## 3.5 Design Verification

The adequacy of product designs may be verified in several ways, including inreactor experience of similiar design, performance of design reviews, alternate calculations, or design testing. The depth of design reviews and verifications depend upon the complexity and end use of the item. The individuals responsible for performing design verification activities should include persons other than those who performed the original design. Use of the designer engineer's subsection manager for design verification is restricted to special situations where the subsection manager is the only individual within the design organization competent to perform the verification. Design verification activities are performed in accordance with design quality assurance procedures.

### 3.5.1 Design Reviews

Reviews of fuel designs and related documentation are performed to determine adequacy of the design, to assure that design parameters can be controlled during manufacture, and that design features can be inspected and tested and that inspection and test criteria are identified. Approval of the design is signified by signature on the applicable design documents.

Additionally for new designs or significant changes to previous designs, a final design review is conducted by the authorities identified in Appendix I prior to the initiation of fuel fabrication. (3)

### 3.5.2 Alternate Calculations

Verification of some types of calculations or analyses may be achieved by comparison with alternate methods of calculation or analyses. When performed, these alternate calculations are performed by persons other than those who performed the original calculation and serve to verify the correctness of the original calculation. Alternate calculations may employ a more simplified approach or be less rigorous and the results may not exactly check with the original calculation, however they must provide results consistent with the original calculation or analyses. The alternate calculation will also address the appropriateness of assumptions, input data, and the code or other calculation used.

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### 3.5.3 Design Testing

Test programs utilized to verify design adequacy are conducted under design conditions sufficient to demonstrate that the item will withstand in-service use. Design tests are approved and controlled in accordance with design control quality assurance procedures. Existing data from tests of previous designs may be valid for current designs provided the designs are adequately similar. In such cases new testing may not be required.

## 4.0 Procurement Document Control

Procedural controls are established to assure that applicable regulatory requirements, design bases, fabrication requirements, and other requirements are included or referenced in procurement documents for material, equipment, and services.

## 4.1 Purchase Specifications

Design requirements set forth in approved Product Specifications, Material Specifications, and drawings are transferred into Purchase Specifications by Materials and Purchasing. Additionally, the Purchase Specifications must be technically compatible with approved Quality Control Standards, Process Specifications, and Quality Assurance requirements. Purchase Specifications are prepared and approved as indicated in Appendix I. Acceptance by the Manager, Quality Control is intended to assure that quality requirements are adequate, correctly stated, and are controllable. △3

## 4.2 Content of Purchase Specifications

Purchase Specifications for the purchase of material, equipment, and services include or reference the following provisions as applicable:

a) A statement of work to be performed;

b) Technical requirements regarding specific drawings, specifications, codes, regulations, procedures, or instructions including test and inspection requirements and special process instructions;

c) Quality assurance program requirements, including applicable requirements of 10 CFR 50, Appendix B;

d) Submittal of Vendor's Quality Assurance Program (manual) and access to the vendor's QA/QC procedures;

e) Standard clauses for access to their plant and records, performance of source inspection, and auditing their QA system and those of their subvendors;

f) Identification of documentation required to be submitted, including quality assurance records, for information, review, or approval of the purchaser;

g) Retention and disposition requirements of quality assurance records not delivered to the purchaser;

h) Submittal of Process Outline and QC Inspection Plan to the Purchaser, including process hold points;

5.2 Product Definition

5.2.1 Design Criteria combine contract, regulatory, and Exxon Nuclear imposed requirements which unite technical, material choice, economic, Quality Assurance, and compatibility factors, and serve as the basis for product design.

5.2.2 Design Reports provide the final expression of the design combining relevant factors such as contract requirements, reactor compatibility, Design Criteria, product life and warranties, applicable codes and standards, choice of materials, reactor safety and licensability, inspectability, and product quality. 3

5.2.3 Material Specifications, Product Specifications and Drawings identify the "end function" requirements for product components and final product. They serve as the basis for Purchase Specifications, Process Specifications, and Quality Control Standards and must meet the requirements of the Design Criteria. The Product and Material Specifications establish limiting physical and chemical properties of materials and related products. The Parts List identifies the specific Product and Material Specifications and drawings applicable to a particular reload and thus constitutes the authoritative definition of the product. Product Specifications include the required characteristics and the standards or tolerances applicable to each part and a classification of characteristics as to importance. This "importance" statement (critical, major, or minor) establishes the basis for inspection and testing requirements.

