

Sequoyah Nuclear Plant

ADMINISTRATIVE INSTRUCTION
AI-36

STORAGE, HANDLING AND SHIPPING
OF QA MATERIAL

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- 1U Plant Manager, WBNP
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- 1U Manager, OQA, 401 UBB-C
- 1C Chief, Nuc Safety Staff
220, 401B-C
- 1U NEB, W10C74C-K
- 1C NSRS, 250 HBB-K
- 1U Project Mgr, QCRU SQN CONS
- 1U MEU, SQN CONST
- 1U INPO, Lu Yarger, Manager
Eval. Support Dept.
1100 Circle 75 Pkwy, Suite 1500
- 1C Power Stores (Mod)

Concurrence: *John Hamilton*
FQE Staff

Prepared By: C.R. Stutz

Revised By: C.R. Stutz

Submitted By: James E. Law
Supervisor

PORC Review: MAR 21 1984
Date

Approved By: *S.M. Hobles*
Pwr Plant Superintendent

Data Approved: MAR 21 1984

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PDR ADOCK 05000327
G PDR

The current revision level of this instruction is 3 :
Reason for current revision (include all temporary change numbers) Revised in
accordance with Temporary Change No. 84-0219, PORC approved 2/15/84.

The last page of this instruction is Number 63.

1.0 PURPOSE

- 1.1 This instruction defines the storage requirements and recommended practices for safety-related material and equipment (CSSC) in order to ensure that the quality of items is not degraded as a result of improper storage. It also should act as a guide for achieving good storage for the balance of inventory.
- 1.2 This instruction establishes the requirements for the Power Stores Section for handling and shipping of the critical structures, systems, and components (CSSC).
- 1.3 Also, this instruction establishes the requirements for controlled access to power storerooms.

2.0 SCOPE

- 2.1 The requirements of this administrative instruction, AI-36 are applicable to the Power Stores Unit and the Power Stores Modification Unit. The term "Power Stores" or "Power Stores Section" shall include the Power Stores Unit and the Power Stores Modification Unit.
- 2.2 The requirements of this procedure apply to material purchased by EN DES or NUC PR for modifications (i.e., ECN material) as well as material purchased by NUC PR to operate and maintain the plant.
- 2.3 These requirements apply to CSSC materials to be stored from the time of receipt to the time of issue and, additionally, to the time of use if lengthy storage is required in plant areas.
- 2.4 This procedure satisfies the requirements of ANSI/ASME N45.2.2 - 1978, Part 5, Storage.

3.0 REFERENCES

- 3.1 Sequoyah Nuclear Plant - Request for Waiver - DPM No. N82A17 - ARMS L23 830810 879.
- 3.2 Sequoyah Nuclear Plant - Request for Wavier - DPM No. N82A17 - ARMS L53 830601 850.
- 3.3 N-OQAM, Part II, Section 1.2
- 3.4 N-OQM, Part III, Section 2.2 and 7.1.

- 3.5 DPM No. N82A17, Equipment and Material Storage Requirements for Nuclear Power Stores.
- 3.6 SQA45 Quality Control of Materials and Spare Parts
- 3.7 SQA134, CSSC List
- 3.8 AI-11, Receipt Inspection, Nonconforming Items, Substitutions, and QA Level/Description Changes
- 3.9 DPM No. N73M2, 4.M.1.1(h) Process Specification (Stainless Steel).

4.0 RESPONSIBILITIES

The Power Stores supervisor shall be responsible for adherence to these storage requirements.

The responsibility for temporary storage, if required after issue from Power Stores, shall be that of the supervisor to which the material was issued.

Special OUT-OF-STORES testing of items shall be the responsibility of the cognizant maintenance supervisor.

5.0 STORAGE REQUIREMENTS

5.1 Introduction

The preservation of material during storage consists primarily of keeping the material clean and dry and protecting it from physical damage.

5.1.1 This instruction provides minimum storage requirements. When necessary, additional requirements from other sources, such as manufacturer's recommended practices, shall be assessed and, as applicable, implemented by the procedure described in Section 5.11.1.

5.1.2 This instruction also describes desirable recommended practices or methods for complying with requirements. This information is not a requirement and is clearly designated "recommended practice"

5.1.3 Section 5.11.5, Storage Instruction, provides the specific requirements for an item, including acceptable storage area, special environment, preparation, packaging, physical storage conditions, and periodic inspections, tests, and maintenance. Equipment and material not specifically addressed under one of the categories of Section 5.11.5, shall be stored according to the general guidelines and practices of this instruction.

- 5.2 Post-Fire Evaluation--In the event of a fire should occur in the storage area, each item known to have been heated to an ambient temperature of over 150°F or subjected to smoke contamination shall be withheld from installation or use until it has been thoroughly examined and the item has been verified to be in conformance with specified requirements.
- 5.3 Insect, Rodent, and Animal Control--Prior to placing materials, components, and spare parts in storage, packages and crates shall be inspected for insect, rodent, and animal infestation. Care should be exercised to prevent the entrance of rodents, insects, or other animals into storage areas or equipment to minimize possible contamination and mechanical damage to stored materials.
- 5.4 Storage Methods--Storage methods shall comply with the following requirements.
- a. Ready Access to Stored Items--All items shall be stored in such a manner as to permit ready access for inspection or maintenance without excessive handling to minimize risk of damage.
 - b. Storage of Hazardous Material--Hazardous chemical, paints, solvents, and other materials of a like nature shall be stored in well-ventilated areas which are not in close proximity to important nuclear plant items.
 - c. Coverings--Weatherproof covering, when used for long-term outdoor storage, shall be a flame-resistant type of sheeting of tarpaulins. They shall be placed so as to provide drainage and to ensure air circulation to minimize condensation. They shall be tied down to prevent moisture from entering laps and to protect the coverings from wind damage.
- 5.5 Storage Outside the Permanent Storage Facility--Items which are not sensitive to environmental conditions may be stored in temporary storage facilities such as Butlet buildings or similar facility or outdoors. Outdoor storage areas shall be marked and designated for storage, well drained, and gravel covered or paved. Items stored outdoors shall be placed on cribbing or equivalent to allow air circulation and to avoid trapping water.
- 5.6 Facility and Storage Area Requirements

Items can be stored in either of three types of storage areas designated as Indoor Controlled, Indoor, or Outdoor. Indoor Controlled corresponds to ANSI levels A and B storage. Level A items may require additional special protection as specified in Section 5.11 of this instruction. Indoor corresponds to ANSI Level C. Outdoor corresponds to ANSI Level D. The environmental and physical requirements for these areas are as follows:

5.6.1 Indoor Controlled

Sequoyah Nuclear Plant's Class A and B storage facilities will be in compliance with these requirements within six months after our new Power Stores Warehouse is completed.

- 5.6.1.1 The facility shall be constructed so as to be non-combustible, weathertight, and not subject to flooding. The floor shall be paved or equal, and well drained with no standing water.
- 5.6.1.2 Temperature shall be maintained between 40°F and 120°F with the rate of temperature change controlled to prevent condensation.
- 5.6.1.3 Outside air pulled in by ventilating fans shall be dust filtered or determined to be free from excess dust caused by outside activity. Dust control measures shall be taken when work and cleaning activities create or raise large amounts of dust. This requirement is waived until after the move to the new stores facility. Until moving into the new Power Stores, items susceptible to dust damage shall be given special protection (e.g., wrapping in plastic).
- 5.6.1.4 The air shall be maintained above the dewpoint. Humidity and condensation conditions shall be minimized by any or a combination of the following:
 - Avoid abrupt changes in temperature.
 - Avoid pulling heavily moisture-laden air.
 - Heat.
 - Air circulation.
- 5.6.1.5 No chemical or bulk materials which are packaged so they can exude dust or fumes shall be stored or handled in this area.
- 5.6.1.6 Refer to Section 8.0 for access control requirements.
- 5.6.1.7 Rodents and other animals shall be controlled by examining packages at receiving inspection and by documented monthly surveys of the storage area by the Power Stores receipt inspectors. If these surveys indicate rodent infestation, an eradication program shall be implemented expeditiously.

