - 1973 and addendum N18.2-a-1975 for the quality classification for nuclear power plant components. In addition for design conditions of fuel assemblies FRAMATOME follows the provisions of ANSI/ANS 57.5 - 1981 which complies with those of ANSI N18.2.1973.

+ +

<u>Regulatory Guide 1.28, Rev. 3 and ANSI/ASME NQA-1-1983 and ANSI/ASME NQA - 1a - 1983 Addenda Quality Assurance Program Requirements (Design and Construction)</u>

FRAMATOME follows the NRC Regulatory Position with the following clarifications, alternatives and exception.

REG. GUIDE/ANSI STD. PARAGRAPH	FRAMATOME POSITION
1. Supplement S-1 - Terms and Definitions. "Quality Assurance Record" (Section 1.4). A completed document that furnishes evidence of the quality of items and/or activities affecting quality.	Alternative A manufacturing document is considered a quality assurance record, and thus requires protection, at the time of product shipment. During the period from receipt or generation of the record until it is incorporated in the long-term protection system, these documents are afforded protection by normal office procedures, and duplicate copies of completed records (signed and issued for use) are maintained in different locations in the same building. Records lost during this period will be reconstructed.
2. Appendix 2 A-1 Qualifications of inspection and test personnel. Functional qualifications (Subsection 2.0).	Alternative Within FRAMATOME the specific level designations for personnel involved in inspection, examination, and testing activities may not be used. A combination of position descriptions and pre-determined qualification requirements for a position define the level of capability required to perform the function. These methods are used to identify levels of capability that include the comparable requirements of the levels identified in this standard. When such level designations are used, the responsibility assigned to

REG. GUIDE/ANSI STD. PARAGRAPH	FRAMATOME POSITION
	a level 1 inspector does not include evaluation of the validity and acceptability of inspection, examination and test results. The French education system is the reference base for evaluating the general education level required.
3. Supplement 2 S-2 Qualifications of non-destructive examination personnel. Applicable documents (Subsection 2.1).	Alternative For non-destructive examinations which are not covered by ASME code requirements, FRAMATOME personnel are qualified according to the French national system (COFREND), a description of which is provided in Appendix 1 to this Topical Report. The requirements used for the French qualification system are equivalent or exceed those recommended by the American Society of Non-Destructive Testing except for the validity period. Appendix 1 indicates the additional provisions made by FRAMATOME to meet the validity period used in the U.S.

REG. GUIDE/ANSI STD. PARAGRAPH	FRAMATOME POSITION
4. Supplement 3 S-1	
4.1 (Subsection 4.0).	Alternative
This verification may be performed by the originator's supervisor provided the supervisor did not specify a singular design approach or rule out certain design considerations and did not establish the design inputs used in the design or provided the supervisor is the only individual in the organization competent to perform the verification. Cursory supervisory reviews do not satisfy the intent of this Standard.	Within FRAMATOME, the designer's immediate supervisor may perform design verification in exceptional cases when the supervisor is the only qualified individual available. In each case when the designer's immediate supervisor performs the design verification, justification is documented and approved in advance by the supervisor's management. Additionally, the other provisions of this Regulatory Guide are satisfied, and during quality assurance audits, the frequency and effectiveness of the use of supervisors as design verifiers is reviewed to avoid abuse.
4.2 (Subsection 5.0) Change control.	Exception
Changes to final designs, including field changes shall be justified and subject to design control measures commensurate with those applied to the original design and approved by the same affected groups or organizations which reviewed and approved the original design documents.	When an editorial or commercial change is made in a design document, the change is approved by designated responsible authorized personnel. These types of changes do not require any additional review. However, revised approved documents are distributed to appropriate quality assurance personnel who verify that their review was not required.

REG. GUIDE/ANSI STD. PARAGRAPH	FRAMATOME POSITION
4.3 (Subsection 6.0) Interface control. Interface control shall include the assignment of responsibility and the establishment of procedures among participating design organizations for the review, approval, release, distribution, and revision of documents involving interfaces.	Clarification The titles, responsibilities and authority of persons involved in the design process are defined in FRAMATOME by organizations charts and internal procedures. These documents are available for audit but are not transmitted to external organizations. Various interface agreements are established among the FRAMATOME design departments and suppliers or customers to ensure the proper flow and control of design information among the participants, and are documented by corresponding procedures, memorandums of understanding or contract documents.
4.4 (Subsection 7.0) Documentation and records.	Clarification For design verification activities performed within FRAMATOME the signature of a responsible reviewer may be used to document and substantiate the performance of the verification activity when authorized by the quality assurance program.

REG. GUIDE/ANSI STD. PARAGRAPH	FRAMATOME POSITION
5. Supplement 4 S-1.	Clarification
5.1 (Subsection 2.2)	Technical requirements may be clarified or amended in a change notice "Notification with Acknowledgement of Receipt" and are not always specified "by reference" to other documents. This practice is used to specify unique or changing requirements which have not been routinely incorporated in the documents referenced in the purchase order.
Technical requirements shall be specified in the procurement documents. Where necessary, these requirements shall be specified by reference to specific drawings, specifications, codes, standards, instructions, including revisions thereto, that describe the items or services to be furnished.	
The procurement documents shall provide for identication of test, inspection, and acceptance requirements of the Purchaser for monitoring and evaluating the Supplier's performance.	Alternative FRAMATOME identifies notification points in supplier documents when applicable. Such points are not always identified in the procurement documents. However, the required notification / hold points are specified on the quality plan required from the supplier before authorizing to start manufacturing activities.
5.2 (Subsection 2.3) Quality Assurance Program Requirements.	Clarification Within FRAMATOME, standard hardware and catalog items and materials are procured to standard commercial terms and conditions. To assure that these items are of requisite quality, a certificate of compliance, source
Procurement documents shall require that the Supplier have a documented quality assurance program that implements portions or all of the requirements of	

REG. GUIDE/ANSI STD. PARAGRAPH	FRAMATOME POSITION
this Standard. The extent of the program required shall depend upon the type and use of the item or service being procured.	inspection, or receiving inspection may be required depending upon the use of these items in the manufacturing process. Additionally, the integrity of these types of items is verified through testing of the completed component. This requirement for a documented quality assurance program is applicable to all other safety related products and associated services.
6. Supplement 17 S-1 Quality Assurance Records. (Subsection 2.2) Generation of records. Documents that are designated to become records shall be legible, accurate and completed appropriate to the work accomplished.	Alternative Procedures identify requirements and provide guidance for completing quality assurance records. These procedures require that applicable portions of these records be completed. It should be recognized that in all cases it is not appropriate to "completely fill out" all records, particularly for those records completed on pre-printed forms.
7. Audits. Section C.3.2 of the Regulatory Guide. The applicant or licensee should either audit its Supplier's quality assurance program on a triennial basis or arrange for such audit.	Alternative A supplier holding a valid ASME Certificate of Authorization may be approved on the basis of his certificate and may receive a first purchase order provided the following conditions are met :

REG. GUIDE/ANSI STD. PARAGRAPH	FRAMATOME POSITION
	- the product or service to be procured is included within the scope of the ASME certificate, - an audit will be performed by FRAMATOME during the processing of the first purchase order. To be kept on the approved supplier list, this supplier shall be subject to an annual evaluation and then audited on a triennial basis.
8. Supplement 18 S-1 Audits. (Subsection 7.0) Follow-up actions.	Clarification Within FRAMATOME, audit follow-up actions may be delegated to an auditor other than the lead auditor or to the individual qualified for performing surveillance of the supplier. For example, audit follow-up for a supplier audit may be routinely performed by a quality engineer (other than the audit team leader) during product surveillance activities. The auditor or surveillance individual receives a check list prepared by the auditing organization, which clearly delineates the checks to be made. Results are evaluated within the auditing organization by the quality engineer responsible for evaluation of the supplier involved.

Regulatory Guide 1.29, Rev. 3
Seismic Design Classification

FRAMATOME follows the NRC Regulatory Position.

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Regulatory Guide 1.30, Rev. 0 and ANSI N45.2.4-1972
Quality Assurance Requirements for the Installation, Inspection and Testing of Instrumentation and Electric Equipment

FRAMATOME follows the NRC Regulatory Position.

+ +

Regulatory Guide 1.33, Rev. 2 and ANSI N18.7 - 1976/ANS-3.2
Quality Assurance Program Requirements (Operation)

FRAMATOME follows the NRC Regulatory Position.

+ +

Regulatory Guide 1.37, Rev. 0 and ANSI N45.2.1-1973
Quality Assurance Requirements for Cleaning of Fluid Systems
and Associated Components of Water-Cooled Nuclear Power Plants

FRAMATOME follows the NRC Regulatory Position for site activities.

+ +

Regulatory Guide 1.38, Rev. 2 and ANSI N45.2.2-1972
Quality Assurance Requirements for Packaging, Shipping, Receiving,
Storage and Handling of Items for Water-Cooled Nuclear Power Plants

FRAMATOME follows the Regulatory Position with the following clarifications and alternative.

REG. GUIDE/ANSI STD. PARAGRAPH	FRAMATOME POSITION
1. Qualification of Personnel (Section 2.4) "Those personnel who perform inspection, examination or testing [illegible] ities at the job site shall [illegible] qu 'ified in accordance with [illegible]45.. 3".	Clarification These requirements apply to FRAMATOME personnel performing inspection, examination or testing activities on site. When these activities are subcontracted, FRAMATOME identifies equivalent requirements to suppliers in its procurement documents. Alternative Requirements of ANSI N45.2.6 apply to personnel performing complicated functions such as the assembly/ disassembly of equipment, acceptance testing, non-destructive examination, etc. However, these personnel qualification requirements need not be applied to personnel performing simple functions such as warehousing, visual inspections, etc. These personnel must first meet the basic standards required for performing the job tasks. These relate to physical abilities, mental abilities, and aptitudes. Next they must have taken and passed any formal or on-the-job training associated with the involved duties including, as a minimum, the FRAMATOME QA Orientation given to all employees. Finally, they must have performed past assignments acceptably, including

REG. GUIDE/ANSI STD. PARAGRAPH	FRAMATOME POSITION
	adherence to established company policies and practices. They do not, however, receive formal qualification certificates. FRAMATOME follows the provisions of NQA-1-1983 Supplement 2 S-1 and Appendix 2 A-1 with the alternatives described for Regulatory Guide 1.28 Rev. 3.
2. Receiving (Section 5) Requirements for receiving contained in Section 5.	Clarification FRAMATOME follows this section for those portions of site activities within its scope of supply.
3. Storage (Section 6) Requirements for storage contained in Section 6.	Clarification FRAMATOME follows this section for those portions of site activities within its scope of supply.

+ +

Regulatory Guide 1.39, Rev. 2 and ANSI N45.2.3 - 1973
Housekeeping Requirements for Water-Cooled Nuclear Power Plants

FRAMATOME follows the NRC Regulatory Position with the following clarification.

