QUALITY ASSURANCE OF SHIPPING CONTAINERS

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Naval Nuclear Fuel Division
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Revision 2

Signature

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ii. INTRODUCTION

PURPOSE:

This plan defines the quality assurance program to be applied by the Naval Nuclear Fuel Division to the design, fabrication, testing, inspection, use, and repair of radioactive materials shipping container which are subject to the QA requirements of 10 CFR 71. This document excludes those shipping containers constructed, maintained and used solely by/for Naval Reactors under the Department of Energy.

SCOPE:

Management policy incorporates high standards of quality not only relative to product, but also where employee and public safety is concerned. The Quality Assurance program is established to assure that shipping containers are designed, built, and used in an orderly manner and in accordance with established criteria and regulations.

Shipments of radioactive material from NNFD are of a relatively narrow scope and consist chiefly of:

(1) Unirradiated, high enriched fuel, samples and clad elements

(2) Unirradiated scrap and waste materials or contaminated material for burial

(3) Unirradiated recovered scrap (UNH crystals).

(4) Sealed B/Y emitting sources used for activations analysis, calibration, and other analytical purposes.

Consequently, radioactive material shipping containers anticipated to be used by NNFD are relatively uncomplicated and the QA program has been limited to those areas where manufacturing and use specifications impact nuclear or radiological safety. Due to the variability between container designs and types, no attempt is made in this plan to define applicability of specific requirements to individual

containers, (i.e., which components are safety related). Such decisions will be made on a case-by-case basis by management.

DISTRIBUTION AND APPROVALS:

The following limitations will be applied to the distribution and use of this plan:

(1) The plan and revisions thereto will, at a minimum, be approved by the Manager, Materials Management, and Manager Nuclear Materials Control.

(2) Distribution of this manual will be controlled by NMC to provide assurance that there is adequate dissemination of information and maintenance of the current version in the distribution chain.

Subsequent sections of this manual describe the implementation of the criteria specified in Appendix E of 10 CFR 71. As noted above, individual consideration of these criteria is predicated on the importance of safety and proper use of a container and considers the level or risk involved.

Delegation of individual functions specified within this plan may be undertaken by management in accord with established policy.

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1.0 Organization

1.1 Scope

NNFD may fabricate containers internally or employ a vendor for either design or fabrication. Additionally, nuclear safety evaluations or other specialized functions may be delegated to consulting organizations. This section provides, in general, the QA controls necessary to assure that final responsibility remains with NNFD as the licensee, and that individual approval and associated QA functions within NNFD maintain independence from the design, fabrication, and use functions.

1.2 Personnel Qualifications

Personnel reponsible for shipping container QA functions are appropriately trained and educated so as to understand and implement QA functions.

1.3 Organization

Implementation and maintenance of the QA program for manufacture (if appropriate), use, and repair of radioactive material shipping containers utilized shall be the responsibility of NNFD management. NNFD organization (Appendix A) is such that the plant organizations responsible for the QA program are functionally independent and have authority to approve procedures, implement changes or corrective actions, and to terminate container use, if necessary, until improper conditions have been completed and approved.

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The principal responsibilities and authorities for the Quality Control Program are vested in the following positions.

1.3.1 Manager, Nuclear Materials Control

The direct organizational responsibility for implementing the Quality Assurance Program lies with the Manager, Nuclear Materials Control. He reports directly to the Materials Management Manager and is wholly independent of other plant operations, thus assuring independence in carrying out the functions of checking, inspecting, auditing, and otherwise verifying that work has been performed satisfactorily such that the containers conform to applicable specifications.

Specifically, the Manager of Nuclear Materials Control is responsible for assuring the implementation of all quality related factors. In the Procurement of shipping containers he is responsible for assuring the Quality Control Program relating to the purchase order specifications, vendor quality assurance requirements, vendor system audits, and inspections. He is responsible for asssuring plant audits to assess the overall effectiveness of the quality program. He is responsible for the review and approval of all vendor quality assurance programs. He has the authority to withhold from further processing or use any components, which do not meet applicable specifications.

The position of Manager, Nuclear Materials Control shall require a Bachelors degree or equivalent, in addition to five-seven years experience necessary to gain knowledge of nuclear material handling and disposal, Nuclear Regulatory Commission Requirements, safety practice and control of radioactive contamination.

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1.3.2 Nuclear and Radiological Safety

Nuclear and Radiation Safety personnel report directly to the Manager, Nuclear Materials Control and Manager, Radiation Control and are responsible for preparing and executing procedures that control nuclear and radiological safety, respectively. Typical nuclear and radiological safety responsibilities include: appropriate inspections, radiation surveys, proper labeling of shipping containers and vehicles, proper generation and retention of safety documentation, and the overall enforcement of health physics and nuclear safety standards. These sections have the freedom and authority, if necessary, to terminate the use of a shipping container if the nuclear or radiological standards are not satisfied.

The Manager, Nuclear Materials Control is responsible to assure that container design and use is in compliance with regulatory criteria. In the case of new container design and fabrication, the Manager, Nuclear Materials Control will be responsible for coordinating and approving nuclear and radiological safety evaluations necessary to assure safety.