- 5.6.1.8 The storage area shall be cleaned and maintained as required to avoid the accumulation of trash, discarded packaging materials, and other detrimental soil in accordance with the requirements of SQA66.
- 5.6.1.9 Food and drink may not be used or stored in storage facilities (Power Stores) except in designated areas shown in Attachment 7. Food and drink may be used or stored only in the main office and the craft waiting office of the Power Stores Modification Unit (see Attachment 8).
- 5.6.1.10 Fire protection for the storage area shall be in accordance with the Fire Protection Manual, Program Area 19 (which incorporates DPM N82FP1, Fire Protection Manual).
- 5.6.1.11 Recommended practice: Light bulbs under cover and electrical space heaters directed at particular equipment to reduce humidity are not recommended because of their chances of failure and subjecting equipment to adverse conditions.

5.6.2 Indoor

Same as indoor-controlled except for temperature and humidity as described in items 5.6.1.2 and .4.

- 5.6.2.1 Temperature shall not exceed 140°F. There is no minimum requirement.
- 5.6.2.2 Condensation condition shall be controlled to prevent long-term exposure of items to heavy moisture. If deemed necessary, area heating, ventilation and/or inside air circulation shall be used to reduce the possibility of reaching dewpoint conditions and to evaporate any collected moisture.

5.6.3 Outdoor

- 5.6.3.1 Outside storage shall be in an area designated for storage. Refer to Section 8.0 for access control requirements.
- 5.6.3.2 Items shall be stored on pallets, cribbing, racks or equivalent to keep dry and allow for air circulation.
- 5.6.3.3 Open sheds and/or covers may provide weather protection as required.
- 5.6.3.4 Covers when required shall be secure and arranged in a manner which will avoid trapping water.
- 5.6.3.5 Items stored outdoors shall be positioned or covered to avoid trapping of moisture in pockets or internally (containers excluded).

5.6.4 In-Plant Storage

In-plant storage is the storage of material after issue from the storeroom, usually at or near its final installed location while it is being installed and/or readied for operation. Because of the surrounding conditions, it is during these storage periods that the material is often least protected. Careful planning is required to ensure that the material is adequately protected from dust, dirt, moisture, physical damage, or harmful vapors. It is the responsibility of the withdrawing supervisor to ensure that material is adequately stored during this period.

5.7 Packaging and Physical Storage Conditions

- 5.7.1 The Power Stores Section shall determine the adequacy of and provide packaging of materials, components, and spare parts for storage. Storage conditions shall be adequate to minimize the possibility of damage or lowering of quality due to corrosion, contamination, damage or lowering of quality due to corrosion, contamination, deterioration, or physical damage while an item is in storage.

5.7.1 Continued

As a minimum the following shall be considered:

- a. Caps and plugs shall be used to seal openings in items having sensitive internal surfaces and to protect threads and weld preparations.

Covers removed for internal access at any time for any reason shall be immediately replaced and resealed after completion of the purpose for removal.
- b. Temporary preservatives shall be left intact during storage. Should reapplication of preservatives be required at the site, only those previously approved shall be used.
- c. Items pressurized with inert gas shall be monitored at such a frequency as to ensure that the gas pressure is maintained within specified limits during storage. Desiccant humidity indicators shall also be monitored and desiccants shall be changed or reprocessed when specified.
- d. Instrumentation racks shall be energized as specified by the manufacturer.
- e. Space heaters enclosed in electrical items shall be energized as specified as the manufacturer.
- f. Desiccants shall be regenerated or replaced as necessary in accordance with the manufacturer's suggestions or special plant instructions.
- g. Other maintenance requirements specified by the manufacturer's instruction for the item shall be performed.
- h. Power Stores personnel shall identify all safety-related items that require a special protective environment or care during storage to prevent deterioration. Technical assistance shall be provided by the originator of the purchase request or his representative, if required.

Special requirements for protective environment or care during storage shall be documented on AI-11, Attachment 1 (items V and VI) as applicable. The Power Stores Section shall be responsible for implementing these requirements.

5.7.1 Continued

Storage considerations for these special items include:

1. More restrictive temperature and humidity control.
2. Ventilation system requirements providing an atmosphere free of dust and harmful vapors.
3. Any other appropriate requirements.

5.7.2 Special packaging requirements for storage of unique or special items not addressed in Section 5.11 of this instruction shall be designated by the cognizant engineer. On notification of receipt of such items by Power Stores, it is the responsibility of the plant cognizant engineer to evaluate the acceptability of the packaging or specify the need for repackaging. Such special requirements for protective environment or care during storage shall be documented as described in Section 5.11.1.

5.7.3 General Packaging and Storage Practices

- 5.7.3.1 Electronic components and modules, electrical control equipment, and machined mating or bearing surfaces are most subject to damage and shall be packaged and stored with concern for their susceptibility to damage. Typical concerns are accidental impact, bending, and constant vibration.
- 5.7.3.2 Factory applied preservatives, desiccants not included, shall be left intact during storage. Should reapplication of preservatives be required at the site, only those previously approved shall be used.

5.7.3 General Packaging and Storage Practices (Continued)

- 5.7.3.3 Products used in the storage/preservation of reactor coolant boundary material shall meet the requirements of SQA45, Part III, DPM N73E1, Specification Standards of Material Commonly Associated with Maintenance Which May Come in Contact with Reactor Coolant.
- 5.7.3.4 Items stored on the floor shall be stored on pallets, cribbing, shoring, or equivalent in order to permit air circulation and prevent trapping moisture.
- 5.7.3.5 Corrosion resulting from unprotected or unpainted bare metal surfaces coming in direct contact with pallets, cribbing, or blocking material is not acceptable. When such corrosion could occur (e.g. when wood is green or wet) protective material such as plastic sheeting shall be placed between the item and the wood.
- 5.7.3.6 Items stacked for storage shall be arranged so that racks, cribbing, or crates are bearing the full weight without distortion of the item. Materials or equipment shall not be leaned, propped, or stacked in unstable configurations.

5.7.4 Austenitic Stainless Steel Material

- 5.7.4.1 Austenitic stainless steel and nickel base alloys shall be stored and handled so they are not in contact with dissimilar metals, such as carbon steel, lead, copper, zinc, mercury, etc., or in contact with halogenated materials, such as refrigerant, propellants, etc.

Material (such as Viton, Neoprene, and Saran) compounded from chemical compounds containing chlorides or fluorides which contact surfaces are prohibited.

Lead, or material containing lead as a basic chemical constituent, shall not be used in direct contact with the surfaces of material.

- 5.7.4.2 Carbon steel fixtures, slings, or handling rigs shall not contact stainless steel components for safety-related systems.

5.7.4 Austenitic Stainless Steel Material (Continued)

5.7.4.3 Stainless steel material stored outdoors shall be stored under cover with protection from the elements.

NOTE: This requirement is temporarily waived pending completion of new storage facilities;

Reference: L23 830810 879

5.8 Identification and Marking

5.8.1 Identification for Storage

5.8.1.1 The Power Stores Section shall establish an identification system whereby the association between any CSSC material, component, or spare part and its quality assurance documentation is maintained. As a minimum, this system shall include the MAMS TVA Item Identification Code (TIIC); the receipt date (for QA Level I and II items); and applicable manufacturer's heat, lot, or individual serial number. All items or their containers shall be plainly marked in a manner which is not deleterious to the item and so that they are easily identified without excessive handling or unnecessary opening of crates and boxes. Additional specific marking requirements are delineated in AI-11, Attachment 3.