Whenever FRAMATOME is involved in on-site activities, such as a major maintenance operation, FRAMATOME will conform to its usual rigorous housekeeping practices in the area of its activity, and will conform to the housekeeping requirements established for that activity by the U.S. customer ; however, FRAMATOME will not be responsible for adherence to the Regulatory Position with respect to general site or general plant requirements not directly related to the limited area involved in performing its contracted specific activity.

+ +

Regulatory Guide 1.94, Rev. 1 and ANSI N45.2.3 - 1974
Quality Assurance Requirements for Installation, Inspection, and Testing of Structural Concrete and Structural Steel During the Construction Phase of Nuclear Power Plants

This Regulatory Guide is not applicable to the FRAMATOME scope of supply.

+ +

Regulatory Guide 1.116, Rev. 0-R and ANSI N45.2.8 - 1975
Quality Assurance Requirements for Installation, Inspection and Testing of Mechanical Equipment and Systems

FRAMATOME follows the NRC Regulatory Position.

+ +

Regulatory Guide 1.143, Rev. 1

Design Guidance for Radioactive Waste Management Systems, Structures, and Components Installated in Light-Water-Cooled Nuclear Power Plants

FRAMATOME follows the NRC Regulatory Position when it is applicable to its scope of work.

TABLE 2

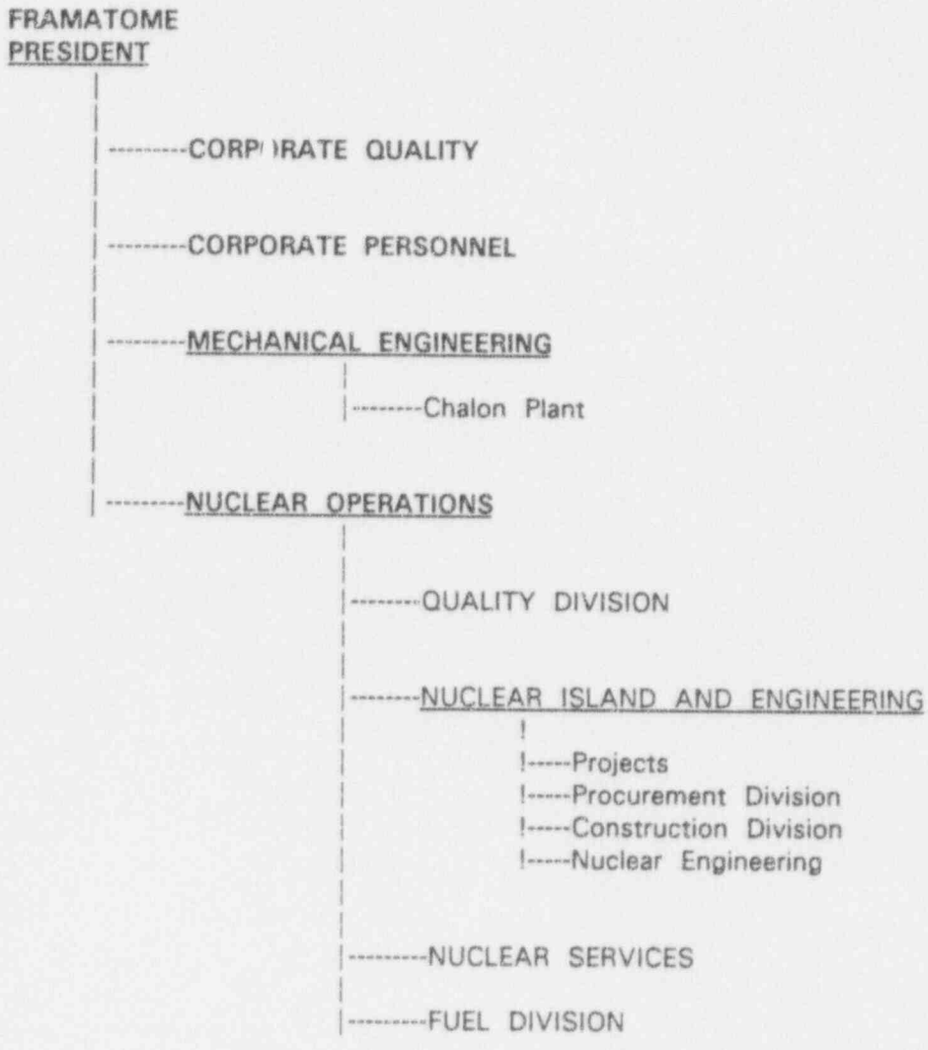
LIST OF FRAMATOME Q.A. MANUALS IMPLEMENTED

FOR U.S. ACTIVITIES

- Q.A. Manual of Nuclear Services Management	USM Manual
- Q.A. Manual for Nuclear Engineering	USE Manual
- Q.A. Manual for Manufacturing ASME components and parts by the Chalon Plant	
- Q.A. Manual of Fuel Division	USTF Manual

FIGURE 1*

FRAMATOME ORGANIZATION FOR UNITED STATES APPLICATIONS



** This chart only includes organizations and units involved in this Topical Report compliance, i.e. the 2 operational organizations (Data Processing, Connector Activities) and 1 Unit of Nuclear Operation (NOVATOME for Fast Breeder Reactor) are not mentioned.*

FIGURE 2

CHALON PLANT ORGANIZATION

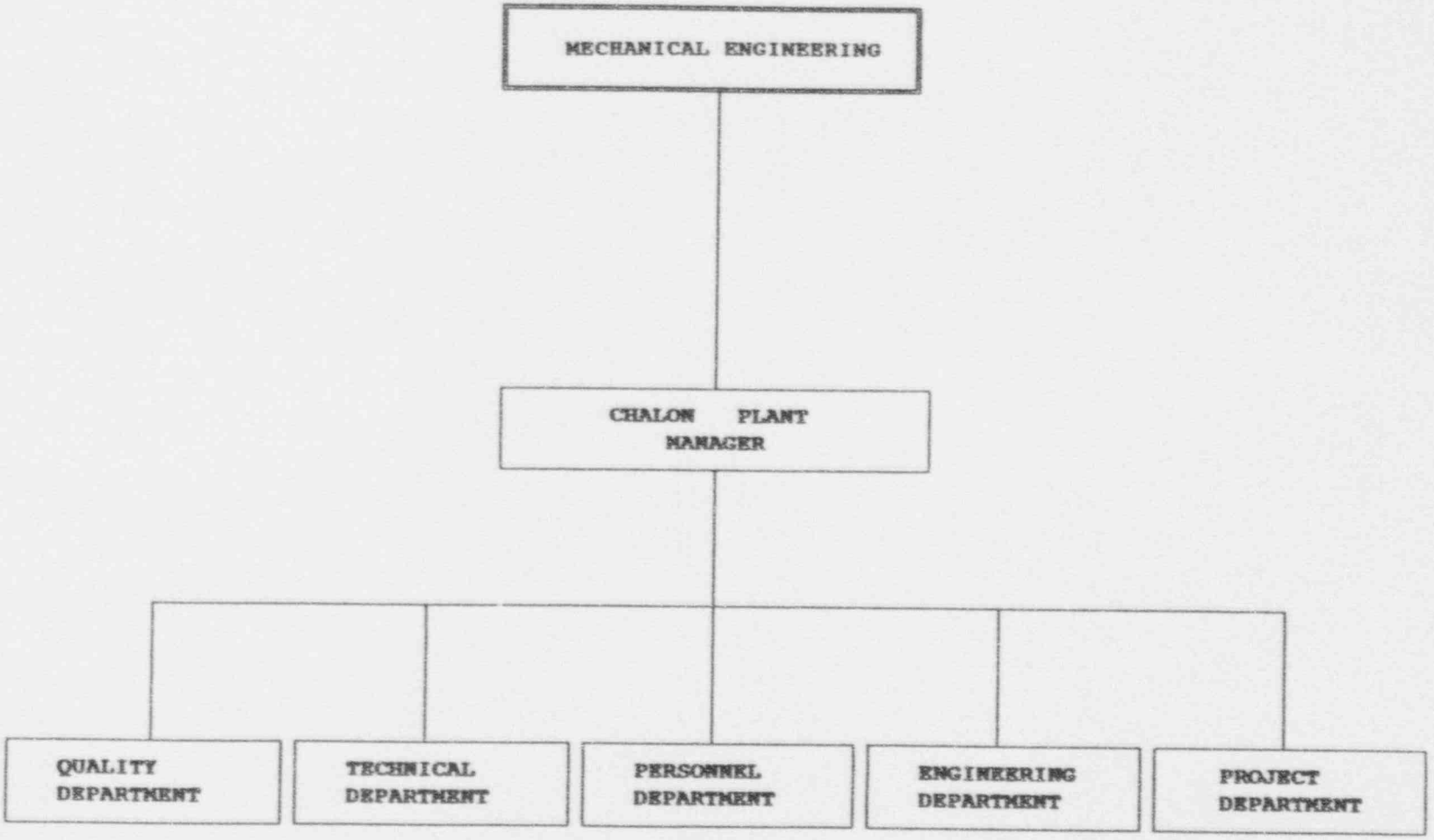
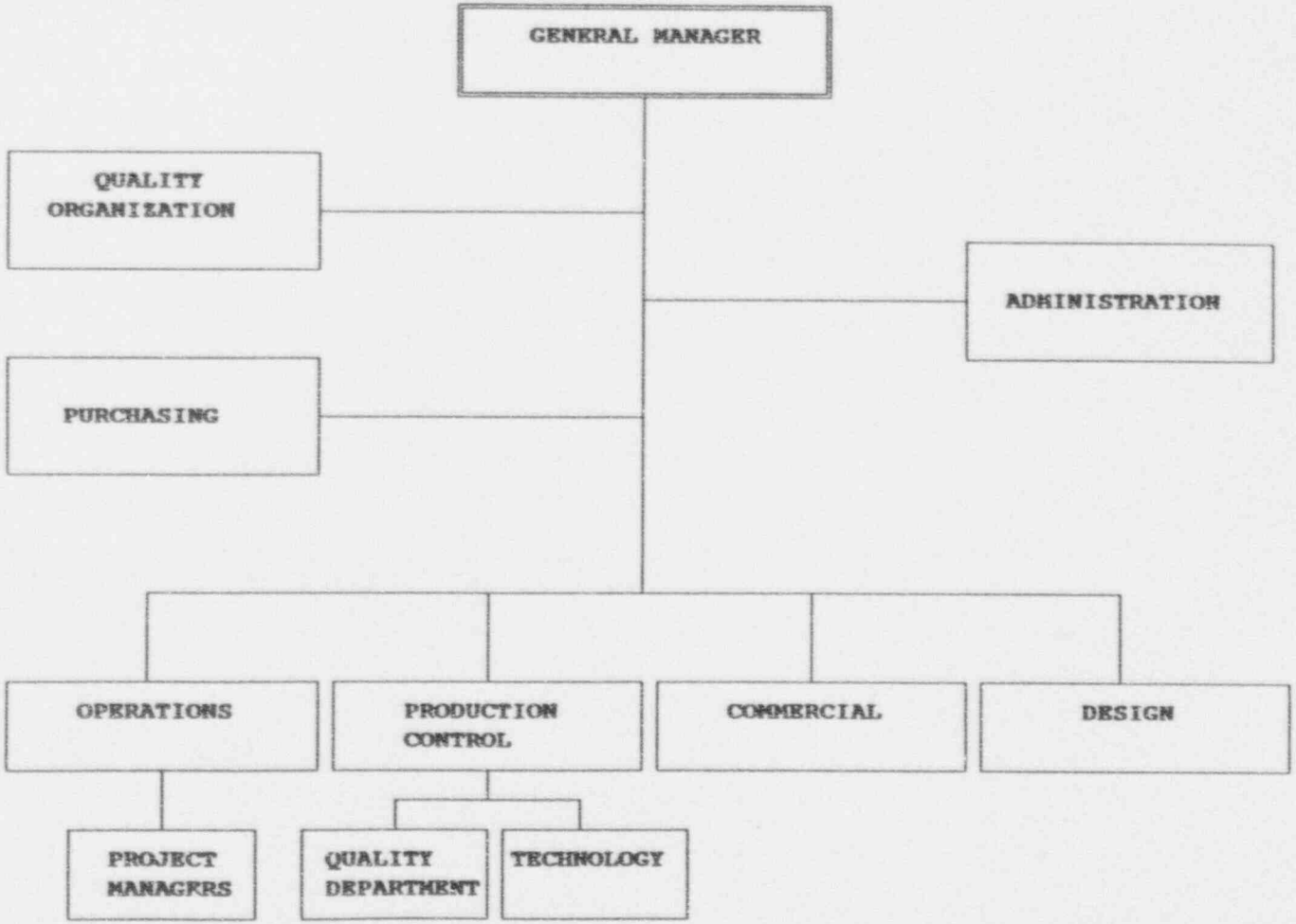