1.4 Interrelationships

Interfaces within the QA program are assured through assigned responsibility and the division's policy to adhere to all requirements. Nuclear Material Control has responsibility to coordinate all such activities. Other sections within NNFD may be assigned responsibility to design, fabricate and overcheck Quality Assurance requirements pertaining to radioactive

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1.4 (Cont'd)

shipping containers such as: Industrial Engineering - (design), Materials and Structurals Quality Control - (vendor audits), Q.C. Inspection - (overchecks), Radiation Control - (radiation safety), Nuclear Materials Control Accountability - (use), and NMC Nuclear Safety and Licensing, (nuclear safety and licensing compliance criteria). Other sections/departments interface as needs dictate.

2.0 Quality Assurance Program

2.1 Scope

The QA program, as described in this plan applies to nuclear and radiological safety consideration involved with packaging and transport of radioactive material. This program is established and approved by management with future revisions requiring equivalent approval. Implementing procedures and subsequent revisions are also approved in writing by division management. The fact that all requirements of this program are mandatory is communicated to all responsible organizations and individuals. Functional organizations with primary responsibility for implementing and accomplishing this QA program are as follows:

- Nuclear Materials Control is responsible in areas generally involving nuclear or radiological safety evaluations, licensing new or modified containers, (including design coordination and approval in safety related areas), preparation of operational procedures and checklists for container inspection to assure compliance with certificates, and other regulatory criteria as well as overall coordination and resolution of disputes involving quality.

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2.1 (Cont'd)

. Quality Control/Materials Management Section is responsible in areas involving initial and "in-use" container inspection, verification that containers are fabricated in accordance with approved specifications, application of appropriate QC procedures relative to material control/traceability, and vendor QA programs and audits.

As shown in Section 1, both Quality Control and Material Management organizations report independently to the Division Vice President. In addition to the above, shipping containers "in use" may, on occasion, be inspected by other NNFD organizations for routine "in use" inspection (such as Manufacturing). In these cases, the inspection shall be conducted only in accorance with written procedures or checklists approved by Nuclear Materials Control or QC management and the resulting inspection data will be forwarded to NMC for review and retention.

2.2 Requirements

The Quality Assurance program will contain the following elements:

2.2.1 Personnel training, retraining and familiarization with QA, QC and regulatory requirements as defined by management to assure effective control and compliance.

2.2.2 Audits of the QA program to assure continuing compliance with its provisions and intent, *which will also include a review by NMC management to assess its effectiveness and for assurance it is adequate and in compliance with regulations.*

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*Indicates Change

2.2.3 Designation, through procedures, or equally effective means, of the responsibilities for operating the QA program.

2.2.4 Requirements for the approval of procedures, manuals, design specifications, and other documents affecting safety or regulatory compliance.

2.2.5 Identification, based on the specific container involved, of safety *related criteria controlled by the Q.A. Program* includes but is not limited to:

- Structural requirements for maintenance of geometric controls or container integrity.
-*Nuclear Safety
- Radiation *Safety.

2.2.6 Procedures and controls shall be maintained, as appropriate, by vendor or consulting organizations and are applied as intended.

2.2.7 Quality related activities are performed with specified equipment under suitable environmental conditions and prerequisites identified prior to inspection or testing.

3.0 Design Control

3.1 Scope

This section describes the system by means of which effective control is exercised throughout the design of new or modified containers.

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3.2 Responsibility

Responsibility for design control as related to interpretation of regulatory criteria and nuclear/radiological safety is the responsibility of the Manager, Nuclear Materials Control. The Manager, NMC will coordinate all nuclear, radiological, and licensing aspects. In case of disagreement in these areas, the position of the Manager, NMC will prevail.

3.3 Procedure

The design control program will include provision for the following:

3.3.1 Independent verification of nuclear or radiological safety calculations.

3.3.2 Design review and written approval of drawings and specifications prior to release for fabrication, by individuals independent of designs.

3.3.3 The review shall consider the following as appropriate:

3.3.3.1 Adequacy of calculations.

3.3.3.2 Compliance with applicable provisions of the Code of Federal Regulations.

3.3.3.3 Accident evaluations.

3.3.3.4 Inspection, maintenance, and repair criteria.

3.3.3.5 Structural design, construction materials, and purchased parts as related to the maintenance of safety.

3.3.4 Proposed modifications or revisions affecting safety will be reviewed and approved by the Manager, NMC.

3.3.5 A prototype will be tested under design conditions when a new container is proposed for construction. This is not required if a proven design exists.

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3.3 (Cont'd)

3.3.5.1 When proposed design changes may affect safety limitations or controls, design review criteria equivalent to that described above will be implemented.

*3.3.6 A review and verification that applicable regulatory requirements and design bases have been accurately translated into specifications, drawings and procedures.

3.4 The following activities will be documented in writing:

3.4.1 Detailed nuclear and radiological evaluations and acceptance thereof.

3.4.2 Specific safety criteria upon which container design is based.

3.4.3 Results of final design evaluations, identification of "problems", or questionable areas and their resolution.

*3.4.4 Identification of the positions or groups responsible for design review and other design verification activities and their authority and responsibilities.

*3.5 Quality standards that are specified in design documents can not be changed or deviated from without the approval of the NMC Manager.

4.0 Procurement Document Control

4.1 Scope

This section describes the method for controlling and assuring all requirements relative to nuclear/radiological safety and container structural integrity are suitably included or referenced in documents used to procure materials, components, and services. Procedures shall be established to assure that procurement documents are approved by NMC prior to issuance and incorporate applicable 10 CFR part 71 requirements.