5.8.1.2 Power Stores will maintain positive identification between the TIIC and CSSC materials, components, or spare parts and its quality assurance documentation. For QA Level I and II items, the TIIC Identification Sticker shall be attached to the material, component, or spare part and will indicate the TIIC, the receipt date for QA Level I and II items, the TVA contract number or procuring document number, the item number, and the applicable manufacturer's heat, lot, or individual serial number.

5.8.1 Identification for Storage (Continued)

5.8.1.3 Identification and segregation methods shall be maintained for storage of items assigned Level I or II quality assurance surveillance by using Quality Stores Ledger Cards (Form TVA 6124B) and Bin Description Cards (Form TVA 6509A) to denote that quality assurance requirements and assignments have been made for that item. Bin Description cards will be used to denote that requirements and assignments as required by the Quality Assurance Program have been made. The TIIC number shall be indicated on the Bin Description cards. The Red Bin Description cards, TVA Form 6509A, shall be used to denote QA Level I and II items. The yellow or buff Bin Description cards, TVA Form 6509, shall be used to denote QA Level III, IV and No QA items. Physical mixing of items identified by the use of the "red" bin tag with items not purchased per the requirements of SQA45, is prohibited.

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5.8.1.4 One copy of form TVA 6523-9, Request to Stock New Items, is placed in storage bin to serve as the temporary bin tag until the TIIC number is assigned and the form 6509A or 6509 is typed and placed in the bin or location for the new stock item. At that time, form 6523-9 may be removed and destroyed.

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5.8.1.5 Identical materials that have been assigned different QA levels cannot be stored in the same bin location. When the QA level of stock material is being upgraded or downgraded, the material being received will not be stored in the bin location with the stock material. Power Stores will complete TVA form 6523 when a completed AI-11 Attachment 9 has been received that shows a QA level change and/or QA description change for materials in stock. The change of QA level or description will not be considered complete until the Power Stores Section has received the file maintenance form (TVA 6523) from Data Control.

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Physical mixing of an item identified by use of the form 6509A, "red" bin tag with other item is prohibited. Physical separation of items can be made by use of jars, bins, trays, drawers, and their dividers will be utilized where the storage facilities exist. Larger items will be separated by storage spacing arrangements and stored, as necessary, on racks and in open floor areas of the plant and warehouses. Limited storage may also be made in the outside storage yard.

5.8.2 Items for storage shall be marked to preserve identity in accordance with the following criteria:

5.8.2.1 The specified identification shall be stamped, etched, stenciled, or otherwise marked on the item or on tags to be affixed to or contained securely with the item in plain, unobstructed view. When vibrating marking tools are used, they shall be fitted with a carbide marking tip or equivalent and shall be designed to provide a rounded impression not to exceed 0.010 inch in depth. Etching shall not be used on nickel alloys or on weld areas or sensitized areas of stainless steel. Electric arc marking pencils shall not be used.

5.8.2.2 The marking shall not be deleterious to the material nor violate any other section of this standard.

5.8.2.3 When tags are employed, they shall be of a material which will retain the marking and withstand weathering deterioration and other normal shipping and handling effects and shall not be detrimental to the item.

5.8.2.4 References to weights shall be in avoirdupois units. Duplicate markings in other systems may also be indicated.

5.8.2.5 The English language shall be used. Duplicate marking may be made in other languages.

5.8.2.6 Marking directly applied to austenitic stainless steel and nickel alloy metal surfaces shall be in accordance with SQA45, Part III, DPM N73E1, Section 1.8, Marking Materials.

5.8.3 Changing, correcting, or any other marking on Code Stamp nameplate is prohibited, unless authorized by the manufacturer whose serial number is applied.

5.9 Initial Preparation for Storage

The intent is to specify initial layup preparations and inspections to assure items have been conditioned for storage. Specific requirements are given in Section 5.11. (These requirements are not required to be backfitted for items already in stock upon issuance of this revision.)

5.9 Continued

- 5.9.1 Before storing in unheated areas, all water or other liquids capable of freezing at outside temperatures shall be drained from the equipment and stored separately.
- 5.9.2 Material shall be clean and free of contamination (dirt, oil residue other than preservative, metal chips, etc.)
- 5.9.3 Where excessive detrimental corrosion is experienced, approved corrosion inhibitors or a change in storage environment shall be employed.
- 5.9.4 Preservatives and corrosion inhibitors shall be approved per SQA45.

* 5.10 Periodic Inspection, Tests, and Maintenance

Inspections, tests, and maintenance performed on a periodic or planned basis ensures the integrity of the item and the adequacy of its storage conditions. Specific requirements are given in Section 5.11, Storage Requirements by Equipment Category.

Any equipment or material found to be in nonconformance shall be treated in accordance with AI-11.

5.10.1 General Inspection Requirement

The majority of the material stored by Power Stores does not require a rigorous periodic inspection, and no periodic inspection or maintenance requirements are listed in Section 5.11 for those items.

A quarterly general inspection shall be made of the condition of the storage area(s) and of the stored equipment within the area. Assistance from the responsible sections may be obtained as needed. This general inspection will be documented on a form similar to Attachment 2. A summary report of detrimental conditions shall be provided to the Assistant Supervisor, Nuclear Power Stores Section.

The Field Quality Engineering Section is required to perform a storage survey periodically, which may be done in conjunction with the Power Stores inspection.

5.10 Continued

5.10.2 Periodic Inspection or Maintenance (Especially Defined in Section 5.11)

An automated data processing system shall be used to generate a monthly printout of scheduled periodic inspections or maintenance as defined in Section 5.11. Distribution shall be made to the sections assigned to perform the inspections with a method for tracking the successful completion. Use a cover letter similar to Attachment 3. This is a quality assurance record to be retained with the monthly printout of scheduled periodic inspections of maintenance activities.

Inspection results on initial stock items shall be recorded on Attachment 4 form (or similar). Subsequent inspections must document the same results for meggar and polarization index tests as shown in Att. 4 and shall be quality assurance records.

5.11 Storage Requirements by Equipment Category

This section gives specific minimum requirements for different categories of equipment and material.

5.11.1 When needed, specific additional or different minimum storage requirements for particular items shall be prepared, using Attachment 5, approved as indicated, and retained by the Power Stores supervisor. That requirement will then be considered an extension of the storage requirements for that plant. Additions or changes to storage requirements for common items should be coordinated with the other plants.

5.11.2 Any package unit or assembly made up of lifetime components (not normally replaced) requiring greater protection during storage shall be stored to protect the most vulnerable part, unless specific instructions for that unit or assembly as a whole are given in this section. Components, such as rubber seals which can be replaced as normal maintenance, shall not be considered lifetime components.

5.11.3 (This paragraph left blank intentionally.)

5.11.4 It is not required that the requirements of this section be backfitted to items received before October 1, 1983.

STORAGE INSTRUCTIONS

5.11.5 Index	Paragraph
Motors Less Than Seven HP Including Fractional HP Motors	5.11.6
480-Volt Motors From Seven to 99 HP	5.11.7
480-Volt Motors and Motor Stators 100 HP or Greater and All 4-kV/6.6-kV Motors	5.11.8
Synchronous Motors, DC Motors, and Generators	5.11.9
Power Cable, Control Cable, Instrumentation Cable, and Wire	5.11.10
Semiconductors, Integrated Circuits, and Printed Circuit Boards	5.11.11
Capacitors (Electrolytic, Ceramic, Plastic Film, Clip, Mica, Oil Filled, and Paper)	5.11.12
Electronic Modules (Power Supplies, Signal Processors, Etc.)	5.11.13
Electromechanical Devices; Motor Controls, Breakers, Switches, and Relays	5.11.14
Materials with Natural Aging Life (Including Rubber Products)	5.11.15
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Pumps, Horizontal, with Pumped Oil Bearing Lubrication	5.11.17
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STORAGE INSTRUCTIONS

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	Valves, Rubber-Seated Butterfly	<u>Paragraph</u> 5.11.24
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	Charcoal (Activated), Bulk, Charcoal-Filled Trays, Canisters or Inserts	5.11.32
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STORAGE INSTRUCTIONS
Paragraph 5.11.6

ITEM - Motors Less Than Seven HP Including Fractional HP Motors

THIS INSTRUCTION ESTABLISHES THE MINIMUM REQUIREMENT FOR STORAGE AND PERIODIC INSPECTION AND MAINTENANCE

REFERENCES - None

STORAGE AREA - Indoor controlled

SPECIAL ENVIRONMENTAL CONDITIONS - None

PHYSICAL STORAGE AND PACKAGING CONDITIONS - None

INITIAL EQUIPMENT PREPARATION - None

PERIODIC INSPECTION OR MAINTENANCE - None

SPECIAL INSTRUCTION - None

STORAGE INSTRUCTIONS

Paragraph 5.11.7

ITEM - 480-Volt Motors From Seven to 99 HP.