FIGURE 3

FUEL DIVISION ORGANIZATION



APPENDIX 1

PRESENTATION OF THE FRENCH SYSTEM FOR CERTIFICATION OF NON-DESTRUCTIVE TESTING PERSONNEL AND PROVISIONS MADE BY FRAMATOME FOR ITS IMPLEMENTATION

The French Standard NF A 09-010 (English version in attachment 1) issued in January 1984 by AFNOR (French Standardization Institute) reproduces the full text of the COFREND (French Committee for NDT) general regulation for the certification of NDT personnel. A copy of the English version of the Standard is provided as Attachment 1.

As shown by Attachment 2, the French practices are very similar to those recommended by the American Society For Non-Destructive Testing except for two points :

1) The certification process, and

2) The period of validity for the certification.

1. CERTIFICATION PROCESS

The certification is granted by COFREND, an independent committee whose organization, responsibilities and duties are delineated in Standard NF A 09-010. In particular, COFREND, through appropriate Sectorial Certification Committees, is responsible for managing the certification process, including the conducting of the examinations required of certification applicants.

Recognizing that qualification requirements need to be tailored to the type of industry in which the NDT personnel will be working, the Standard lists the Sectorial Certification Committees established to cover various types of industry. FRAMATOME activities are within the scope of the *"Comité Sectoriel De Certification Des Gros Equipements"* (Sectorial Certification Committee for Heavy Equipment). This Committee's practices for certification are defined in procedure GE 83.02 (See attachment 3) which defines :

- the NDT methods covered,

- training and experience requirements for level I, II and III personnel,

- recommended training programs,

- conditions for examination and grading.

Upon certification by the cognizant Sectorial Certification Committee, the recipient shall receive a working authorization from his other employer who is fully responsible for the work performed by the individual on the employer's behalf.

2 - PERIOD OF VALIDITY

In the U.S. the period of validity for certification is that set forth in recommended practice SNT-TC-1A (1980) which specifies that the initial period of validity shall not exceed 3 years and that a physical examination shall be administered on an annual basis.

The period of validity specified for the initial certification in the French Standard for level I and II personnel is limited to 5 years ; this certification may be renewed once for 5 years subject to continued and satisfactory performance. Recertification thereafter may be granted only after a practical examination organized and given by the Sectorial Certification Committee. For level III personnel, the period of validity is 3 years for the initial certification which may be renewed for 5 years subject to continued and satisfactory performance. Rectification thereafter requires a complete new practical examination organized and given by the Sectorial Certification Committee.

3. FRAMATOME PROVISIONS FOR THE PERIOD OF VALIDITY

In order to more fully conform to U.S. practices for FRAMATOME activities conducted for U.S. Customers, FRAMATOME will grant to each individual holding a COFREND certification a working authorization with an initial period of validity not to exceed 3 years. When this working authorization expires, it may be extended (or renewed) for an additional period not to exceed 3 years if warranted by satisfactory performance. This re-evaluation is documented. Re-certification will be required after a ten year period for level I and II personnel and eight years for level III personnel. All FRAMATOME NDT certified personnel are required to undergo a medical examination on an annual basis.

REGISTERED FRENCH STANDARD	NON DESTRUCTIVE TESTING CERTIFICATION OF PERSONNEL GENERAL REGULATION	NF A 09-010 January 1984

FOREWORD

The present edition of this standard reproduces the full text of the COFREND* general regulation for the certification of NDT personnel, as revised in view of the experience of the application of this regulation by the Sectorial Committees and the Certification Bureau**.

The specific procedures of each Sectorial Committee were drafted in application of this general procedure (see appended list of the Sectorial Committees).

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* COFREND (French Committee for NDT - 32, boulevard de la Chapelle - 75018 PARIS - FRANCE) groups French associations or organizations interested in NDT. Its principal aims are :

- to coordinate and develop scientific and technical research in the field of NDT conducted in French firms and public or private laboratories ;
- to perform the following duties at international level :
  . present the developments of French technology,
  . cooperate at the French level, with the international NDT organizations
- to collect and publish by all appropriate means the results of investigations and research work made either on the initiative of affiliated bodies, or on its own initiative or also from any other origin
- to promote the teaching of NDT and to organize the certification of NDT personnel.

** This edition (February 1983) supersedes that of February 1979.

Registered by decision of 1983-12-30 to take effect on 1984-01-30

This standard supersedes the Documentation Sheet of the same index dated February 1979

1. GENERAL

1.1. DEFINITIONS

1.1.1. Nondestructive testing personnel

NDT individuals concerned by this regulation are persons whose professional activity is mainly the industrial application of NDT in accordance with the regulations, codes, standards and specifications applying to the tested products.

1.1.2. Qualification

Qualification of NDT personnel includes training, experience and skill required for personnel to properly perform the duties of a specific job.

1.1.3. Certification

Certification includes all procedures and operations adopted to demonstrate the qualification of a NDT individual for a category of tasks and leading to a written testimony thereof.*

Certification is not a diploma.

1.1.4. Test method

A test method is defined by the technique adopted for the detection of defects in the tested parts, i.e. radiographic, ultrasonic, magnetic particle testing, etc.

.../...

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* By giving this meaning to the term "certification", COFREND intends to provide employers with a means for which it is responsible, enabling them to verify and attest the qualification of nondestructive testing personnel.
Employers are fully responsible for all that concerns the authorization to operate and the guarantee of nondestructive testing results.

1.1.5. Branch of industry

Branch of industry is hereafter referred to as the type of activity or industry in which the personnel to be certified shall be engaged in NDT. For instance, foundry, steelmaking, welded construction, etc., are branches of industry. These branches may be further subdivided if necessary.

1.1.6. Levels of qualification

The level of qualification of NDT personnel shall depend upon the type of work to be performed. The certification procedure shall take into account this level which shall appear on the certificate. The work to be performed according to the three considered levels is described in Appendix I.

1.2. General principles

1.2.1. Certification applies in the above defined sense to a test method used in a branch of industry. Each group level/test method/branch of industry shall be the subject of a specific examination procedure.

1.2.2. For each branch of industry, certification tests shall be supervised by a Sectorial Committee (see Chapter 3) responsible to the Certification Bureau for all certification operations. These operations shall be performed by the Sectorial Committees as regards Level 3 ; Level 1 and 2 certifications shall be conducted in Approved Centers (see Chapter 4) within the competence of each Committee. An Approved Center may cover two or several branches of industry. If such is the case, it shall be placed under the supervision of the Sectorial Committees concerned or if need be, under that of the Multisectorial Committee as defined in Paragraph 3.3. hereunder.

1.2.3. The knowledge required for certification in a NDT method used in a given branch of industry shall cover on the one hand "Basic knowledge" common to all branches of industry and on the other hand specific material depending on the branch considered. A person may be certified

for a given test method in several Sectorial Committees if after having passed the Basic part for the test method considered he passes the "Methods examinations" organized by the other Sectorial Committees whose certifications he applies for.

1.2.4. The certification operations performed by the Approved Centers under the supervision of the relevant Sectorial Committees shall be placed under the authority of the COFREND Certification Council, the necessary liaison being ensured through the Certification Bureau which is the executive organ of the Certification Council (see Chapter 2).

1.2.5. The organization of the certification scheme, which is the subject of the present General Regulation, is represented schematically by the chart in Appendix 2.

2. COFREND CERTIFICATION COUNCIL - COFREND CERTIFICATION BUREAU

2.1. In accordance with articles 3 and 15 of the COFREND Constitution, a specialized body named "Certification Council" shall be responsible for establishing and applying the COFREND certification scheme ; its competence shall also cover the decisions regarding equivalence mentioned in Paragraph 2.3., as well as contacts and negotiations to that effect.

2.2. The Certification Council comprises, as ex-officio members, the President and the Secretary General of COFREND, the Government representative as well as a representative of both Commissions 6 (training and education in nondestructive testing) and 7 (Health and safety in non-destructive testing) of the Scientific and Technical Council. The Council also comprises the representatives designated by associations, organizations or institutions, who are members of COFREND and wish to participate in the activities of that Council, on the basis of one delegate per represented association, organization or institution. If necessary, the Council may call for experts from outside COFREND. The President of the Certification Council shall be appointed by the General Assembly upon proposal of the Board of Directors.

2.3. The certification Council shall be entitled to negotiate conditions of equivalence between COFREND certification and certification according to other national or multinational schemes.

2.4. The Certification Council shall meet at least twice a year. It shall report annually to the Board of Directors on its activities.

2.5. The Certification Bureau chaired by a Director appointed by the Certification Council shall comprise in equal number, in addition to the Director and the Government representative who are ex-officio members, members nominated by the Certification Council and members delegated by the Sectorial Committees, on the basis of one per Committee. An Assistant Director shall be chosen among the members of the Bureau and appointed by the Certification Council upon proposal of the Certification Bureau.

The duration of the term of office of the members of the Certification Council and the Certification Bureau shall be specified in the Bye-Laws.