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4.2 Requirements

4.2.1 Technical and quality requirements are normally contained in the applicable drawings and specifications. However, technical requirements can be supplemented or defined completely by supplementary documents. Supplementary documents shall not modify design or functional requirements as specified by the applicable drawing or specification.

4.3 Purchasing Procedure

4.3.1 NMC shall prepare a Technical Package for transmittal to the Materials Engineering section for inclusion of appropriate Procurement Control documents and their disposition. The requisition shall denote all of the technical and quality requirements.

4.3.2 The Purchasing Section shall prepare a purchase order for transmittal to an approved vendor from the information contained in the purchase requisition. The purchase order will be checked to verify that the technical and quality requirements in this procurement document are satisfactory. Any changes are subject to the same review and approval as the original documents.

4.3.3 In general, the major purchased materials, components, and services will be procured only from vendors who have been evaluated for acceptability with respect to manufacturing and/or technical capability. Vendor quality assurance programs may or may not be applicable since the shipping containers used by NNFD consist of standard off-shelf items. Procurement documents will contain the right for NNFD to have access to vendors records etc. for inspection and audit purposes.

*4.3.4 Procurment documents will identify the documentation (e.g., drawing, specification, procedures, qualifications, inspections

4.3.4 and test records) to be preprared, maintained and submitted to the purchaser for review and approval. These documents will identify records to be retained, controlled, and maintained by the supplier, and those delivered to the purchaser prior to use or installation of hardware.

5.0 Instructions, Procedures, & Drawings

5.1 Scope

Effective control of fabrication and use of radioactive material shipping containers necessitates the use of approved written procedures and equivalent documentation such as drawings, and specifications. This section provides general criteria for the content and proper use of such procedures and drawings.

5.2 Requirements

5.2.1 Procedures or drawings, as applicable, will be used by the following QA related activities and be approved by QC and other organizations performing QA functions:

5.2.1.1 In-house fabrication of shipping containers or components (if applicable).

5.2.1.2 Qualification testing of containers or components.

5.2.1.3 Inspection and audit of fabrication activities.

5.2.1.4 Audit of shipping container QA program.

5.2.1.5 Routine in-use inspection of shipping containers.

5.2.2 Procedures, instructions, and drawings will contain sufficient information relating to regulatory requirements, specifications, and acceptance criteria to allow complete and effective application by user personnel. Existing systems provide detailed requirements for the content and organization of procedures such that format standardization assures comprehensive coverage, logical sequencing, and appropriate approvals.

6.0 Document Control

6.1 Scope

The control of instructions, procedures, or drawings is the responsibility of the originating unit. This section describes the system whereby such documents which relate to QA, are maintained in a current status (by use of a plan list) and are properly approved and distributed (including available documentation at the work location prior to work commencing).

6.2 Requirements

6.2.1 Prior to issue, design specifications, construction drawings, procurement documents, and design change requests will be approved by the Manager of NMC. Prior to approval, responsible managers will take necessary steps to assure themselves that the document is correct and, if applicable, that proposed revisions do not alter safety criteria.

6.2.2 The shipping container QA plan and revisions thereto will be approved by the Manager Materials Management, Manager NMC and Manager M&SQC.

6.2.3 Operating instructions and procedures will be approved by the Manager of the originating section.

6.2.4 Non-conforming findings are reported to NMC for review. Any non-conforming findings will be dispositioned by consultations with appropriate design or operating personnel. Non-conformance reports and subsequent actions shall be documented. Containers in a non-conformance status will be identified and withheld from use or further fabrication until resolution is obtained.

6.2.5 The section assigned responsibility for preparing a document is also responsible for obtaining the required approvals, controlling the distribution, initiating modifications as required. Assuring that superseded pages are removed from the revised document, is the responsibility of the recipient.

6.2.5.1 The originating section shall be responsible for transmitting to individuals/sections those documents for which they have sole responsibility of maintaining.

6.2.5.2 The section responsible for originating the document is also responsible for assuring that changes to documents have the same reviewing and approval authority as the original issue.

6.2.5.3 Once received, it then becomes the responsibility of the document recipient to distribute the new or revised document and to remove and destroy obsolete documents. (Files wherein outdated documents, specifications, and drawings are retained for historical purposes are exempt from this requirement.)

*6.2.5.4 A master list (Plan list) which identifies the current revision number of instructions, procedures, specifications, drawings, and procurement documents will be established and maintained.

7.0 Control of Purchased Material, Equipment, and Services

7.1 Scope

To assure that purchased material, equipment and services conform to purchase specifications, specific evaluations of vendor capabilities consistent with the importance, complexity, and quantity of the product or services are made by qualified personnel. This is accomplished through vendor evaluations (ability to comply with request and past performance) and inspection of the product received. The results of these reviews are documented and filed.

7.2 Requirements

7.2.1 Prior to procurement of items considered as critical to safety, an evaluation may be made of the vendor's facilities. *This evaluation is based on one or more of the following.*

*7.2.1.1 The supplier's capability to comply with the elements of Appendix E to 10 CFR Part 71 that are applicable to the type of material, equipment, or service being procured.

*7.2.1.2 A review of previous records and performance of suppliers who have provided similar articles of the type being procured.