THIS INSTRUCTION ESTABLISHES THE MINIMUM REQUIREMENT FOR STORAGE AND PERIODIC INSPECTION AND MAINTENANCE

REFERENCES - None

STORAGE AREA - Indoor Controlled

SPECIAL ENVIRONMENTAL CONDITIONS - None

PHYSICAL STORAGE AND PACKAGING CONDITION - None

INITIAL EQUIPMENT PREPARATION

1. For motors other than with sealed bearings or ball/roller bearings with grease fittings.
 - A. Horizontal motor--Ensure bearing reservoirs are filled to full level with oil. If required, request electrical maintenance to add approved lubricant. Rotate shaft to lubricate (approximately 15 revolutions).
 - B. Vertical Shaft Motors--Because of the variety of bearing and lubrication configurations, do not rotate the shaft before obtaining specific instructions on lubrication and shaft rotation from the cognizant electrical maintenance engineer.

PERIODIC INSPECTION OR MAINTENANCE

INTERVALS

Shaft rotation, horizontal motors (Note 1)

6 mo

SPECIAL INSTRUCTION

NOTE 1: Shaft rotation is for lubrication and to prevent possible galvanic corrosion between the shaft and bearing. Rotate the shaft in the direction of normal rotation approximately 15 turns, allowing the shaft to come to rest approximately 90 degrees from its previous position. Refer to special instructions provided by the cognizant engineer for all vertical shaft motors.

STORAGE INSTRUCTIONS

Paragraph 5.11.8

ITEM - 480-Volt Motors and Motor Stators 100 HP or Greater and All 4-kV/6.6-kV Motors.

THIS INSTRUCTION ESTABLISHES THE MINIMUM REQUIREMENT FOR STORAGE AND PERIODIC INSPECTION AND MAINTENANCE

REFERENCES- None

STORAGE AREA - Indoor controlled

SPECIAL ENVIRONMENTAL CONDITIONS - None

PHYSICAL STORAGE AND PACKAGING CONDITION - Dust protective cover allowing ventilation.

INITIAL EQUIPMENT PREPARATION

1. Horizontal Motor--Ensure bearing reservoirs are filled to full level with oil. If required, request electrical maintenance to add approved lubricant. Rotate shaft to lubricate (approximately 15 revolutions).
2. Vertical Shaft Motors--Because of the variety of bearing and lubrication configurations, do not rotate the shaft before obtaining specific written instructions on lubrication and shaft rotation from the cognizant electrical maintenance engineer.

PERIODIC INSPECTION OR MAINTENANCE

INTERVALS

Winding resistance (3-phase bridge)	Initial only
* Megger (in accordance with Attachment 1)	Initial + 12 mo
* Polarization (in accordance with Attachment 1)	Initial + 12 mo
Shaft Rotation, horizontal motors (Note 1)	3 mo

SPECIAL INSTRUCTION

NOTE 1: Shaft rotation is for lubrication and to prevent possible galvanic corrosion between the shaft and bearing. Rotate the shaft in the direction of normal rotation approximately 15 turns, allowing the shaft to come to rest approximately 90 degrees from its previous position. Refer to special instructions provided by the cognizant engineer for all vertical shaft motors.

STORAGE INSTRUCTIONS
Paragraph 5.11.9

ITEM - Synchronous Motors, DC Motors, and Generators (Fractional Horsepower Motors Not Included)

THIS INSTRUCTION ESTABLISHES THE MINIMUM REQUIREMENT FOR STORAGE AND PERIOD INSPECTION AND MAINTENANCE

REFERENCES - None

STORAGE AREA - Indoor controlled

SPECIAL ENVIRONMENTAL CONDITIONS - None

PHYSICAL STORAGE AND PACKAGING CONDITION - Dust protective cover allowing ventilation.

INITIAL EQUIPMENT PREPARATION

If machine has bearing lubrication reservoirs, ensure reservoirs are filled to full level. If required, request electrical maintenance to add approved lubricant. Rotate shaft to lubricate (approximately 15 revolutions).

To prevent galvanic corrosion, the brushes shall be lifted off the commutator. Assure that the brush holders do not contact the commutator. Bag or box the brushes, mark to identify the motor, and attach to motor/generator for storage.

PERIODIC INSPECTION OR MAINTENANCE

INTERVALS

Winding Resistance (3-phase only)(in accordance with Attachment 1)	Initial only
500-Volt megger (Note 1)	Initial + 12 mo
Megger (Note 2)	Initial + 12 mo
Shaft rotation, horizontal motors (Note 3)	3 mo, 100 HP and above 6 mo, 7 to 99 HP

SPECIAL INSTRUCTION

- NOTE 1: DC motors and fields of generators and synchronous (except brushless excitation) motors. Megger in accordance with Attachment 1).
- NOTE 2: Stators meggered to a value consistent with motor voltage. Megger in accordance with Attachment 1.
- NOTE 3: Shaft rotation is for lubrication. Rotate approximately 15 turns, allowing the shaft to come to rest approximately 90 degrees from its previous positions.

STORAGE INSTRUCTIONS

Paragraph 5.11.10

ITEM - Power Cable, Control Cable, Instrumentation Cable (Note 1), and Wire.

THIS INSTRUCTION ESTABLISHES THE MINIMUM REQUIREMENT FOR STORAGE AND PERIODIC INSPECTION AND MAINTENANCE

REFERENCES - None

STORAGE AREA - Indoor or outdoor (Note 2). Indoor for wire.

SPECIAL ENVIRONMENTAL CONDITIONS - None

PHYSICAL STORAGE AND PACKAGING CONDITION - For outdoor storage, cable shall be under a sun and rain shelter and wrapped or covered. The cable ends shall be capped (tape, heat shrink cap, etc.).

INITIAL EQUIPMENT PREPARATION - None

PERIODIC INSPECTION OR MAINTENANCE

NOTE 1: Instrumentation cable includes coaxial or multiconductor cable.

NOTE 2: Cable with special exterior insulation, such as asbestos shall be stored indoors. Cable is suitable for outdoor storage if the exterior covering is of the usual tough, dense material which is molded (extruded) over the interior construction.

STORAGE INSTRUCTIONS

Paragraph 5.11.11

ITEM - Semiconductors, Integrated Circuits, and Printed Circuit (PC) Boards.
THIS INSTRUCTION ESTABLISHES THE MINIMUM REQUIREMENT FOR STORAGE AND PERIODIC INSPECTION AND MAINTENANCE

REFERENCES - None

STORAGE AREA - Indoor controlled

SPECIAL ENVIRONMENTAL CONDITIONS - None

PHYSICAL STORAGE AND PACKAGING CONDITION

1. Devices shall be dust free in storage as would be provided by a closed drawer or full-wrap package.
2. All devices purchased as matched pairs shall remain together in the same package.
3. Metal oxide semiconductors and printed circuit boards containing MOS devices require special handling. See special instructions.
4. PC boards are easily damaged by bending or hitting. Handle carefully and store in a protective manner.