2.6. The Certification Council shall approve the creation of Sectorial Committees, examine the reports of the Certification Bureau and settle in the last instance any possible dispute arising between the Bureau and a Sectorial Committee.

2.7. The Certification Bureau shall :

a) see to the installment of the Sectorial Committees and their subdivisions if necessary. The Bureau shall also approve the procedure of these Committees,

b) confirm and register Level 3 certifications,

c) keep an updated list of Approved Centers and Level 3 personnel responsible for examinations in these Centers.

d) ensure coordination between the Sectorial Committees.

2.8. The Certification Bureau shall meet if necessary and at the request of its Director. It shall report on its activity to the Certification Council at each meeting of the latter.

2.9. The Director of the Certification Bureau or his representative selected among the Bureau members shall participate ex-officio in the work of the Sectorial Committees whenever it is related to certification operations. This participation is compulsory for Level 3 certification and for the approval of the Centers.

3. SECTORIAL CERTIFICATION COMMITTEES

3.1. In accordance with Paragraph 1.2.2., certification operations shall be conducted in each branch of industry by a Sectorial Committee. The certification procedure set up by each Sectorial Committee shall be submitted for approval to the COFREND Certification Bureau.

3.2. The Bye-Laws of each Sectorial Committee shall provide for the ex-officio participation in its certification activities of the Director of the Certification Bureau or his representative.

3.3. In order to facilitate the tests for the certification of NDT personnel whose work requires a qualification in several branches of industry, a Multisectorial Committee is created. The corresponding examinations shall be such as to ensure that individuals are capable of operating with equal ability in the various branches of industry concerned*. The responsibility of this Committee shall be similar to that of the other Sectorial Committees.

3.4. The Bye-Laws of each Sectorial Committee shall give detailed information about relationships with the Approved Centers within its competence as regards certification, at least concerning :

a) the approval of the centers and the supervision of their activity,

b) keeping a record of all NDT Level 3 personnel,

c) keeping a list of all NDT Level 1 and 2 operators certified upon completion of the certification examinations taken in the Approved Centers.

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* In order to avoid repetitions, every time a Sectorial Committee is mentioned this expression includes hereafter the Multisectorial Committee as well

d) keeping a complete list of examination questions which may be used by Approved Centers, as well as of specimens used for practical tests in these Centers,

e) centralizing and possibly verifying on the spot information from the Approved Centers concerning applications, organization and results of examination sessions as well as the questions asked,

f) directing towards the appropriate Approved Center all applications concerning personnel from firms or groups of firms not having Approved Centers.

3.5. Certificates of Level 1 and 2 operators shall be issued by the Sectorial Committees, upon proposal of the Approved Centers.

3.6. If it deems it necessary, a Sectorial Committee may, with the agreement of the Certification Bureau, prepare several certification programs corresponding to the subdivisions mentioned under 1.1.5.

3.7. The Sectorial Committees shall organize Level 3 certification examinations and transmit to the Certification Bureau their decision for confirmation and registration.

4. APPROVED CENTERS - LEVEL 1 AND 2 EXAMINATIONS

4.1. In each branch of industry, or in several of them if necessary, centers approved by the Sectorial Certification Committees concerned shall be organized in order to conduct certification examinations.

4.2. Approved Centers may be established either within firms or within technical organizations.

4.3. Approved Centers shall have all necessary staff, premises and equipment ensuring satisfactory certification operations. These facilities shall be supervised by the Sectorial Committees to which these Approved Centers are connected.

4.4. Examinations taking place in the Approved Centers shall be conducted by one or several Level 3 persons personnally appointed to that function by the Sectorial Committees concerned.

4.5. For each test method and branch of industry within its competence, an Approved Center shall have a collection of specimens approved by the Sectorial Committee, containing various identified defects corresponding to the different categories of workpieces, products or assemblies which the applicants may have to examine in the exercise of their duties. The collection shall be made up of a batch of specimens including defects comparable among the different centers and a batch of specimens freely selected by each center. The center shall have a complete test report for each specimen as well as the record of the corresponding test procedure. The collection of specimens shall not be used for the training of operators.

4.6. As regards applicants having passed successfully the certification examination, the questions, answers and grades shall be the subject of a report to the Sectorial Committee together with a draft decision. The records of all applicants shall be held at the disposal of the Sectorial Committee.

4.7. Each Approved Center shall inform the relevant Sectorial Committee of applications made and keep it informed of the calendar of examinations and their correction. The Sectorial Committee shall transmit to the Approved Centers all information available on the applicants.

4.8. Operations of the Approved Centers may be supervised on the spot by a member of the relevant Sectorial Committee.

4.9. For each operation, the Approved Center or the Sectorial Committee shall be entitled to charge a fee. The Certification Council shall be informed of the amount of that fee. In addition to this, a stamp duty shall be charged by COFREND for each certification issued.

5. APPLICATIONS (LEVELS 1 AND 2)

5.1. No evidence of education shall be required to be eligible to apply for certification.

5.2. The procedures of the Sectorial Committees specify the minimum period of theoretical education and industrial experience required before certification examinations for direct access to levels 1 or 2. This training for a given test method and branch of industry shall include the following stages :

a) theoretical education in the test method(s) applicable to all branches of industry (Basic section)

b) industrial experience in the practice of NDT, in the branch(es) of industry concerned, the applicant working under the responsibility of a certified operator.

5.3. Prior to the certification examination, a medical examination shall be given to verify the physical fitness of the candidate for the test method(s) for which he applies. The corresponding medical certificate shall be supplied by the applicant in support of his application.

5.4. If an applicant for certification is already certified by an organization other than COFREND, a request for equivalence may be made by the Sectorial Committee to the Certification Bureau who shall make the decision. This decision shall be considered as a first renewal as defined in article 9.4.

5.5. If an applicant for certification in a given test method and branch of industry proves that he has been certified for this test method in another branch of industry, he shall be exempted from the Basic examination and shall take only the Methods examination for the branch of industry in which he wants to be certified.

6. APPLICATIONS - LEVEL 3

6.1. In addition to the physical fitness attested by a certificate, applications for certification as NDT Level 3 by examination for a specific NDT method shall be examined on the basis of the following two criteria :

a) Documented educational background

b) Work experience

6.2. The experience required in the practice of NDT in order either to go from Level 2 to Level 3 or to go directly to Level 3 depends on the educational background, as follows :

	Degree	Number of years of experience
Access from Level 2 to Level 3 (number of years of experience in Level 2)	Minimum DUT or BTS	2
	No degree	4
Direct access to Level 3	BS or MS in engineering PhD, MS, BS, DEST	2
	DUT or BTS	4
	No degree	6

6.3. If an applicant is already certified by an organization other than COFREND, a request for equivalence may be made by the Sectorial Committee to the Certification Bureau who shall make the decision. This decision shall be considered as a first renewal as defined in article 10.4.

6.4. If an applicant for certification in a given test method and branch of industry proves that he has been certified for this test method in another branch of industry, he shall be exempted from the Basic examination and shall take only the Methods examination for the branch of industry in which he wants to be certified.

7. CERTIFICATION EXAMINATIONS(LEVELS 1 AND 2)

7.1. Certification examinations organized in an Approved Center at a given Level (1 or 2) shall normally cover a determined test method applied in a specified branch, as defined in Par. 1.1.5. Examinations concerning radiographic testing shall cover either X or γ rays, or both, depending on the procedures of the Sectorial Committees. Leak testing shall be subdivided into several methods.

7.2. The written and practical examination shall include two series of tests, one being called "Basic examination" and the other "Methods examination". In the Basic part, the applicant shall demonstrate sufficient proficiency in performing the relevant test method ; the Method part shall demonstrate his ability to use this test method in the branch of industry concerned.

7.3. The written part of the Basic examination shall only include questions selected from the COFREND collection of Basic knowledge questions valid at the date of the examination. The number of these questions is defined in the following table :

Test method	Number of questions	
	Level 1	Level 2
Ultrasonic testing	40	40
Magnetic particle testing	30	30
Liquid penetrant testing	30	30
Eddy current testing	30	30
Radiographic testing	40	40
Leak testing	25	30
	+5 per additional method	+5 per additional method

7.4. As regards the certification of radiographers (X and/or γ rays) not yet holders of the CAMARI*, the written part of the Basic examination shall compulsorily include not less than 10 additional questions on radiation protection, so that the COFREND qualification examination may allow to request an exemption from the examination required for obtaining the CAMARI in accordance with the ministerial decree of 2 May 1977 and its subsequent amendments.

7.5. The aim of the practical part of the Basic examination is to verify the applicant's ability to operate the test equipment and perform the required settings in order to obtain satisfactory results and make a correct interpretation thereof. Therefore, the applicant shall be required to make a demonstration supported by comments, using the means of verification available for each test method (calibration blocks, IQIs, control magnetizing samples, etc.).

7.6. The written and the practical parts of the Basic examination shall be graded separately in order that the applicant may be examined later for certification in another branch of industry without having to take the Basic examination over.

7.7. The Methods examination shall include a series of written questions on the use of the test method concerned in the branch of industry considered. These questions shall be selected from a list updated by the Sectorial Committee.

7.8. The written part of the Methods examination shall be complemented by a practical examination, consisting in testing the specimens defined in Par. 4.5.

7.9. In order to be eligible for certification, Applicants shall have a final grade at least equal to 80/100 with no individual grade below 70/100.

As regards Applicants for certification in radiographic testing and not yet holders of the CAMARI, the grade for the questions on radiation protection shall be at least equal to 50/100.

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* Certificate of proficiency in handling industrial radioscopic or radiographic equipment

7.10. The procedure of the Sectorial Committees may specify that if one/several of the 4 parts (written Basic, written Methods, practical Basic, practical Methods) is/are successfully passed, it/they will not have to be taken again provided the grade of the failed part was not below 70/100 and the Applicant is re-examined in that part and successfully passes it within 12 months after the first failure. In the case of a second failure, the Applicant shall be re-examined in all of the 4 parts.

7.11. Upon completion of the certification examination, the Level 3 individual responsible for conducting it shall send to the Sectorial Committee the documents specified in 4.6. In case of failure, the Applicant will be notified as to the reasons why he failed.

8. CERTIFICATION EXAMINATIONS - LEVEL 3

8.1. Examinations for certification as NDT Level 3 shall be organized by the Sectorial Committees. These examinations shall cover a determined test method applied in a specified branch of industry, as defined in paragraph 1.1.5. Examinations concerning radiographic testing shall cover either X or γ rays, or both, depending on the procedures of the Sectorial Committees. Leak testing shall be subdivided into several methods.

8.2. Examinations for certification as NDT Level 3 shall cover :

a) Basic knowledge relating to the test method applied for and additional Level 2 Basic examination questions relating to two other test methods selected by the Applicant. Applicants for certification in leak testing shall be exempted from these additional Level 2 Basic examination questions.

b) Specific knowledge relating to the application of this test method in the branch of industry considered. This shall include the application of standards, codes and specifications.