*7.2.1.3 A survey of the supplier's facilities and QA program to determine his capability to supply a product which meets the design, manufacturing, and quality requirements.

7.2.2 Vendors supplying material, components, or services may be audited during periods of procurement or fabrication activities in accordance with procedures for the purpose of ensuring that quality requirements are being met and maintained. The audits will be conducted in accordance with a planned agenda covering vendor operations such as inspection activities, etc., as specified by the applicable Quality Control Requirement.

7.2.3 As deemed necessary, NNFD may elect to perform inspection at the supplier's plant:

7.2.3.1 Wherever inspection of the vendor's facility before fabrication is commenced is desired.

7.2.3.2 Wherever first-piece inspection at the supplier's facility is desired.

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7.0 (Cont'd)

7.2.3.3 At the discretion of the Manager, NMC, Materials Engineering and Materials & Structural Quality Control.

7.2.4 Incoming materials and components will undergo a receiving inspection prior to release of such items for use. These inspections shall be in accordance with procedures and instructions appropriate to the type of test or inspection applicable to the item. The test results are available prior to release and judgements made to acceptability and proper identification.

7.2.4.1 Concurrent with the receipt inspections, all documentation which the vendor is required to submit (requirements met or not met) shall be reviewed for completeness and for compliance with applicable drawings and specifications.

7.2.4.2 Items which have been determined to comply with the receiving inspection and documentation requirements shall be released for use.

7.2.5 Results of audits and any follow-up activities shall be retained on file.

8.0 Identification and Control of Materials, Parts, and Components

8.1 Scope

This section describes the techniques used to identify the control of radioactive material shipping containers, materials, parts, or components where fabrication is at the NNFD, to provide traceability and to assure that only acceptable parts are utilized in the fabrication of radioactive material shipping containers for the case where specification of these parts or materials is based on safety or licensing requirements.

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8.0 (Cont'd)

8.2 Requirements

8.2.1 Incoming Material, Parts, and Components

8.2.1.1 The NMC Section is responsible for the receipt inspection of all incoming radioactive material shipping containers and material, parts, and components.

8.2.1.2 The results of inspection shall be reviewed along with the vendor certification of physical, chemical, non-destructive testing, and dimensional inspection as specified in the purchase order for compliance with the applicable specifications and drawings.

8.2.1.3 Upon completion of all required inspections and certifiations, NMC shall be advised as to the acceptability of the material or components in question. Non-conforming parts, materials, and components will be handled as described in Section 15 of this plan.

8.3 Traceability

8.3.1 The program used to control and identify material and components is based on unit traceability.

8.3.1.1 All sub-components which are identified with a serial number or other specific identifier shall be subject to unit traceability. *Identification of materials and parts important to the function of safety-related systems and components will be traceable to the appropriate design requirements. The location and method of identifications will be such that it will not affect fit, function or quality of the item being identified.*

*Indicates Change

8.0 (Cont'd)

8.4 Inspection

Completed components are withheld from use until the following actions have been completed:

8.4.1 All inspections have been completed and the results of these inspections have been reviewed for compliance with applicable specifications and drawings.

8.4.2 All documentation has been verified for completeness and accuracy.

8.4.3 Prior to a shipping container's first use, all necessary safety, nuclear and radiological inspections must be completed and documented by the responsible group before being released for use.

8.5 Non-Conforming Conditions

8.5.1 The non-conforming containers shall not be used until:

8.5.1.1 The nonconforming condition or item has been repaired, replaced, or reworked in accordance with approved procedures to restore it to the design specification and/or drawing requirements.

8.5.1.2 The non-conforming condition has been approved by NMC.

9.0 Control of Special Processes

9.1 Scope

This section is not applicable since NNFD uses off-the-shelf material to fabricate shipping containers and no special processes are used.

*9.2 Special processes such as welding, heat treating, nondestructive testing and cleaning will be controlled by written procedures, when applicable.

*9.3 Procedures, equipment, and personnel connected with special process are qualified in accordance with appropriate codes, standards and specifications, when applicable.

9.0 (Cont'd)

*9.4 Qualification records of procedures, equipment and personnel assoicated with special processes will be established, filed and kept current, when applicable.

10.0 Inspection

10.1 Scope

The inspection program is conducted in accordance with standards and documented procedures which incorporate the quality requirements defined in applicable specifications and drawings. The procedures encompass necessary inspections which establish minimum requirements for acceptance on both original and replacement parts, etc. Inspection personnel are independent from individuals performing the activity being interpreted and are kept current as to training and qualification.

10.2 Requirements

10.2.1 Source or Receiving Inspection

All purchased items which effect safety of the final shipping container shall be either source or receipt inspected under an approved B&W procedure. Such inspection shall consist of the following:

10.2.1.1 Review of vendor certification and test reports to ascertain conformance with requirements.

10.2.1.2 Receipt inspection sampling, when needed, shall be in accordance with MIL-STD-105D or an approval alternate plan consistent with the requirements.

10.2.1.3 Any non-conforming components shall be processed per Section 15 of this manual, "Non-conforming Materials, Parts, or Components." Non-conforming components shall not be released until the defective condition is either corrected or the

deviation is accepted in the manner outlined in Section 15.

10.2.1.4 Parts shall also be inspected for proper identification, and other applicable requirements.

10.2.1.5 Following the receipt inspection and satisfactory review of all necessary reports and subsequent verification that the material or parts are acceptable, formal acceptance shall be made as defined in Section 8 of this plan.