INITIAL EQUIPMENT PREPARATION - None

PERIODIC INSPECTION OR MAINTENANCE - None

SPECIAL INSTRUCTION

Metal Oxide Semiconductor Device Protection:

Definitions

SCR--Silicon Controlled Rectifier

MOS--Metal-Oxide Semiconductor

MOSFET--Metal Oxide Semiconductor Field Effect Transistor

JFET--Junction Field Effect Transistor, also called FET, Field Effect Transistor.

STORAGE INSTRUCTIONS

Paragraph 5.11.11 (Continued)

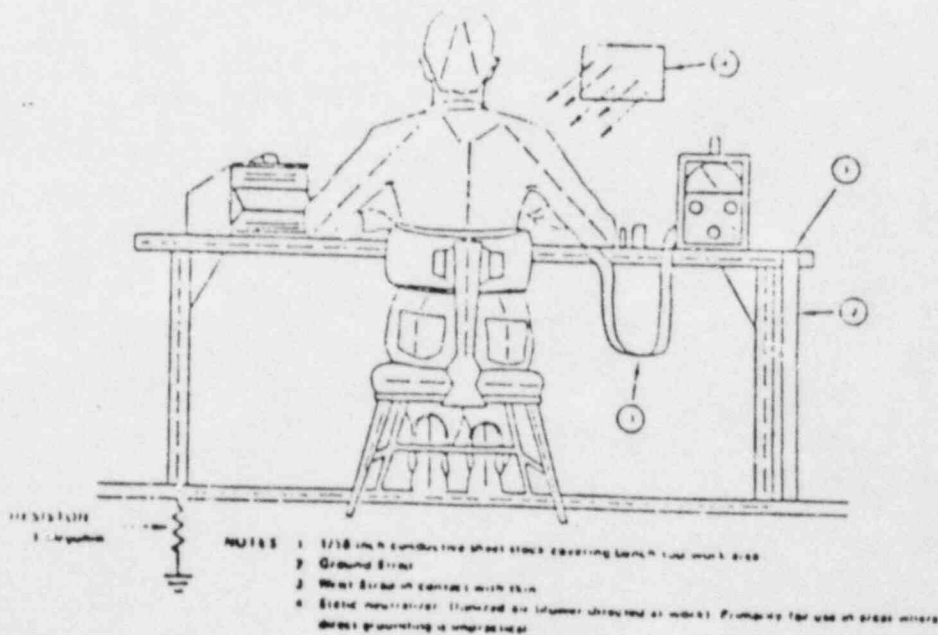
Direct handling of MOS devices requires special precautions and facilities. An MOS device can be damaged by static voltage discharges which can be generated by a person walking across a waxed floor or by material that holds a static charge (in the order of 4 to 15 kV).

MOS devices or PC boards containing MOS devices will usually be received from the vendor in a protective package, such as conductive foam, antistatic plastic tubes or antistatic plastic wrap. This is the condition in which they must be stored.

MOS devices shall be identified at receipt and plainly marked for future identification. The purchase order originator or cognizant instrument mechanic or engineer may be required to assist in identification.

MOS devices shall remain unhandled in their original protective container for storage.

A facility, described below, shall be provided within Power Stores for handling MOS devices when issued. A knowledgeable person receiving the device from Power Stores shall utilize the facility within Power Stores to remove the desired quantity and leave the remainder in the original condition. This will require the attendance of a Power Stores representative.



Typical Work Station

A supply of conductive foam must be available for repackaging.
Examples: (Conductive foam) ECCOSORB LS26 from Emmerson and Cumming, Inc.
or high density-Unitool P/N 4013B - 3/8" thick

Paragraph 5.11.11 (Continued)

MOS Device Handling Facility

All MOS devices should be placed on a grounded bench surface, and operators should ground themselves before handling devices. Wrist straps in contact with skin are needed because a worker can be statically charged with respect to the bench surface (see figure on page 23).

Nylon or other static-generating materials should not come in contact with MOS circuits.

STORAGE INSTRUCTIONS

Paragraph 5.11.12

ITEM - Capacitors (Electrolytic, Ceramic, Plastic Film, Clip, Mica, Oil Filled and Paper).

THIS INSTRUCTION ESTABLISHES THE MINIMUM REQUIREMENT FOR STORAGE AND PERIODIC INSPECTION AND MAINTENANCE

STORAGE AREA - Indoor Controlled

SPECIAL ENVIRONMENTAL CONDITIONS - Aluminum electrolytic capacitors shall be stored at a maximum temperature of 104°F.

PHYSICAL STORAGE AND PACKAGING CONDITION - Different lots of aluminum electrolytic capacitors shall be identified with the date received and stored so as not to lose receipt date identification.

INITIAL EQUIPMENT PREPARATION - None

PERIODIC INSPECTION OR MAINTENANCE - Aluminum electrolytic capacitors shall not be stored by Power Stores for a period greater than three years. After approximately two years, replacement stock shall be ordered and prior to three years, unused aluminum electrolytic capacitors shall be purged. Maximum/minimum values may be decreased to prevent long-term storage of the capacitors and to optimize stock to that amount expected to be utilized within three years.

SPECIAL INSTRUCTION

Recommended Practice: At the time of issue, Power Stores should inform the user on how long the capacitors have been in Power Stores storage.

STORAGE INSTRUCTIONS

Paragraph 5.11.13

ITEM - Electronic Modules (Power Supplies, Signal Processors, Etc.)

THIS INSTRUCTION ESTABLISHES THE MINIMUM REQUIREMENT FOR STORAGE AND PERIODIC INSPECTION AND MAINTENANCE

REFERENCES - None

STORAGE AREA - Indoor Controlled

SPECIAL ENVIRONMENTAL CONDITIONS - None

PHYSICAL STORAGE AND PACKAGING CONDITION -

1. Devices shall be dust free in storage as would be provided by a closed drawer or full-wrap package.
2. Vibration free.
3. Mark modules with date received.

INITIAL EQUIPMENT PREPARATION - None

PERIODIC INSPECTION OR MAINTENANCE - None

SPECIAL INSTRUCTION

Certain electronic modules may require testing to determine if they are functional. When these particular modules have been identified to Power Stores by the cognizant engineering section, Power Stores shall notify the section representative when the modules are received so that they may be tested.

Recommended Practice: Arrange for modules to be tested before completion of receipt/inspection procedures so that the module may be returned to the vendor immediately if faulty.

STORAGE INSTRUCTIONS

Paragraph 5.11.14

ITEM - Electromechanical Devices; Motor Controls, Breakers, Switches, and Relays.

THIS INSTRUCTION ESTABLISHES THE MINIMUM REQUIREMENT FOR STORAGE AND PERIODIC INSPECTION AND MAINTENANCE

REFERENCES - None

STORAGE AREA - Indoor Controlled

SPECIAL ENVIRONMENTAL CONDITIONS - None

PHYSICAL STORAGE AND PACKAGING CONDITION -

1. Devices shall be dust free in storage as would be provided by a closed drawer or full-wrap package.
2. Store in a manner that protects against accidental impact damage, such as semiclosed bins, boxes, drawers, etc.

INITIAL EQUIPMENT PREPARATION - None

PERIODIC INSPECTION OR MAINTENANCE - None

SPECIAL INSTRUCTION - None

STORAGE INSTRUCTIONS

Paragraph 5.11.15

ITEM - Materials with Natural Aging Life (Including Rubber Products)

THIS INSTRUCTION ESTABLISHES THE MINIMUM REQUIREMENT FOR STORAGE AND PERIODIC INSPECTION AND MAINTENANCE

REFERENCES - Shelf Life Considerations for Materials with Natural Aging Life - AI-11, Attachment 4

STORAGE AREA - Indoor Controlled

SPECIAL ENVIRONMENTAL CONDITIONS - None

PHYSICAL STORAGE AND PACKAGING CONDITION -

1. Store in a sealed airtight package assuring no excessive moisture and no contamination.
2. Store out of the sunlight. Adequate protection would be a drawer or opaque bag.