8.3. The examination shall be exclusively written, including the practical part.

8.4. The Basic examination shall include only questions with multiple-choice answers. These questions shall be selected from the COFREND collection of Basic knowledge questions valid at the date of the examination. The number of questions shall be as follows :

- 30 questions on the main test method
- 20 Level 2 questions on the 2 additional test methods (10 questions per method).

As regards leak testing, the number of questions shall be as follows :

- 60 questions for 3 methods applied for
- 10 supplementary questions per additional method.

8.5. As regards the certification in radiographic testing of individuals not yet holders of the CAMARI (Certificate of proficiency in handling industrial radioscopic or radiographic equipment), the Basic examination shall compulsorily include not less than 10 additional questions on radiation protection, so that the COFREND certification examination may allow to request an exemption from the examination required for obtaining the CAMARI in accordance with the ministerial decree of 2 May 1977 and its subsequent amendments.

8.6. The Basic examination shall be graded separately so that the obtained grades may be used again for Level 3 certification in another branch of industry.

8.7. The Methods examination shall include :

- 20 questions on the application of the test method in the branch of industry considered
- not less than 5 questions on the General certification Regulation, certification procedures of the Committees, codes, standards, etc.

As regards leak testing, the number of questions shall be as follows :

- 45 questions for 3 methods applied for
- 10 supplementary questions per additional method.

These questions shall be chosen from a list updated by the Sectorial Committee.

8.8. The practical examination shall include the drafting of one or more NDT Specification(s).

8.9. In order to be eligible for certification, Applicants shall have a final grade at least equal to 80/100 with no individual grade below 70/100. As regards Applicants for certification in radiographic testing and not yet holders of the CAMARI, the grade for the questions on radiation protection shall be at least equal to 50/100.

8.10. The procedure of the Sectorial Committees may specify that if one/several of the 3 parts (Basic examination, Methods examination, practical examination) is/are successfully passed, it/they will not have to be taken again provided the grade of the failed part was not below 70/100 and the Applicant is re-examined in that part and successfully passes it within one year after the first failure. In the case of a second failure, the Applicant shall be re-examined in all of the three parts.

8.11. A specific procedure may be applied for Applicants taking examinations for certification in several testing methods within a period of 12 months. It concerns the questions relating to the additional test methods as well as those relating to the General Certification Regulation, certification procedures of the Sectorial Committees, codes, standards, etc. This specific procedure is defined in the Certification procedure of each Committee.

8.12. In case of failure, the Applicant will be notified by the Sectorial Committee as to the reasons why he failed.

9. CERTIFICATION (LEVELS 1 AND 2)

9.1. Level 1 and 2 NDT operators shall be judged according to the results of the certification examination taken in the Approved Centers, which shall propose the certification to the relevant Sectorial Committee.

9.2. The Certificates and the corresponding cards shall bear the name of their holders.

In addition to the test method and the branch of industry in which certification examination is taken, these documents shall include a special space for the signature(s) of the employer(s), thereby authorizing the holder of the certificate to operate. Indications mentioned in this space shall serve as a testimony of activity of the operators concerned. The Sectorial Committees shall have the certification cards stamped by the Certification Bureau.

9.3. The period of validity of the certificate is limited to 5 years from the date of registration of the certification by the Sectorial Committee. This date shall be indicated on the certification card.

9.4. Beyond the period of validity mentioned in 9.3., certification may be renewed, subject to the results of a medical examination and provided the Applicant has continued his activity without failure or notable interruption. If this verification does not allow the renewal of the certificate, an application for re-certification shall be made as specified in 7. Upon completion of each second period of validity, certification shall be renewed provided the Applicant successfully passes a practical examination organized according to a simplified procedure.

9.5. A notable interruption means an absence or a change of activity preventing the Certificant from practicing the duties corresponding to his level in the branch of industry for which he is certified, either in one or in several periods, for a total time exceeding one year.

9.6. If the Certificant operates in another branch of industry using the same test method, in order to be certified in another branch, in as much as he meets the requirements mentioned in 9.4., he may stress that he has already passed the Basic examination according to 7. Necessary liaison shall be taken care of by the Sectorial Committees concerned. The limit of validity shall remain that of the initial certification.

10. CERTIFICATION - LEVEL 3

10.1. The decision of the relevant Sectorial Committee, which is transmitted to the Certification Bureau for confirmation and registration shall be made after examining the record including a medical certificate of physical fitness, certificates showing evidence of the work activity and the results of the examinations.

10.2. Certificates issued and the corresponding cards shall bear the name of their holders.

In addition to the test method and the branch of industry in which certification examination is taken, these documents shall include a special space for the signature(s) of the employer(s), thereby authorizing the holder of the certificate to operate. Indications mentioned in this space shall serve as a testimony of activity of the individual concerned. The card shall also bear the stamp of the Certification Bureau and the signature of its Director.

10.3. The certification as NDT Level 3 shall be valid for a period of three years.

The validity of the certification shall begin on the date of confirmation and registration by the Certification Bureau. This date shall be indicated on the certification card.

10.4. At the end of this period, certification may be renewed without re-examination for a period of five years, provided the Certificant has kept his physical fitness and has had an activity corresponding to his Level in the considered branch of industry without failure or notable interruption.

If this verification does not allow a renewal, a new certification according to the procedure specified in Chapter 8 remains possible.

10.5. Upon completion of each second period of validity, besides the verification of the physical fitness and the occupational activity, the renewal shall be obtained only after a simplified examination including :

- 20 specific questions on the application of the test method in the branch of industry considered,
- 5 questions on this Regulation.

In case of failure (final grade below 80/100 and/or 0 on the questions relating to the General Regulation), re-certification shall be issued only after a new complete examination according to Chapter 8.

10.6. A notable interruption means an absence or a change of activity preventing the Certificant from practicing the duties corresponding to his level in the branch of industry for which he is certified, either in one or in several periods, for a total time exceeding one year.

10.7. If the certificant operates in another branch of industry using the same test method, in order to be certified in another branch, inasmuch as he meets the requirements mentioned in 10.4, he may stress that he has already passed the Basic examination according to 8.

In case of transfer to another branch of industry, the limit of validity shall remain that of the initial certification. Necessary liaison shall be taken care of by the Sectorial Committees concerned.

APPENDIX I

LEVELS OF QUALIFICATION OF NDT PERSONNEL

1. LEVEL 1

Level 1 individuals shall be capable of carrying out NDT operations according to written instructions.

For this purpose, by complying with these written instructions, they shall be able to :

- carry out the setting of the equipment,
- carry out the tests,
- record the results obtained and possibly classify them in terms of the criteria specified in the written instructions and report on them.

For all these tasks, Level 1 personnel shall work according to the instructions and under the guidance of a Level 2 or Level 3 individual.

2. LEVEL 2

Level 2 individuals shall be capable of carrying out the duties corresponding to Level 1 and of checking that they are correctly executed ; they shall be able to develop NDT procedures adapted to problems being the subject of a NDT specification and to take the necessary steps for their application.

For this purpose they shall :

- have a satisfactory knowledge of the NDT method concerned and of the corresponding equipment,
- evaluate and interpret NDT results and be able to determine the conformity of the test with the codes, standards and specifications to be followed.

- operate and check the equipment,
- prepare written instructions concerning operations to be carried out by Level 1 individuals,
- direct from the technical point of view Level 1 individuals and take part in their training when requested to.

3. LEVEL 3

Level 3 individuals shall be capable of directing any NDT operation for which they are certified and of evaluating the results and determine the conformity in terms of existing codes, standards and specifications. They shall have a satisfactory knowledge of the fabrication and application of the materials and products of the branch considered in order to define working procedures and help the relevant department to establish acceptance criteria where none are otherwise available.

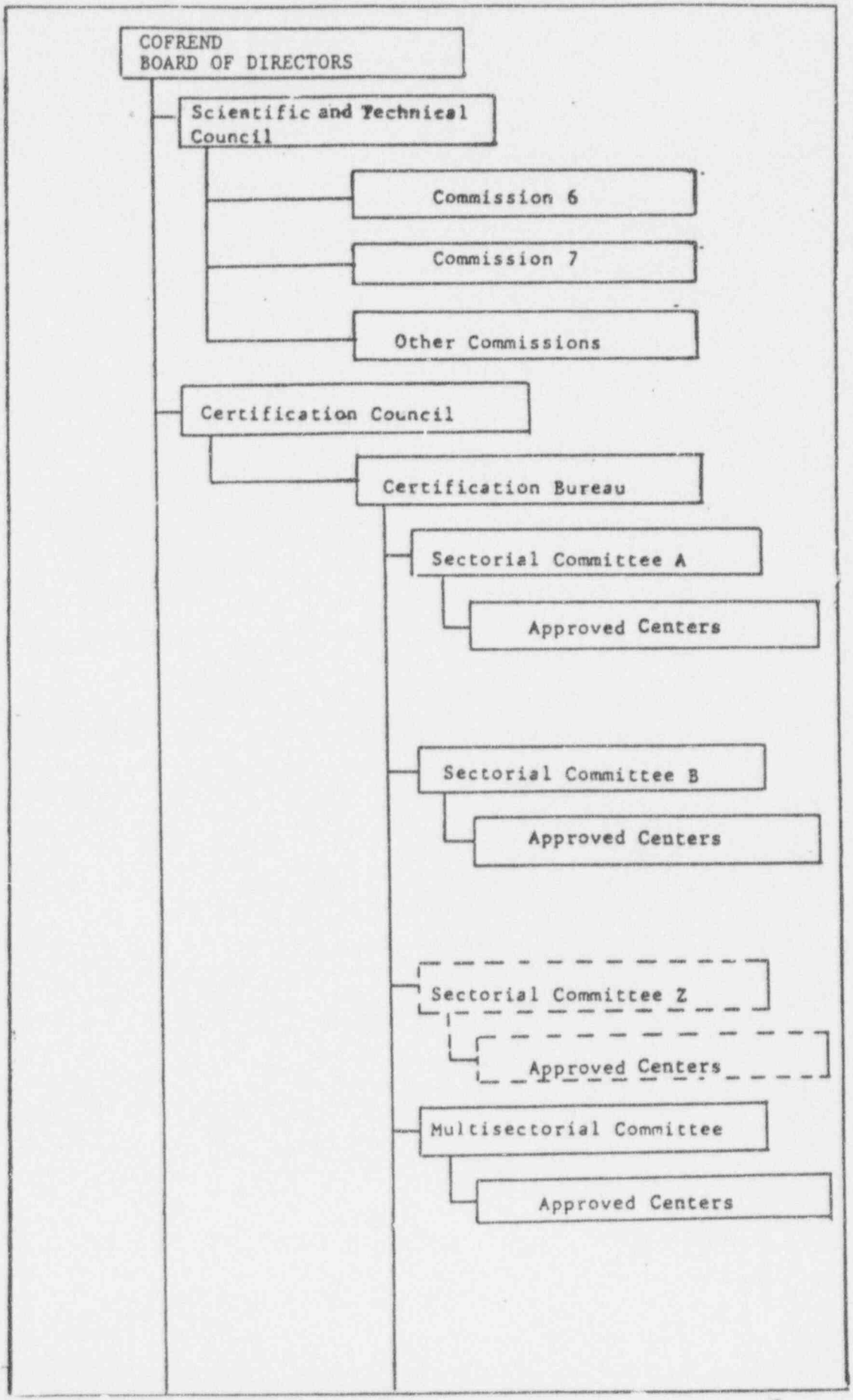
Level 3 individuals shall have a thorough knowledge of the test method for which they are certified and a sufficient knowledge of at least 2 additional NDT methods.