10.2.1.6 The NMC Section shall be responsible for decisions affecting B&W acceptance of parts, except in those instances where Section 15 of this plan applies.

10.2.2 Final Inspection

Final inspection shall be performed on completed components prior to use in the following manner:

10.2.2.1 Components shall be inspected in accordance with inspection procedures which assure verification of all specified quality requirements. *Modifications and repairs will be inspected in accordance with the original design and inspection requirements.*

10.2.2.2 All as-built dimensions shall be compiled and forwarded to the cognizant design group as required by specifications.

10.2.2.3 All acceptable components shall be released for further processing upon completion of final inspection.

10.2.2.4 All deviated components shall be treated in accordance with Section 15 of this manual.

*Indicates change

10.0 (Cont'd)

10.2.2.5 All final inspection data shall be maintained and stored as defined in Section 17 of this manual.

10.3 Overinspection

If witness or mandatory hold points are listed in the documents as a condition of release for further fabrication, such points shall be included in the inspection process outline. The cognizant designer or procurement group shall be notified as required to allow the cognizant agency to perform the specified surveillance.

*10.4 Inspector Qualifications

All inspectors will be qualified in accordance with applicable codes, standards, and company training programs.

11.0 Test Control

11.1 Scope

Components manufactured at or for NNFD are inspected for compliance with design specifications and drawings by one or a combination of the following techniques:

11.1.1 Various methods of metrology to verify dimensional requirements.

11.1.2 Verification of mechanical properties and/or chemical requirements to meet material requirements.

11.1.3 Additionally, a program shall be maintained to assure that all testing activities affecting quality and serviceability of nuclear material shipping containers are identified and performed in accordance with approved procedures. These testing activities include but are not necessarily limited to tests which are performed on new shipping container designs which evaluate their specified durability and integrity.

11.2 Requirements

11.2.1 Testing

11.2.1.1 Any prerequisites that are essential for the proper execution of a given test will be outlined in the appropriate procedures. Acceptance criteria shall be incorporated in test procedures for both original and replacement parts, etc.

11.2.1.2 Adequate test instrumentation will be available and used as required in procedures.

11.2.1.3 Tests will be performed under conditions which yield representative test results as stated in procedures and as required by applicable regulations.

11.3 Documentation

Essential testing performed by the designer, fabrication vendor and/or NNFD will be documented and a final evaluation shall be performed by NMC to assure that all test requirements have been satisfied.

12.0 Control of Measuring and Test Equipment

12.1 Scope

This section sets forth measures in effect to assure that all measuring and test equipment used in activities affecting quality and safety are properly controlled, calibrated and adjusted to maintain accuracy within required limits. It is the responsibility of responsible sections and NMC to assure that proper procedures are followed for active gages, measuring devices, and inspection fixtures under their respective control.

12.2 Requirements - Quality Control Equipment

12.2.1 New or Reworked Equipment

12.2.1.1 When applicable, inspection equipment used for quality verification shall be initially calibrated against available known standards traceable to the National Bureau of Standards.

12.2.1.2 Inspection equipment for which standards traceable to the National Bureau of Standards are not available will utilize manufacturer's certificate of accuracy.

12.3 Storage of Equipment

12.3.1 When equipment must remain permanently in work area, adequate means for its protection and cleanliness will be provided within the limits of work requirements.

12.3.2 Any gage to be repaired will be removed from service and controlled until repair and recalibration has been complete.

12.4 Periodic Inspection of Equipment

12.4.1 All inspection gages shall be examined, calibrated, and/or serviced at scheduled intervals specified in applicable procedures by personnel who are specifically charged with the responsibility of maintaining accurate gage and related records. *All measuring and test equipment is identified and traceable to calibration test data.*

12.4.2 Additional gage inspection shall be made when there is evidence of excessive wear, suspected, or actual instrument damage.

12.4.3 The inspector, when using relativ ly simple gages such as micrometers, which can be readily checked for accuracy, shall check them with known standards during the usage of such gages.

12.4.4 Any gage or equipment utilized in the inspection process which exceeds the established calibration accuracy limits shall be subject to the following action:

(a) Removal from service and stored in an appropriate detention area.

(b) Determine disposition of the gage, i.e., rework, recalibrate or scrap and replace.

(c) Reworked gages shall be recalibrated prior to return to service.

12.4.4.1 All components measured with a gage or equipment that had exceeded the established calibration accuracy limits shall be reinspected with correctly calibrated equipment.

12.5 Requirements - Radiation Monitoring Equipment

12.5.1 Radiation Survey and Analysis Equipment

Equipment falling into this category shall be calibrated and maintained as specified by SNM-42.

13.0 Handling, Storage, and Shipping

13.1 Scope

This section sets forth measures for preventing damage or deterioration during packaging, shipping, and storage of shipping containers. It is the responsibility of all operating sections to follow procedures which will establish the methods and techniques which are to be followed to prevent damage. Specifically, NMC shall verify that the shipping containers and associated parts are adequately protected in accordance with procedures listed below.

13.2 Requirements

General

13.2.1 All assembly operations shall be carried out in an area which permits the attainment of the appropriate cleanliness standards.

13.2.2 Prior to each use, shipping containers are inspected for compliance with applicable regulatory controls including certificates of compliance and the Code of Federal Regulations.