INITIAL EQUIPMENT PREPARATION - None

SPECIAL INSTRUCTION

1. When necessary to handle material directly in preparation for long-term storage, use clean gloves to prevent contamination from body oils and acids.
2. These requirements are derived from and consistent with DPM N77A2.
3. Storage conditions have significant impact on the life of materials which deteriorate with age. Environmental conditions determine to a great extent the time required for a material to deteriorate beyond use. The Power Stores supervisor, with assistance from plant engineers, shall determine the methods and conditions for the material of that specific item.

Paragraph 5.11.15 (Continued)

SPECIAL INSTRUCTIONS - Continued

4. Many rubber products are very sensitive to storage conditions. These storage conditions determine to a great extent the useful life of rubber products. Storage conditions should be such that the exposure of these products to light or radiation, temperature extremes, and circulating air is minimized. The following storage methods are suggested to allow maximum shelf life.
 - A. Exposure to light can be minimized or prevented by storing the items in a container that does not transmit excessive light. Small items that are normally stored in clear plastic bottles should be stored in amber colored plastic bottles ¹ that transmit enough light to permit reading the bin tag inside. Larger items can be stored in dark plastic bags ² (black, green, or brown) and tagged externally.
 - B. All containers should be sealed sufficiently to prevent air circulation.
 - C. Exposures to radiation can be prevented by storing all items in the Power Stores Warehouse.
 - D. Exposure to ozone can be prevented by keeping contained sealed and preventing the items from being stored near generating electrical devices.
 - E. All items shall be stored in a temperature environment no higher than 140°F.

¹Amber colored plastic bottles are available from Parkway Plastics, Inc., P.O. Box 475, Shelton Road, Piscataway, New Jersey 08854.

²Amber colored, zip-lock bags can be ordered from Associated Bag Company, 160 South Second Street, Milwaukee, Wisconsin 53204, Item No. 63B; sizes 2 by 2-1/2, 3 by 5 4 by 6, 2-1/2 by 9.

STORAGE INSTRUCTIONS

Paragraph 5.11.16

ITEM - Hazardous Chemicals, Paints, Solvents, and Other Materials of Like Nature.

THIS INSTRUCTION ESTABLISHES THE MINIMUM REQUIREMENT FOR STORAGE AND PERIODIC INSPECTION AND MAINTENANCE

REFERENCES - None

STORAGE AREA - See special instruction.

SPECIAL ENVIRONMENTAL CONDITIONS - See special instruction

PHYSICAL STORAGE AND PACKAGING CONDITION - See special instruction

INITIAL EQUIPMENT PREPARATION - None

SPECIAL INSTRUCTION

Recommended Practice: Hazardous chemicals, paints, solvents, and other materials of like nature should be stored in a designated well-ventilated area away from or separately from other stored items. If placement of chemicals in a storage area with other material and equipment is necessary, then it should be done to minimize the effect of accidental release of flammable or corrosive fumes or dust. The following list contains some of the categories and materials that should be stored separately or away from other types of nuclear plant components or materials.

Explosives--to be stored separately from other material:

Cadweld powder
Impact cartridges

STORAGE INSTRUCTIONS

Paragraph 5.11.16 (Continued)

Flammables--To be stored separately from other material:

- Paints and Thinner
- NDE Cleaners
- Contact Cement
- Duct Seal
- Solvents
- PVC Cements
- Methanol
- Liquid Grout Activators
- Reducing Agents
- Epoxies
- Silica Solutions
- Deoxaluminite
- Concrete Hardeners
- Hydrocarbon Based Resins

Corrosives--Away from other equipment and materials:

- Fluorocarbons
- Lithium Bromide Solutions
- Battery Electrolytes
- Concrete Retarder
- Amino Acid
- Salts and Salt-Based Chemicals
- Catalyst Reducers

Other--Away from other equipment and materials:

- Hydrocarbons--Oils, Hydraulic Fluid, etc.
- Building Paper (Tar Based)
- Polyurethane
- Pipe Coating (Asphalt Based)
- Roof Coating (Asphalt Based)
- Electrical Cable Fireproofing Materials
- Galvanizing Compounds

STORAGE INSTRUCTIONS
Paragraph 5.11.17

ITEM

Pumps, Horizontal, with Pumped Oil Bearing Lubrication.

THIS INSTRUCTION ESTABLISHES THE MINIMUM REQUIREMENT FOR STORAGE AND PERIODIC INSPECTION AND MAINTENANCE

REFERENCES

None.

STORAGE AREA

Indoor.

SPECIAL ENVIRONMENTAL CONDITIONS

None.

PHYSICAL STORAGE AND PACKAGING CONDITION

Keep pump openings covered to prevent entrance of foreign objects.

INITIAL EQUIPMENT PREPARATION

Mechanical seals, when shipped separately, should be stored in accordance with instructions for seals and packing.

PERIODIC INSPECTION OR MAINTENANCE

Remove bearing caps, lubricate bearings and journals, and rotate shaft. Replace caps (Note 1).

INTERVALS

Initial + 6 mos

SPECIAL INSTRUCTION

NOTE 1: Shaft rotation is for lubrication and to prevent possible galvanic corrosion between the shaft and bearing. Rotate the shaft enough to get a good coating of lubrication, allowing the shaft to come to rest approximately 90 degrees from its previous position.

STORAGE INSTRUCTIONS

Paragraph 5.11.18

ITEM - Pumps, Horizontal, With Oil Reservoir Lubricated Bearings.

THIS INSTRUCTION ESTABLISHES THE MINIMUM REQUIREMENT FOR STORAGE AND PERIODIC INSPECTION AND MAINTENANCE

REFERENCES - None

STORAGE AREA - Indoor

SPECIAL ENVIRONMENTAL CONDITIONS - None

PHYSICAL STORAGE AND PACKAGING CONDITION - Keep pump openings covered to prevent entrance of foreign objects.

INITIAL EQUIPMENT PREPARATION

1. Mechanical seals, when shipped separately, should be stored in accordance with instructions for seals and packing.
2. Assure bearing reservoirs are filled to full level with lubricant. Rotate shaft to lubricate (approximately 15 revolutions).

PERIODIC INSPECTION OR MAINTENANCE

Shaft rotation (Note 1).

INTERVALS

3 mos.

SPECIAL INSTRUCTION

NOTE 1: Shaft rotation is for lubrication and to prevent possible galvanic corrosion between the shaft and bearing. Rotate the shaft in the direction of normal rotation approximately 15 turns for a good coating of lubrication, allowing the shaft to come to rest approximately 90 degrees from its previous position.

STORAGE INSTRUCTIONS

Paragraph 5.11.19

ITEM - Pumps, Centrifugal, With Water (Pumped Medium) Lubricated Bearings.

THIS INSTRUCTION ESTABLISHES THE MINIMUM REQUIREMENT FOR STORAGE AND PERIODIC INSPECTION AND MAINTENANCE

REFERENCES - None

STORAGE AREA - Indoor

SPECIAL ENVIRONMENTAL CONDITIONS - None

PHYSICAL STORAGE AND PACKAGING CONDITION - Keep pump openings covered to prevent entrance of foreign objects.

INITIAL EQUIPMENT PREPARATION

Mechanical seals, when shipped separately, should be stored in accordance with instructions for seals and packing.

PERIODIC INSPECTION OR MAINTENANCE - None

SPECIAL INSTRUCTION - None

STORAGE INSTRUCTIONS

Paragraph 5.11.20

ITEM - Large Turbo Machinery Rotors.

THIS INSTRUCTION ESTABLISHES THE MINIMUM REQUIREMENT FOR STORAGE AND PERIODIC INSPECTION AND MAINTENANCE

REFERENCES - Ingersoll-Range, Turbo Products Department, "Care and Protection of Rotors" (included in special instructions).