Level 3 individuals shall take care of the training of Level 1, 2 and 3 personnel with a view to their certification.

If requested to, they shall be responsible for the certification examinations of Level 1 and 2 personnel in the Approved Centers and take part in the correction of examinations for certification as Level 3.

APPENDIX 2

CHART OF THE COFREND CERTIFICATION SCHEME



APPENDIX 3

SECTORIAL CERTIFICATION COMMITTEES

1. Comité Sectoriel de Certification de la Sidérurgie
   (Steelmaking)
   5 bis, rue de Madrid
   75008 PARIS
   522-83-00

2. Comité Sectoriel de Certification de la Fonderie
   (Founding)
   12, Avenue Raphaël
   75016 PARIS
   504-72-50

3. Comité Sectoriel de Certification des Tubes et Produits Connexes
   (Tubes, pipes and related products)
   37, Avenue Georges V
   75008 PARIS
   723-92-10

4. Comité Sectoriel de Certification des Gros Equipements
   (Heavy equipment)
   10, Avenue Hoche
   75382 PARIS CEDEX 08
   563-02-00

5. Comité Plurisectoriel de Certification
   (Multisectorial Certification Committee)
   1, rue Gaston Boissier
   75015 PARIS
   532-29-89

6. Comité Sectoriel de Certification des Constructions Métallurgiques et du Soudage
   (Metal construction and welding)
   32, Boulevard de la Chapelle
   75880 PARIS CEDEX 18
   203-94-05

7. Comité Sectoriel Aérospatial de Certification
   (Aerospace)
   4, rue de Galilée
   75116 PARIS
   723-55-56

ATTACHMENT 2

COMPARISON BETWEEN ASNT AND COFREND REQUIREMENTS

(For Sectorial Certification Committee For Heavy Equipment)

	SNT-TC-1A (1980)	GE 83-02 (1982)
Non-Destructive Test Methodes	RT, MT, UT, PT, ET, NRT, LT and AE	RT, MT, UT, PT, ET, NRT and LT
Levels Of Qualification	3	3
Organization Responsible For Certification	Employer	COFREND + Working authorization by the employer
Requirements For Initial Certification (Level I And II)		
- Education	Taken into account for level I, II and III Personnel	Taken into account only for level III Personnel
- Training	According to the method and the education level	- According to the method - The durations of training are equal to or longer than those required by SNT-TC-IA for *"High School Graduation Or Equivalent"*
- Experience	According to the method	Equal requirements for level I, more stringent for level II
Requirements For Initial Qualification (Level III)	Education, training, experience	Equal requirements

ATTACHMENT 2 *(CONTINUED)*

COMPARISON BETWEEN ASNT AND COFREND REQUIREMENTS

(For Sectorial Certification Committee For Heavy Equipment)

	SNT-TC-1A (1980)	GE 83-02 (1982)
Requirements For Examination		
- Type	General, specific, and practical	General, specific, and practical; equivalent to SNT-TC-IA requirements
- Contents (Number Of Questions)	Varies according to the method and the level	Equal requirements
Grading		
- Composite Grading	$\geq$ 80%	$\geq$ 80%
- Passing Grade For Each Part Of The Examination	$\geq$ 70%	$\geq$ 70%
- Weighting Factors	According to the method part of examination and the level	The COFREND factors are within the authorized limits specified in SNT-TC-IA

Apper.dix 2

SECTORIAL CERTIFICATION COMMITTEE FOR HEAVY EQUIPMENT

CERTIFICATION PROCEDURE FOR NON DESTRUCTIVE TESTING PERSONNEL

SUMMARY

1. FOREWORD

The F.I.M.T.M. (Fédération des Industries mécaniques et transformatrice des métaux = Federation of mechanical and metal transforming industries) - 11 Ave Hoche, 75382 PARIS CEDEX 08 created, in 1978, the Sectorial Certification Committee for non destructive testing personnel for heavy equipment construction.

This Committee has received the task:
- to establish the certification procedure of the non destructive testing personnel relating to the manufacturing activities of heavy construction equipment industries for mechanical, mechanically-welded and boiler-worked assemblies.

- to advise companies and to coordinate their actions and to establish this procedure.

- to represent the trade in this field by national or international external organizations.

The procedure described in this field corresponds to the general regulation of the COFREND (French Committee for NDT* = Comité Français des essais non destructifs - 32 Boulevard de la Chapelle, 75880 PARIS CEDEX 18) and is comparable to the SNT-TC-1A recommendations of the AMERICAN SOCIETY FOR NON DESTRUCTIVE TESTING.

The present revision, in conformity with the documentation booklet NFA 09.010, has been approved by the COFREND Certification Bureau on the 19th. May 1983 (the original issue having been approved on the 8th. November 1978).

2. SUBJECT

This procedure indicates the conditions of certification of the non destructive testing personnel for each method listed under paragraph 6.

*NDT = non destructive testing

3. FIELD OF IMPLEMENTATION

This procedure relates to the non destructive testing of products implemented by the heavy equipment construction industries. The application of this procedure is carried out by the Sectorial Certification Committee for Heavy Equipment in liaison with the COFREND Certification Bureau. It is used within the organization of the COFREND certification system, by the Sectorial Certification Committee for Heavy Equipment and by the examination centres approved by the latter.

4. DEFINITIONS

a. Non destructive testing personnel

The non destructive testing individual concerned by this regulation is a person whose professional activity is mainly the industrial application of non destructive testing in accordance with the regulations, codes, standards and specifications applying to the tested products.

b. Qualification

In order to obtain a qualification in non destructive testing, the individual must undergo training, obtain experience and the competence required in order to enable him to properly perform the duties of his job.

c. Certification

Certification includes all procedures and operations which permit the demonstration of the qualification of a NDT individual for a category of tasks and which lead to a written testimony thereof.
Certification is not a diploma.
The employer's responsibility is entire for all operating authorization and for the NDT results guarantee.

d. Testing method

A testing method is defined by the technique adopted for the detection of defects in the tested parts (i.e. radiographic, ultrasonic, magnetoscopic testing etc.).

Note: These definitions are those of the AFNOR NFA 09.010 document.

e. Certification bodies

- for personnel levels I and 2.
Sectorial Certification Committee for Heavy Equipment by the intermediary of the approved centres.

- for level 3 personnel:
the COFREND Certification Bureau
by the intermediary of the Heavy Equipment Certification Committee.

5. CONDITIONS OF THE PROCEDURE APPLICATION

The companies subscribing to the system defined in the present procedure must respect the rules issued. The Sectorial Certification Committee ensures for the good implementation and the observance of the application of these rules.

6. NON DESTRUCTIVE TESTING METHODS

The certification of NDT personnel in conformity with this procedure is applicable to each of the following methods:

a. ultrasonic testing (UT)
b. magnetic particle testing (MT)
c. liquid penetrant testing (PT)
d. radiographic testing (RT)
e. Eddy current testing (ET)
f. leak testing (LT)
g. neutron radiographic testing (NRT)

7. LEVEL OF QUALIFICATION

The qualification of NDT personnel has to be suited to the duties to be performed. The present procedure of certification is taking into account this requirement and foresees three levels of qualification for that purpose. (see appendix I.)

8. TRAINING - EXPERIENCE

The applicant for NDT certification must have sufficient training and experience to understand the principles and the procedures of the testing methods for which he is applying.

To apply for certification, the applicant must comply with one of the criteria listed hereunder for the non destructive testing level concerned. The training and experience obtained previously to the establishment of the present procedure in the duties and in the activities equivalent to those of levels 1, 2 or 3 must be maintained and must be deducted from the criteria listed hereunder.

8.1. - Levels 1 and 2

No evidence of education shall be required in order to be eligible to apply for certification.

The table listed on page 6 specifies the minimum theoretical training and industrial experience conditions required prior to the certification examination for access to levels 1 or 2.

MINIMUM CONDITIONS REQUIRED FOR TRAINING
AND PROFESSIONAL EXPERIENCE

TESTING METHOD	TRAINING (hours)		PROFESSIONAL EXPERIENCE (months)	
	level 1	level 2	level 1	level 2
Ultrasonic testing	40	40	3	12
Magnetic particle testing	12	8	1	4
Liquid penetrant testing	4	8	1	3
Radiographic testing	40	40	3	12
Eddy current testing	24	16	1	10
Neutron radiographic testing	20	40	6	30
Leak testing (X)				
EGP	12	12	1	2
EMVP	24	20	2	6
GH	18	16	2	6
GA	24	24	4	10
He	40	32	4	10

(X) EGP leak testing under pressure of a gaseous fluid

EMVP leak testing by pressure of variation measurement

GH halogene test under pressure or under vacuum

GA NH_3 ammonia gas under pressure

HE Helium, under pressure, under vacuum or by liquid penetrant testing

Note: Experience can be acquired simultaneously in several methods. The applicant must justify an effective testing activity in each method for which he applies.

Revision March 19th. 1984

8.4. Level 3

The professional experience required in the practice of NDT in order, either for passing from level 2 to level 3, or for passing directly to level 3 depends on the educational background. This is as follows:

	Degree	Years of experience
Access from level 2 to level 3 (number of years of experience in level 2)	DUT or BTS at minimum	2
	no degree	4
Direct access to level 3	BS or MS in engineering PhD, MS, BS DEST	2
	DUT or BTS	4
	no degree	6

9. RECOMMENDED TRAINING PROGRAMMES

The individual for whom training is required must follow the appropriate teaching method to become entirely familiar with the principles of the testing method considered and with the codes or specifications applied to the product to be tested, at the desired level of qualification.

The main lines of the theoretical training courses are defined in the COFREND documents and cover the following activities:

ultrasonic testing
magnetic particle testing
liquid penetrant testing
radiographic testing
Eddy current testing
leak testing
neutron radiographic testing

10. EXAMINATIONS LEVEL 1 OR 2

Applicants to the examination of certification levels 1 or 2 must fulfil the conditions of the present procedure. The examination will be organized in an approved centre recognized by the Sectorial Certification Committee for Heavy Equipment.
A level 3 individual is responsible for the conducting and the grading of level 1 or 2 applicants.
The examination shall include four series of tests, two of basic knowledge questions (common trunk) and two of methods knowledge.

10.1. Physical examination

Prior to the examination at the approved centre, the applicant should present a physical fitness medical certificate which must comply with the regulations indicated in Appendix 2.