13.2.3 Movement of a package/container will be accounted for to a degree consistent with the safe transportation of the package/container. All applicable shipping papers will be completed as required.

14.0 Inspection, Test, and Operating Status

14.1 Scope

This section sets forth measures for ascertaining the status of inspections and tests performed on shipping containers.

14.2 Requirements

The status of inspection operations for components which are to be supplied to or used shall be documented in the following manner:

14.2.1 New Container Inspection

14.2.1.1 Receiving inspection on incoming containers shall be performed in accordance with approved procedures. If these items are found to be acceptable, appropriate documentation shall be generated to indicate acceptability.

14.2.1.2 Any items determined to be non-conforming shall have a "Hold" tag attached to the item. If the assessment of the non-conforming condition establishes that rework is permissible, a "Rework Required" tag shall be attached to the item.

14.2.1.3 Any item deemed to be unacceptable and not subject to rework or repair shall have a "Reject" tag attached to it and shall be segregated from conforming units to await final disposition.

14.2.2 Final Inspection

14.2.2.1 Containers which have completed the final inspection operation shall have an "Inspection Complete" tag attached by the Inspection Group. This tag will indicate that all inspection operations are complete. The tag may be removed when container is placed in service. If rework is necessary, a "Rework Required" tag shall be attached.

14.2.2.2 Under no circumstances shall a non-conforming part or container which has been processed through final inspection be used until the discrepant condition has been corrected.

*14.2.2.3 All required inspections, tests and other critical operations shall be performed unless otherwise approved by NMC Management.

14.2.3 In-Use Inspection

14.2.3.1 In-use inspection shall be performed under the auspices of NMC in accordance with approved procedures.

14.2.3.2 Any item or component found to be non-conforming during in-use inspection shall have a "Hold" tag attached to it indicating a deviation which may require a repair, rework, reject, or use as is dispositioned.

14.2.3.2.1 If rework is required, a "Rework Required" tag shall be attached.

14.0 (Cont'd)

14.2.3 (Cont'd)

14.2.3.2 (Cont'd)

14.2.3.2.2 Any component classified as reject shall have a "Reject" tag attached to it and shall be processed per paragraph 14.2.1.3.

15.0 Non-Conforming Materials, Parts, or Components

15.1 Scope

This section sets forth the measures taken to control shipping containers or parts which do not conform to requirements to prevent subsequent use until the non-conforming condition is corrected. It is the responsibility of NMC to assure that the following requirements are fulfilled on non-conforming units.

15.2 Requirements

General

15.2.1 All non-conforming parts/containers shall be documented.

15.2.2 All non-conforming components shall be separated from conforming components and identified (tagged, marked) as being non-conforming.

15.2.3 Sufficient data shall accompany the non-conforming part/container to identify the non-conforming condition. (Such data is not required for any part or container which will be scrapped.)

15.2.4 NMC shall recommend the disposition of the non-conforming parts/containers.

15.3 Disposition of Non-Conforming parts

15.3.1 Items which are identified to be non-conforming at receiving or "in use" shall be properly documented as such.

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15.0 (Cont'd)

15.3 (Cont'd)

15.3.2 NMC shall review the completed documentation and recommend disposition. *This documentation shall describe the non-conformance, the disposition and the inspection requirements and shall include signature approval of the disposition.*

15.4 Repair of Non-Conforming Components

15.4.1 After the repair has been completed, the component shall be inspected for conformance to the original applicable design criteria. *Acceptability of rework of materials parts, components and systems will be verified by reinspecting and retesting the item as originally inspected and tested or by a method which is at least equal to the original inspection and testing method.*

15.5 Reject or Non-Conforming Components

15.5.1 Material and components which have been rejected shall be tagged and placed on hold.

16.0 Corrective Action

16.1 Scope

This section sets forth measures for assuring conditions adverse to quality in safety related areas such as defective material, non-conformances to design specifications and drawings, deficiencies, and non-compliance with approved procedures are promptly identified and corrected. It shall be the responsibility of the NMC Section to bring to the attention of management any condition adverse to quality and to verify that appropriate corrective actions have been taken to preclude its repetition.

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*Indicates Change

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16.0 (Cont'd)

16.2 Requirements

Review of Non-Conforming Conditions

16.2.1 A review of non-conforming conditions shall be conducted periodically.

16.2.2 The purpose of this review shall be to analyze the deviated conditions for chronic recurrence, determination of cause, and to recommend the corrective action to be implemented. Also, previously identified corrective actions will be followed up to ascertain the status and effectiveness of the measures taken.

16.2.3 NMC shall be responsible for documenting the results along with the corrective action taken on each identified item. Also, included shall be the follow-up performed on previously identified corrective actions.

16.2.4 The Manager, NMC shall review the results.

16.3 Operational Reviews

16.3.1 Findings shall be brought to the immediate attention of management to:

16.3.2.1 Determine if use of the container should be terminated.

16.3.2.2 Assess the risk involved with continued use.

16.3.2.3 Establish appropriate corrective actions and means for implementation.

17.0 Quality Assurance Records

17.1 Scope

This section sets forth measures for the preparing and maintaining Quality Assurance records. It is the responsibility of the NMC Section to assure that adequate tests and inspection records are maintained for verifying compliance with the provisions of this QA program.