5.3 Process Definition

5.3.1 Process Specifications establish the step-by-step requirements for manufacturing the product and also provide an indirect means of specifying product quality. Conformance to Process Specifications is also indirect evidence of conformance to Product Specifications.

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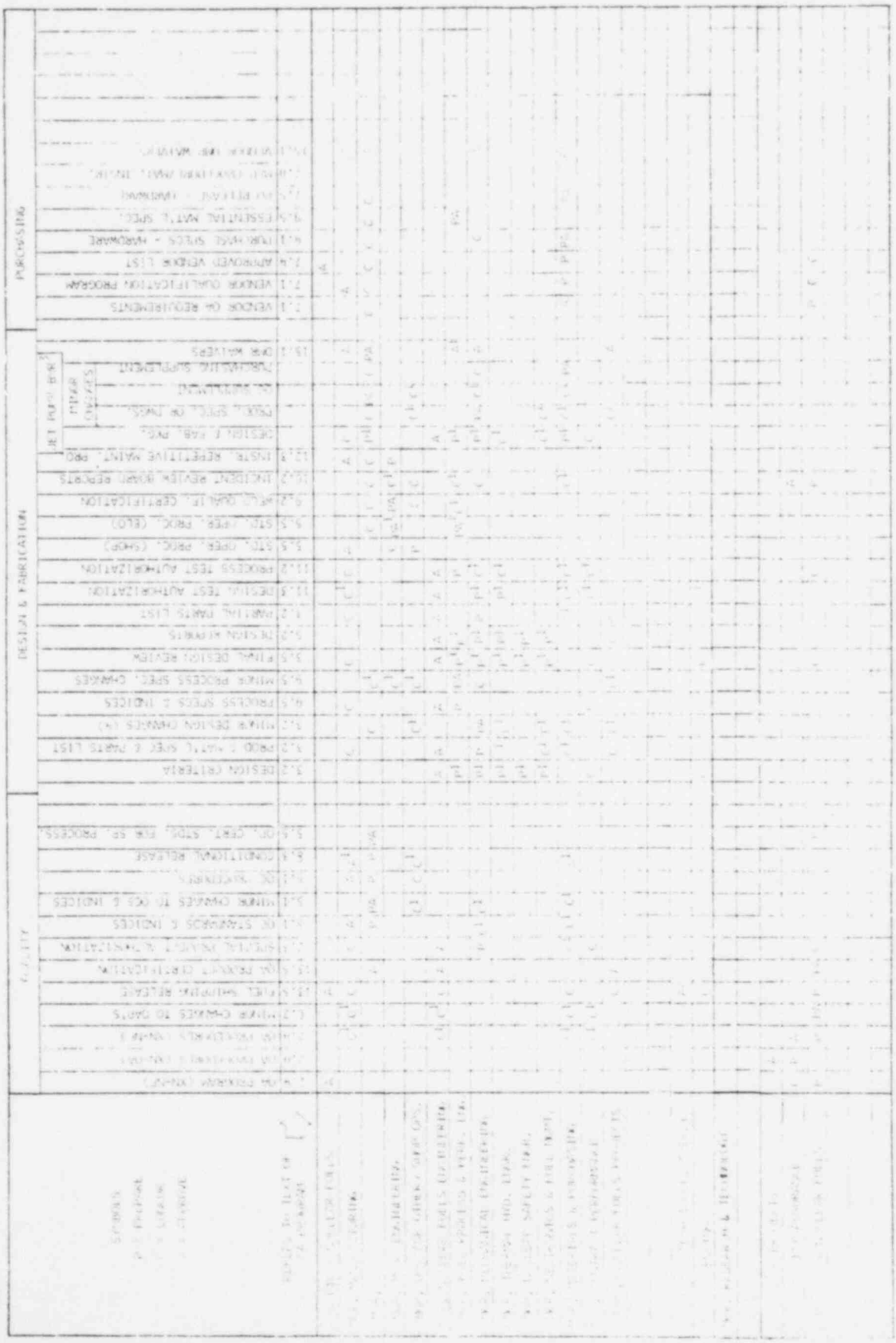
MATRIX OF ACCOUNTABILITY AND RESPONSIBILITY – NUCLEAR FUELS

EXXON NUCLEAR COMPANY, Inc.



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