10.2 Written examination

a. Basic knowledge (common trunk)

The written examination deals with the fundamental principles of testing relating to the method concerned for the level required.

For the examination, the level 3 individual responsible for the certification selects only from the COFREND collection of basic knowledge "common trunk" questions, valid on the date of the examination, and appropriate questions covering the method concerned for the required level.

As regards the certification of radiographers (X and/or γ rays) who are not yet holders of the CAMARI, the written part of the basic (common trunk) examination must include 10 additional questions on radiation protection, so that the COFREND certification examination may allow him to request exemption from the examination required for obtaining the certificate of proficiency in handling industrial radioscopic or radiographic equipment, (CAMARI), in accordance with the ministerial decree of 2 May 1977 and its subsequent amendments.

b. Methods knowledge

For this examination, the level 3 individual responsible for it selects from the approved methods questionnaire the appropriate questions in their necessary number for the required level.

10.3. Practical examination

a. Basic section (common trunk)

The applicant for certification must show his ability to operate the necessary testing equipment and his ability to analyse the resulting information at the required level.

b. Methods section

The applicant for certification must be able to test at least one sample of the Sectorial Committee's specific collection and he must be able to interpret the results.

The identification of the sample(s) of the test procedure and the results are subject to a written record annexed to the certification dossier.

After having had the possibility to practise with the available material in the approved centre and also on samples other than those used for the examination, the applicant will be judged on two distinct sections, the basic section and the methods section.

11. EXAMINATION LEVEL 3

The level 3 examination is subject to examination as defined under paragraph 12.3 and is carried out under the responsibility of the Sectorial Certification Committee.

11.1 Physical examination

Prior to the examination at the Sectorial Committee, the applicant should present a medical certificate of physical fitness which must comply with the prescriptions indicated in Appendix 2.

11. 2. Written examination

The examination must be written only. The modalities are indicated in chapter 12.3.

12 CONTENT OF THE EXAMINATIONS

This paragraph defines the content of the examinations for each level and each method. The written examinations are carried out without documents. The data, in the form of graphics or numerical tables will be supplied if necessary. The duration of the examination for levels 1 and 2 is based on the 30 minutes rule per ten questions.

12.1. - Level 1

a. written examination

The applicant must answer the questions selected by the level 3 individual responsible for the examination and whose number per testing method is as follows:

Testing method	basic knowledge (common trunk)	methods knowledge
ultrasonic testing	40	20
magnetic particle testing	30	20
liquid penetrant testing	30	20
radiographic testing	40(+10 CAMARI)	20
Eddy current testing	30	15
neutron radiographic testing	25(+5 by additional method)	10(+5 by additional method)

As far as possible the questions relating to the methods knowledge should be chosen in such a way as to cover all the branch of the industry considered (welding, rolled products etc.).

b. practical examination

The applicant must show his ability to perform the NDT and to evaluate the results obtained on one or several samples selected by the level 3 individual responsible for the examination.
For that purpose the examination includes no less than 10 verification points.
The applicant must be judged on two distinct sections:

- the basic section: 4 verification points at least requiring the knowledge to operate the equipment according to the written instructions received, the settings chosen and the correct working of the equipment.

- the methods section: 6 points of verification at least, requiring the understanding and the use of a particular specification, the examination of the forementioned samples, the recording of the results.

12.2. Level 2

a. written examination

The applicant must answer the questions selected by the level 3 individual responsible for the examination and whose number per testing method is as follows:

Testing	Basic knowledge (common trunk)	Methods knowledge
ultrasonic testing	40	20
magnetic particle testing	30	20
liquid penetrant testing	30	20
radiographic testing	40(+10 CAMARI)	20
Eddy current testing	30	15
neutron radiographic testing	40	15
leak testing	30(+5 by additional method)	10(+5 by additional method)

As far as possible, the questions relating to the methods knowledge should be chosen in such a way as to cover all the branch of the industry considered (welding, rolled products etc.)

b. practical examination

The applicant must show his ability to perform the NDT and to evaluate the results obtained on one or several samples, selected by the level 3 individual responsible for the examination. For that purpose, the examination includes no less than 10 verification points. The applicant will be judged on two distinct sections.

- the basic section: 4 verification points at least requiring the knowledge of operating the equipment and the obtaining of the required settings.

- the methods section: 6 points of verification at least, requiring the understanding and the use of a particular specification, the examination of the forementioned samples, the drafting of the examination report, which must include the interpretation of the results and judgement in compliance with the specifications.

12.3. Level 3

Examinations for level 3 certification include:
- a basic "common trunk" relating to the testing method;
- the application of this testing method to the branch of industry concerned by Heavy Equipment Construction, standards, codes ..... applying included.
- additional knowledge of the level 2 basic "common trunk" relating to 2 other testing methods chosen by the applicant. The applicants for certification in leak testing are exempt from these additional level 2 basic "common trunk" questions.

Basic "common trunk" examinations are graded separately so that the grades obtained may be used again for the level 3 certification in another branch of industry.

The leak testing procedure is subdivided into several methods:

EGP leak testing under pressure of a gaseous fluid
EMVP leak testing by pressure variation measurement
GH leak testing by halogene under pressure or under vacuum
GA leak testing by NH_3 ammonia gas under pressure
He leak testing with helium under pressure, under vacuum or by liquid penetrant testing

The examination must be written only and must include the practical section. Its content is as follows:

a. Basic examination (common trunk)

The basic examination must only include questions with multiple-choice answers. These questions must be selected from the COFREND collection of basic knowledge questions valid on the date of the examination.

Number of questions:
- 30 questions on the main testing method
- 20 level 2 questions on the two additional testing methods (10 questions per method).

As regards leak testing, the number of questions must be as follows:
- 60 questions for 3 methods applied for
- 10 additional questions per additional method

As regards the certification in radiographic testing of individuals who are not yet holders of the CAMARI (certificate of proficiency in handling industrial radioscopic or radiographic equipment), the basic "common trunk" examination must include no less than 10 additional questions on radiation protection so that the COFREND certification examination may allow him to request exemption from the examination required for obtaining the CAMARI in accordance with the ministerial decree of May 2nd. 1977 and its subsequent amendments.

b. Methods examination

The applicant should answer:
- 20 questions on the application of the testing method concerned, in the branch of the Heavy Equipment Construction.
- 5 questions on the General Certification Regulation, certification procedures of the Sectorial Certification Committee of Heavy Equipment, codes, standards etc.

As regards leak testing, the number of questions must be as follows:
- 45 questions for 3 methods applied for
- 10 additional questions per additional method
These questions must be chosen from the approved methods questionnaire.

c. practical section

The applicant must draft the testing instructions for the testing method concerned and whose subject is determined by the Sectorial Certification Committee of Heavy Equipment.

Note: Particular case for applicants taking the examination for certification in several testing methods:
According to the procedure of the Committee, an applicant taking the examination for certification in several testing methods, must answer each time the questions of procedures as well as the basic level 2 questions as shown in the example below:

Examinations	level 3	additional methods	questions of procedures
1st examination	UT	MT + PT	x
2nd examination	MT	UT + PT	x
3rd examination	PT	UT + MT	x

In fact, this example shows that the applicant answers level 2 questions twice and procedure questions three times.

To ease this system and to avoid taking the same test several times, the applicant has the choice between all the tests or having the benefit of the following rule:
- The rule mentions that the applicant takes each test relating to the additional methods (level 2 question) at least once and the test relating to the questions of procedure at least once provided that he successfully passed the first certification examination.
In the case of the forementioned example of the 2nd examination, he will only pass , if the UT level 2 test grade obtained for the PT during the first examination as well as the one relating to the procedure is taken into account for the calculation of the composite grade of the second examination.

For the 3rd. examination the applicant must only take the basic test of the level 3 questions provided that he has passed the 2nd. examination. In order to keep the benefit of this rule, the different certification examination must be taken within a maximum of 12 months.

13. GRADING

13.1 Levels 1 and 2

The conducting and the grading of the examinations of every level 1 and 2 applicant are the responsibility of the level 3 individual responsible for the certification.

Each test is graded as a percentage. A factor is applied which permits the obtaining of a weighted grade for each written and practical examination, basic section and methods section.

The same factors apply to every testing method. They are chosen in such a way that, for a given level the sum of the factors to be applied is equal to 1 for each examination.

Written examination	level 1	level 2
- basic	0,2	0,3
- methods	0,2	0,3
Practical examination		
- basic	0,2	0,1
- methods	0,4	0,3

The composite grade (N) to be taken into account for the certification is determined as follows:

$$N = Ng \times Kg + Ns \times Ks + Npg \times Kpg + Nps \times Kps$$

where:

- N = composite grade
- Ng = effective grade obtained at the basic written examination
- Ns = effective grade obtained at the methods written examination
- Npg = effective grade obtained at the basic practical examination
- Nps = effective grade obtained at the methods practical examination
- Kg = factor of the basic written examination
- Ks = factor of the methods written examination
- Kpg = factor of the basic practical examination
- Kps = factor of the methods practical examination

A composite grade equal to 80/100 or more is required for the certification. The grade for each written and practical examination, basic section and methods section must be at least equal to 70/100.

As regards applicants for certification in radiographic testing and who are not yet holders of the CAMARI, the grade concerning the questions on radiation protection must be at least equal to 50/100.

The written and practical basic "common trunk" examinations are subject to separate grading in order to allow the applicant to apply, without reexamination of the basic "common trunk" questions for a certification in another branch of industry.

An applicant for certification maintains the benefit during 12 months of one or several of the 4 examinations (basic "common trunk" written examination, methods written examination, basic "common trunk" practical examination, methods practical examination) successfully passed, provided the grade of the failed section was not below 70/100. Under these conditions and for the section subject to examination it is the second grade which is taken into account. In the case of a second failure, the applicant must be reexamined in all of the tests.

13.2 Level 3

The examination is graded by the Sectorial Certification Committee. The quotation for each of the fields defined in paragraph 12.3 is as follows:

a. basic examination (basic "common trunk")

$$\text{Grade } Ng = \frac{3\,N_3 + 2N_2}{5}$$

where:
- Ng = grade obtained for the basic examination
- N_3 = grade obtained for the level 3 questions
- N_2 = grade obtained for the level 2 questions of the two additional methods

This calculating is valid for all methods, except for the radiographic testing where the following formula has to be taken into account:

$$N_g = \frac{2\,N_3 + N_2}{3}$$ due to the 10 questions of radiation protection which are added to the 30.

As for levels 1 and 2, the grades are given for the 40 questions, the grade concerning the questions on "radiation protection" also being given separately in view of the CAMARI.

b. methods examination

The formula is;

$$N_s = \frac{4\,N_3 + N_A}{5}$$

where: N_s = grade obtained for the methods examination

N_3 = grade obtained for the level 3 methods questions

N_A = grade obtained for the questions called procedures (procedures, codes etc.).

c. compositegrade

After applying the factors according to the procedure of the Committee, the composite grade is calculated by the relation:

$$N = 0{,}4\,N_g + 0{,}3\,N_s + 0{,}3\,N_p$$

where N_p = grade obtained for the practical examination.
A composite grade equal to 80/100 or more is required for the certification without a grade below 70/100.