17.0 (Cont'd)

17.2 Requirements

17.2.1 Inspection forms, test report, and other pertinent records shall be completed by personnel assigned the responsibility to perform such inspections and tests.

17.2.2 Inspection forms, test reports, and records shall indicate any deviation from requirements of Section 15 of this manual.

17.2.3 NNFD shall retain Quality Assurance records, *which shall be identifiable and retrievable,* from a container's first use shipment to its removal from use as a minimum. After this period, the necessity for longer storage of these records shall be reviewed. Final disposition of these records shall be contingent on management concurrence that they are no longer required.

*17.2.4 Quality Assurance records shall include operating logs; results of reviews, inspections, test, audits and material analyses; qualification of personnel, procedures, and equipment; other documentation such as drawings, specifications, procurement documents, calibration procedures and reports, nonconformance reports; and corrective actions. A list of all required records and their storage locations will be maintained.

*17.2.5 Inspection and test records shall contain the following, where applicable.

(1) A description of the type of observation.

(2) Evidence of completing and verifying a manufacturing, inspection, or test operation.

17.0 (Cont'd)

17.2 (Cont'd)

*17.2.5 (Cont'd)

(3) The date and results of the inspection or test.

(4) Information related to conditions adverse to quality.

(5) Inspector or data recorder identification.

(6) Evidence as to the acceptability of the results.

18.0 Audits

18.1 Scope

This section sets forth audit programs, both internal and supplier. Internal audits will be performed to verify compliance with the Quality Assurance Program and to determine the overall effectiveness of the program. Supplier audits may be performed to monitor quality programs in effect at vendor facility while they are supplying material or components to current purchase orders (depending upon need.) The audits will be conducted by personnel who have experience or training in auditing and will use a checklist and/or other appropriate audit forms. NMC has responsibility to assure proper administration of the audit program as outlined below.

18.2 Requirements

18.2.1 Audits are performed in accordance with pre-established written procedures or check lists and conducted by personnel not having direct responsibilities in the area being audited.

18.2.2 Audit results are documented and then reviewed with management having responsibility in the area audited. Necessary action is then taken to correct the deficiencies.

18.2.3 Re-audits are routinely scheduled to verify implementation of corrective actions which minimize recurrence of deficiencies.

18.2.4 Audits are performed at least annually on safety significance of the activity being audited.

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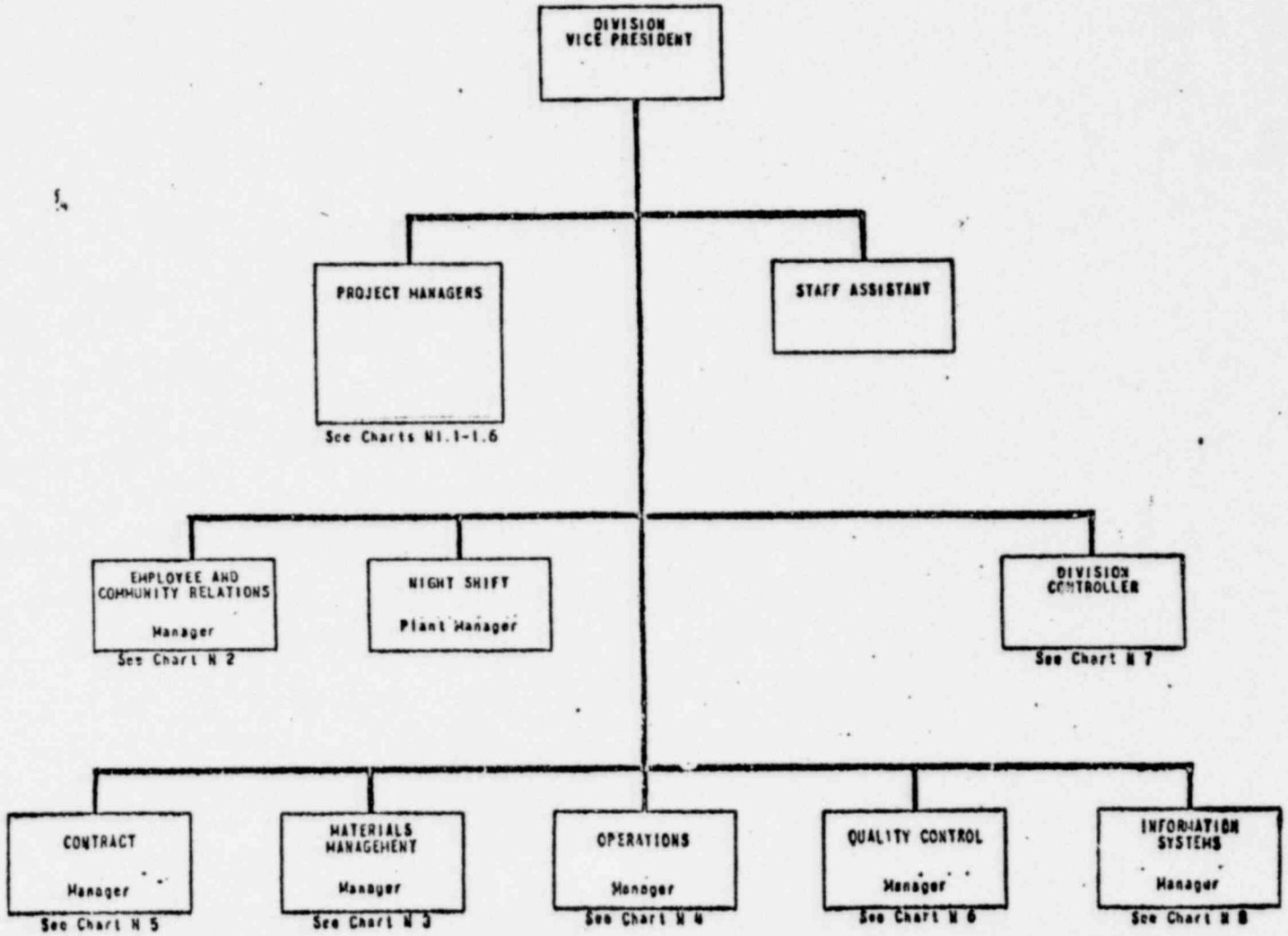
NAVAL NUCLEAR FUEL DIVISION