STORAGE AREA - See special instructions

SPECIAL ENVIRONMENTAL CONDITIONS - See special instructions

PHYSICAL STORAGE AND PACKAGING CONDITION - See special instructions

INITIAL EQUIPMENT PREPARATION - See special instructions

PERIODIC INSPECTION OR MAINTENANCE - See special instructions

SPECIAL INSTRUCTION

Storage of turbine, pump, and compressor rotors require consideration on an individual basis. In general, it requires special damage protection, corrosion protection, and periodic rotation. They may be shipped in various conditions. Contact the purchasing source or cognizant maintenance engineer or his representative for specific instructions.

Care and Protection of Rotors

The following recommendations apply to the care and protection, after shipment, for all I-R Co. manufactured rotors which are shipped separately from the main equipment:

1. Rotation of Rotors Mounted in a Horizontal Position

The rotor should be rotated 125 degrees, no more and no less, once a month. This is to prevent formation of a permanent sag in the rotor.

STORAGE INSTRUCTIONS

Paragraph 5.11.20 (Continued)

2. Storage of Rotors

- a. It is an I-R Co. standard practice to mount separately shipped rotors in crates, in a horizontal position. These crates should be stored horizontally.
- b. Rotors may be stored in a vertical position. If the customer elects to store rotors in a vertical position, especially designed crates are required. Vertical storage of rotors eliminates the necessity of periodic rotation of the rotor, as required with a horizontal mounted rotor. If a customer decides to store a rotor in a vertical position, it is recommended that I-R Co. Engineering Department either design the crate or review and approve the customer's design.

3. Periodic Inspection and Maintenance of Rotors

- a. After periodic rotation of horizontally mounted rotors, noted in paragraph 1, all protective wrappings should be renewed or replaced, as required.
- b. All rotors stored in excess of 30 days shall be inspected periodically as follows:
 - (1) Domestic Shipments: Once a month.
 - (2) Extended Storage and Export-Boxed Shipments: Once every two months.
- c. Inspection of rotors should include the following:
 - (1) Domestic Shipments:
Corrosion preventive coatings should be inspected and renewed, as required.
 - (2) Extended Storage and Export Boxed Shipments:
VPI bags should be inspected and replaced as required.
Corrosion preventive coatings should also be inspected and renewed as required.

STORAGE INSTRUCTIONS

Paragraph 5.11.20 (Continued)

- d. Rotors having evidence of corrosion or pitting should be a cause of review of adequacy of storage procedures. Customer should have an I-R Co. serviceman inspect and report on all rotors found to have corrosion or pitting, for corrective action.
- e. An inspection record is to be kept by the customer, listing date of initial inspection and each subsequent inspection. Inspection record should be attached to the rotor or rotor storage crate, in such a manner that it can be seen and cannot be accidentally removed.
- f. All rotors should be stored in an enclosed, dry building and properly blocked off the floor to prevent possibility of water damage.

Rotors for domestic shipment should be stored in heated buildings to provide maximum protection from moisture condensation on rotors, in locations of high humidity.
- g. When corrosion preventive coatings have to be repaired or renewed, the parts should be coated with an approved corrosion preventive.

STORAGE INSTRUCTIONS
Paragraph 5.11.21

ITEMS

Seals and Packing (for Pumps and Valves).

THIS INSTRUCTION ESTABLISHES THE MINIMUM REQUIREMENT FOR STORAGE AND PERIODIC INSPECTION AND MAINTENANCE

REFERENCES

None.

STORAGE AREA

Indoor controlled.

SPECIAL ENVIRONMENTAL CONDITIONS

None.

PHYSICAL STORAGE AND PACKAGING CONDITION

1. Mechanical seals should not be handled so as to come in contact with the skin.
2. Recommended practice: Leave seals and packing in original individual wrappings or containers.
3. Handle unwrapped mechanical seals with cotton gloves.
4. The wrapping for seals and packing shall be dust tight.

INITIAL EQUIPMENT PREPARATION

Exposed mechanical seal surfaces are very susceptible to damage and are conditioned for storage by the factory, depending on the material. No additional preparation is required.

PERIODIC INSPECTION OR MAINTENANCE

None.

SPECIAL INSTRUCTION

O-rings shall be stored in accordance with the instructions for materials with natural aging life.

STORAGE INSTRUCTIONS

Paragraph 5.11.22

ITEM - Pipe (Tubular Products), Bar, Plate Fittings, Mechanical Fasteners, Washers, and Retaining Rings

THIS INSTRUCTION ESTABLISHES THE MINIMUM REQUIREMENT FOR STORAGE AND PERIODIC INSPECTION AND MAINTENANCE

REFERENCES - None

STORAGE AREA - Pipe (Tubular Products), Bar, Plate--Outdoor. Fittings, Mechanical Fasteners, Washers, and Retaining Rings--Outdoor

SPECIAL ENVIRONMENTAL CONDITIONS - Austenitic stainless steel stored outdoors shall be under cover and protected from unusual and excessive deposits of dirt and contamination.

NOTE: This requirement is temporarily waived pending completion of new storage facilities; Ref. LL3 830810 879.

PHYSICAL STORAGE AND PACKAGING CONDITION

1. Austenitic stainless steel tubular products stored outdoors shall have end caps.
2. Recommended Practice: Bulk storage of small fittings, fasteners, washers, retaining rings should be segregated and stored in a covered container.
3. Weld preps for prefabbed pipe shall be capped to provide impact damage protection. This does not apply to stock (random length) pipe.

INITIAL EQUIPMENT PREPARATION - None

PERIODIC INSPECTION OR MAINTENANCE - None

SPECIAL INSTRUCTION

Refer to Section 5.7.4, Austenitic Stainless Steel Material, for general requirements for storage.

STORAGE INSTRUCTIONS

Paragraph 5.11.23

ITEM - Valves, Diaphragm.

THIS INSTRUCTION ESTABLISHES THE MINIMUM REQUIREMENT FOR STORAGE AND PERIODIC INSPECTION AND MAINTENANCE

REFERENCES - None

STORAGE AREA - Indoor Controlled

SPECIAL ENVIRONMENTAL CONDITIONS - None

PHYSICAL STORAGE AND PACKAGING CONDITION

1. Store in a sealed airtight package to ensure against excessive moisture and contamination.
2. The valve shall be unseated.

INITIAL EQUIPMENT PREPARATION

Valves are normally shipped in a sealed plastic bag containing a suitable desiccant. If this is so and the enclosure is intact, store as is. Desiccant will not be maintained.

PERIODIC INSPECTION OR MAINTENANCE - None

SPECIAL INSTRUCTION - None

STORAGE INSTRUCTIONS

Paragraph 5.11.24

ITEM - Valves, Rubber-Seated Butterfly.

THIS INSTRUCTION ESTABLISHES THE MINIMUM REQUIREMENT FOR STORAGE AND PERIODIC INSPECTION AND MAINTENANCE

REFERENCES - None

STORAGE AREA - Indoor

SPECIAL ENVIRONMENTAL CONDITIONS - None

PHYSICAL STORAGE AND PACKAGING CONDITION

1. Store with the valve unseated.
2. Provide caps or covers for valve openings.
3. For wafer-type butterfly valves, see special instructions.

INITIAL EQUIPMENT PREPARATION

None.

PERIODIC INSPECTION OR MAINTENANCE - None

SPECIAL INSTRUCTION

Wafer-type butterfly valves do not have sufficient body width to permit unseating and installation of end caps. These valves should be unseated, corrosion inhibitor applied or intact, and provided a full wrap package.

STORAGE INSTRUCTIONS

Paragraph 5.11.25

ITEM - Valves, Manual-Operated with Metal-to-Metal Seats (Gate, Globe, Ball, Checkvalves).