For applicants to the certification in radiography who are not yet holders of the CAMARI, the composite grade concerning the radiation protection questions must be at least equal to 50/100.

The basic "common trunk" questions are graded separately so that the grades obtained can be used for the level 3 certification in another branch of industry.
An applicant for certification maintains the benefit for 12 months of one or several of the 3 examinations (basic "common trunk" examination, methods examination, practical examination) successfully passed, provided that the grade of the failed section was not below 70/100.
Under these conditions and for the section subject to examination, it is the second grade which is taken into account.

In the case of a second failure the applicant must be reexamined in all of the tests.

14. CERTIFICATION

14.1 Levels 1 and 2

Level 1 and 2 individuals shall be judged according to the results of the examinations taken in the approved centres. After the examination, the level 3 individual responsible for the examination sends to the Sectorial Certification Committee his conclusions for the applicants who passed the examination successfully.

The dossiers of each applicant are kept at the disposal of the Sectorial Certification Committee for Heavy Equipment.

The certificates of levels 1 and 2 individuals are delivered by the Sectorial Certification Committee for Heavy Equipment and upon proposal of the approved centre and sent jointly with the conclusion report.

Any failure is directly notified to the applicant by the approved centre as to the reasons why he failed.

Each certificate shall bear the name of its holder. The corresponding card is handed personally to the latter so that he may present it on demand during his duties.

Besides the mention of the testing method and its application, branch (Heavy Equipment Construction) in which the certification is taken, the certificates bear a special space for the signature(s) of the employer(s) thereby authorizing the holder to work. Indications mentioned in this space must serve as a testimony of the activity of the operators concerned.

The certification card must be stamped by the certification Bureau. The period of validity of the certificates is limited to 5 years from the date of registration of the certification by the Sectorial Committee for Heavy Equipment, whatever testing method is used.

After the 5 years of validity the certification may be renewed:

a. Upon request to the Sectorial Certification Committee of Heavy Equipment subject to the results of a medical examination and to the verification of the applicant's activities during the period of validity. In particular, the applicant must not have had any interruption exceeding one year, either in one or several periods in the practice of his duties corresponding to his level in the field of application of the Heavy Equipment.

At the end of the second period of validity, certification shall be renewed provided that the applicant successfully passes a practical examination organized according to a simplified procedure.

b. Upon reexamination in accordance with paragraphs 10 and 12: In case the practice of his duties is not performed with satisfaction, the certification may be submitted for reexamination prior to the end of the normal delay.

14.2 Level 3

Level 3 individuals are judged by the Sectorial Certification Committee for Heavy Equipment which transfers the certification for confirmation and registration to the Certification Bureau. Level 3 certification is granted for three years from the date of confirmation and registration at the Certification Bureau.

Upon completion of this period this certificate of an individual can be renewed for another period of 5 years provided that the required physical fitness is maintained and provided that the certificant has practised an activity corresponding to his level in the considered branch of industry without failure or notable interruption.

If this verification does not allow a renewal a new certification according to the procedure specified in para. 12.1 remains possible.

Upon completion of each second period of validity, besides the verification of the physical fitness and the professional activity the renewal can be obtained only after a simplified examination including:

- 20 methods questions concerning the application of the method in the considered application branch.

- 5 questions concerning the COFREND certification regulation.

In case of failure (composite grade below 80/100 and/or 0 on the questions relating to the General Regulations) recertification can only be issued after a new complete examination according to paragraph 12.3.

A notable interruption means an absence or a change of activity preventing the certificant from practicing the duties corresponding to his level in the branch of industry for which he is certified, either in one or several periods, for a total time exceeding one year.

The information relating to the certified individual must be recorded in the standard dossier annexed to the present procedure.

This dossier must include the following four documents:

1. a curriculum vitae with:

Full name of the individual
Date of birth
The individual registration number in the company
The studies followed (level of education reached and diplomas obtained)
The after-school training followed
The professional experience acquired
The date of entry into the company and the successive functions within the company

2. a medical certificate certifying:

The visual examination
The physical fitness for the testing method for which the individual has been certified

3. the technical notice including:

The qualification of the individual: nature of the testing method, level of qualification, type of products to test, the professional experience relating to the qualification technique and the training followed.

The results of the examinations: grades of the various examinations, the factors used and the composite grade obtained.

4. the certification document:

in the testing method, as well as the recertification dates.

For levels 1 and 2, the dossier must include the signature of the level 3 individual responsible for the certification, the signature of the employer which authorizes them to operate and the signature of the Sectorial Certification Committee for Heavy Equipment.

For level 3, the dossier must include the signature of the employer and the signature of the Sectorial Certification Committee for Heavy Equipment.

15. TRANSFER TO ANOTHER BRANCH OF INDUSTRY

In case of transfer to another branch of industry without change in the testing method, the interested individual may refer, in order to obtain his certification in another branch, to the examinations of the basic "common trunk" he passed according to paragraph 12, for the level considered, as long as he satisfies the conditions of the medical examination and those concerning his activity in the testing method considered. The date of the end of the validity is that of the initial certification.

APPENDIX 1

LEVELS OF QUALIFICATION OF NDT PERSONNEL

1. LEVEL 1

Level 1 individuals must be capable of carrying out NDT operations according to written instructions:

For this purpose, by complying with these written instructions, they must be able to:

- carry out the setting of the equipment
- carry out the NDT
- record the results obtained and possibly classify them in terms of the criteria specified in the written instructions and report on them.

For all these tasks, Level 1 personnel must work according to the instructions and under the guidance of a Level 2 or Level 3 individual.

2. LEVEL 2

Level 2 individuals must be capable of carrying out the duties corresponding to Level 1 and of checking that they are correctly executed. They must be able to develop NDT procedures adapted to problems being the subject of a NDT specification and of taking the necessary steps for their application.

For this purpose they must:

- have the satisfactory knowledge of the NDT method concerned and of the corresponding equipment.
- evaluate and interpret NDT results and be able to determine the conformity of the tests with the codes, standards and specifications to be followed.
- operate and check the equipment
- prepare written instructions concerning operations to be carried out by Level 1 individuals.
- direct from the technical point of view Level 1 individuals and take

3. LEVEL 3

Level 3 individuals must be capable of directing any NDT operation for which they are certified and of evaluating the results and determine the conformity in terms of existing codes, standards and specifications. They must have a satisfactory knowledge of the fabrication and application of the materials and products of the branch considered in order to define working procedure and help the relevant department to establish acceptance criteria where non are otherwise available.

Level 3 individuals must have a thorough knowledge of the testing method for which they are certified and a sufficient knowledge of at least 2 additional NDT methods.

Level 3 individuals must take care of the training of level 1,2, and 3 personnel with a view to their certification.

If requested to, they must be responsible for the certification examinations of Level 1 and 2 personnel in the approved centres and take part in the correction of examinations for certification as Level 3.

APPENDIX 2

PHYSICAL EXAMINATION

1. An examination must be carried out in order to ensure the natural or corrected near distance acuity in at least one eye is such that the applicant is able to read at a distance of 33 cm minimum, the n° 2 letters of the Dr. Parinaud test chart.

The test is carried out under the responsibility of the factory doctor at least once a year. The results of the examinations are kept in the dossier of the individual during the certification validity period.

2. The applicant should also be capable of distinguishing and differentiating the contrast between the colours used in the testing for which he is qualified. (Ishihara book)

3. This specific examination does not exempt him from the regular physical examinations which are under the full responsibility of the employers as well as the particular physical examinations considered as necessary by the employer.

APPENDIX 3

CERTIFICATION DOSSIER
OF NON DESTRUCTIVE TESTING PERSONNEL
ACCORDING TO THE PROCEDURE OF THE:
SECTORIAL CERTIFICATION COMMITTEE FOR HEAVY EQUIPMENT

METHOD .....
LEVEL .....

COMPANY.....
SHOP.....

SURNAME .....
FORENAME.....

REGISTRATION NUMBER .....

DOCUMENTS WHICH ARE PART OF THE DOSSIER

1. Curriculum vitae
2. Medical certificate
3. Results of the examination
4. Certificate

1. CURRICULUM VITAE

TESTING METHOD .....
LEVEL.....

SURNAME.....
FORENAME.....
DATE OF BIRTH.....

COMPANY - SHOP.....
REGISTRATION NUMBER IN THE COMPANY.....

SCHOOL RECORD

- Level of education reached .....
- Diplomas obtained .....
- After-school training.....
- Professional experience.....
- Date of entry into the Company.....
- Successive functions in the Company with the corresponding dates .....

2. MEDICAL CERTIFICATE

TESTING METHOD .....
LEVEL.....
SURNAME.....
FORENAME.....
NUMBER OF REGISTRATION.....

VISUAL ACUITY

Ability to read with at least one eye with natural or corrected near distance acuity, the n° 2 letters of Dr Parinaud, at a distance of a minimum of 33 cm

DISTINCTION OF COLOURS

Distinction and differentiation of contrast between the colours used in the method for which the individual is certified (Ishihara book).

GLOBAL RESULTS OF EXAMINATION

Mr .....

is qualified — without correction of the visual acuity
with correction of the visual acuity

..... — The .....

The doctor — certified by level 3 individual responsible for the certification (for levels 1 and 2)

certified by the employer (for level 3)

3. RESULTS OF THE EXAMINATION

TESTING METHOD .....

LEVEL .....

SURNAME .....

FORENAME .....

1. QUALIFICATION

- nature of the non destructive testing method
- level of qualification
- type of products to be tested
- codes usually used
- professional experience relating to the technique of qualification (foresee appendix notice)
- training followed (foresee appendix notice)

2. EXAMINATIONS

- dates of qualification examinations
- results of the examination
- questions submitted and answers given (foresee appendix notice)

EXAMINATIONS		grade (%)	factor	weighted grade
Levels 1 and 2	Level 3			
basic written exam methods written exam basic practical ex. methods practical ex.	basic written exam methods written exam basic practical exam basic pract. ex.			
radiation protection	radiation protection			
		COMPOSITE GRADE		

NAME & signature of the level 3 individual responsible for the certification (for levels 1 & 2)

OR

Signature of Certification Committee (for level 3)

4. CERTIFICATE

TESTING METHOD .....
LEVEL .....

SURNAME.....
FORENAME.....
REGISTRATION NUMBER.....

has been certified on .....
in the following testing method .....
of level .....
according to the procedure of the
HEAVY EQUIPMENT CONSTRUCTION

DATE OF CERTIFICATION	REFERENCE OF THE PROCEDURE

At..... the ..... 19.....

Signature of the level 3 individual responsible for the certification (level 1 & 2) OR Signature of the Sectorial Certification Committee (for level 3)

Signature of the employer (for all levels)