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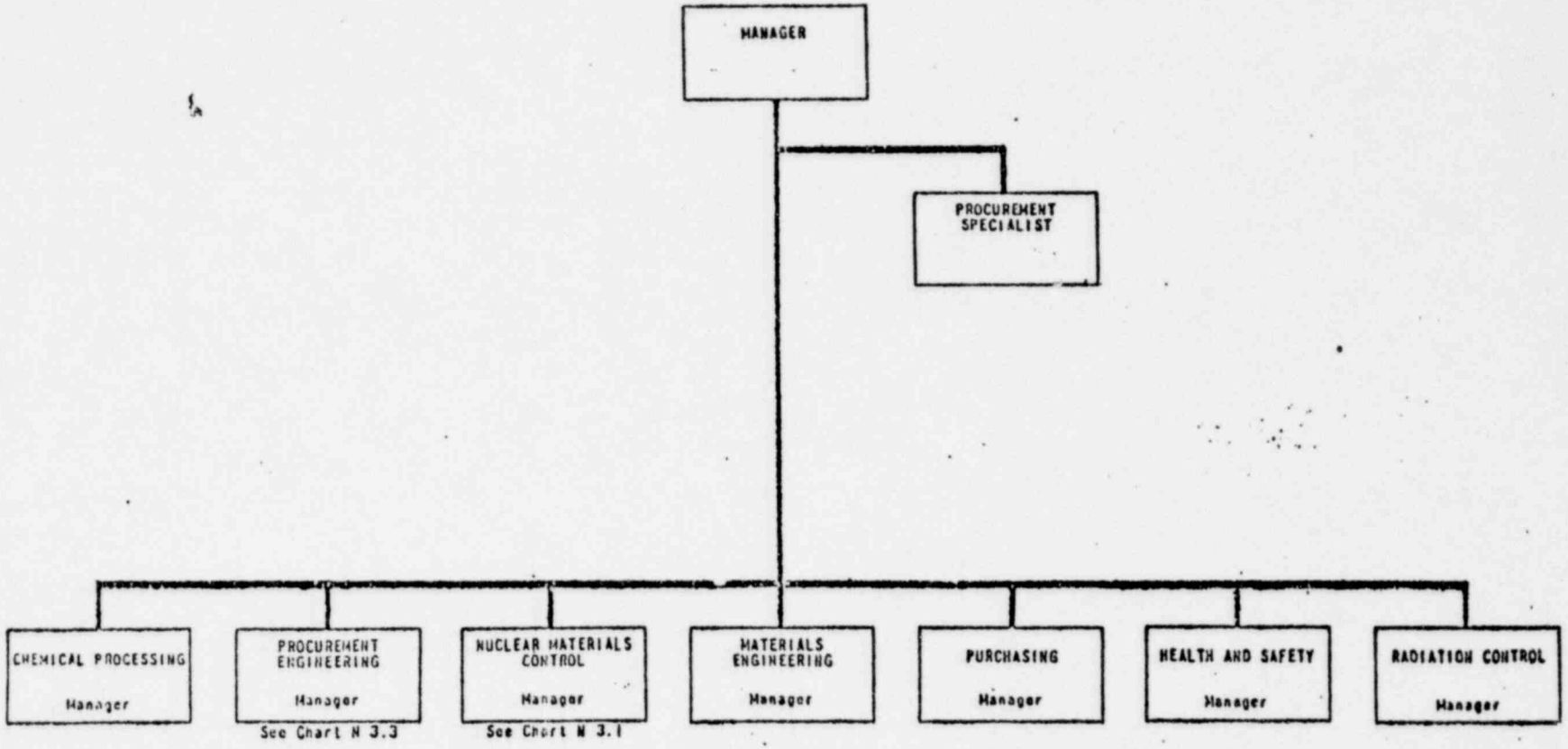
Appendix A

This chart and the detail charts referred to are prepared and maintained by Office Management Department, N.Y.

5-1-78
ORGANIZATION CHART NO. N 1
THE BABCOCK & WILCOX COMPANY

NAVAL NUCLEAR FUEL DIVISION
MATERIALS MANAGEMENT DEPARTMENT



This chart is prepared and maintained by Office Management Department, N.Y. Detail charts referred to are maintained by Employee Relations, Naval Nuclear Fuel Division, Lynchburg.

7-1-78

ORGANIZATION CHART NO. N 3
THE BABCOCK & WILCOX COMPANY