THIS INSTRUCTION ESTABLISHES THE MINIMUM REQUIREMENT FOR STORAGE AND PERIODIC INSPECTION AND MAINTENANCE

STORAGE AREA - Indoor

SPECIAL ENVIRONMENTAL CONDITIONS - None

PHYSICAL STORAGE AND PACKAGING CONDITION

1. Store with the valve unseated (gate, globe, and ball)
2. Provide caps or covers over openings for valves two inches and over. Valve opening covers are not required for smaller valves that are stored in an area or container that protects against debris and insects.

INITIAL EQUIPMENT PREPARATION

None.

PERIODIC INSPECTION OR MAINTENANCE - None

SPECIAL INSTRUCTION

Limitorque Valve Assemblies -- Do not attempt to lift the valve assembly by lifting lugs secured on the motor operator. These are provided for convenience during valve assembly and disassembly.

STORAGE INSTRUCTIONS

Paragraph 5.11.26

ITEM - Valves, Solenoid Operator Attached

THIS INSTRUCTION ESTABLISHES THE MINIMUM REQUIREMENT FOR STORAGE AND PERIODIC INSPECTION AND MAINTENANCE

REFERENCES - None

STORAGE AREA - Indoor

SPECIAL ENVIRONMENTAL CONDITIONS - None

PHYSICAL STORAGE AND PACKAGING CONDITION

Protect exposed electrical connections with dust and insect-proof wrapping or storage container.

INITIAL EQUIPMENT PREPARATION

None.

PERIODIC INSPECTION OR MAINTENANCE - None

SPECIAL INSTRUCTION - None

STORAGE INSTRUCTIONS

Paragraph 5.11 27

ITEM - Valves, Air-Operated, Motor-Operated (Limitorque, etc.)

THIS INSTRUCTION ESTABLISHES THE MINIMUM REQUIREMENT FOR STORAGE AND PERIODIC INSPECTION AND MAINTENANCE

STORAGE AREA - Indoor Controlled

SPECIAL ENVIRONMENTAL CONDITIONS - None

PHYSICAL STORAGE AND PACKAGING CONDITION

1. Store with the valve unseated.
2. Provide caps or covers for valve opening.
3. Store motor-operated valves with the motor in a horizontal position to prevent possibility of oil leaking into the motor case.

INITIAL EQUIPMENT PREPARATION

Plug or place tape (approved in accordance with SQA 45, Part III, DPM N73E1) over air line openings in air operators.

PERIODIC INSPECTION OR MAINTENANCE - None

SPECIAL INSTRUCTION - None

STORAGE INSTRUCTIONS

Paragraph 5.11.28

ITEM - Snubbers, Hydraulic and Mechanical

THIS INSTRUCTION ESTABLISHES THE MINIMUM REQUIREMENT FOR STORAGE AND PERIODIC INSPECTION AND MAINTENANCE

STORAGE AREA - Indoor

SPECIAL ENVIRONMENTAL CONDITIONS - None

PHYSICAL STORAGE AND PACKAGING CONDITION

Spherical bearings and piston rods on hydraulic snubbers must not be scratched, nicked, allowed to corrode, or be otherwise damaged. Physical protection must be provided to prevent damage of this nature.

INITIAL EQUIPMENT PREPARATION

Do not remove vendor installed packaging which protects critical snubber parts, such as sight glasses, spherical bearings, and piston rods on hydraulic snubbers until snubbers are ready for installation.

PERIODIC INSPECTION OR MAINTENANCE - None

SPECIAL INSTRUCTION - None

STORAGE INSTRUCTIONS

Paragraph 5.11.29

ITEM - Resistors, Inductive or Solenoid Coils, Dry-Type Transformers

THIS INSTRUCTION ESTABLISHES THE MINIMUM REQUIREMENT FOR STORAGE AND PERIODIC INSPECTION AND MAINTENANCE

REFERENCES - None

STORAGE AREA - Indoor Controlled

SPECIAL ENVIRONMENTAL CONDITIONS - None

PHYSICAL STORAGE AND PACKAGING CONDITION

Dust protective wrapping or storage container.

INITIAL EQUIPMENT PREPARATION - None

PERIODIC INSPECTION OR MAINTENANCE - None

SPECIAL INSTRUCTION - None

STORAGE INSTRUCTIONS

Paragraph 5.11.30

ITEM - Batteries, Lead-Acid Type

THIS INSTRUCTION ESTABLISHES THE MINIMUM REQUIREMENT FOR STORAGE AND PERIODIC INSPECTION AND MAINTENANCE

REFERENCES - DPM (on lead acid batteries - not yet released).

STORAGE AREA

Indoor conditions as specified in facility and storage area requirements (Paragraph 5.6.2) except temperature limits are 40 to 100 degrees Fahrenheit. Optimum storage temperature range is 55 to 77 degrees Fahrenheit.

SPECIAL ENVIRONMENTAL CONDITIONS - See storage area (above).

PHYSICAL STORAGE AND PACKAGING CONDITION

1. Batteries will normally be stored for a period of up to six or eight months.
2. Store in the shipping container mainly to keep the battery clean.
3. Take caution against physical damage to battery cases. Store in a protected area or with barriers to protect batteries from accidental damage.
4. Also, see Special Instructions.

INITIAL EQUIPMENT PREPARATION

Dry batteries (no electrolyte) shall be stored with plastic vent seals in place unless the cells have been filled with electrolyte. This prevents foreign matter from entering and contaminating cells.

PERIODIC INSPECTION OR MAINTENANCE - See Special Instructions

SPECIAL INSTRUCTION

The maximum storage time without service shall be determined by the cognizant engineer. When required, periodic servicing instructions and implementation shall be the responsibility of the cognizant engineering group. If it becomes necessary to hold batteries in storage in some other configuration in order to conduct periodic servicing or charging, then special storage instruction shall be provided by the cognizant engineering section as prescribed in Paragraph 5.11.1 of this document.

STORAGE INSTRUCTIONS
Paragraph 5.11.01

ITEM

Gasket, Preformed.

THIS INSTRUCTION ESTABLISHES THE MINIMUM REQUIREMENT FOR STORAGE AND PERIODIC INSPECTION AND MAINTENANCE

REFERENCES

SQA45, Part III, DPM N76A4, Appendix L, Spiral-Wound Gaskets

STORAGE AREA

Indoor.

SPECIAL ENVIRONMENTAL CONDITIONS

None

PHYSICAL STORAGE AND PACKAGING CONDITIONS

Gaskets shall not be deformed because of the storage package or position.

Gaskets which are thin and flexible to the extent of being susceptible to damage because of normal handling shall be boxed or backed or otherwise supported.

Gaskets shall be dust free in storage as would be provided by a closed drawer or full-wrap package.

Also, see Special Instructions.

INITIAL EQUIPMENT PREPARATION

None

PERIODIC INSPECTION OR MAINTENANCE

None

PERIODIC INSPECTION OR MAINTENANCE

None

SPECIAL INSTRUCTION

Spiral-Wound Gaskets:

Gaskets used in stainless steel piping systems are to be free from chloride contamination. The surfaces of spiral-wound gaskets are particularly susceptible to retain contamination. Caution shall be taken in the handling and issuing of gaskets to prevent chloride contamination, especially by contact with skin and perspiration.

STORAGE INSTRUCTIONS

Paragraph 5.11.32

ITEM - Activated Charcoal, Bulk, Charcoal-filled Trays, Canisters, or Inserts.

THIS INSTRUCTION ESTABLISHES THE MINIMUM REQUIREMENT FOR STORAGE AND PERIODIC INSPECTION AND MAINTENANCE

REFERENCES - None

STORAGE AREA - Indoor Controlled.

SPECIAL ENVIRONMENTAL CONDITIONS

Temperature: 35 to 110 degeees Fahrenheit (may be exceeded [up to 120 degrees Fahrenheit] for short periods of time).

Relative Humidity: 90 percent maximum.

Gaseous Contamination: The storage area shall be free of regular or continuous sources of smoke, exhaust fumes, or vapors from volatile or aromatic chemicals and liquids. Occasional use of forklift is permissible.

PHYSICAL STORAGE AND PACKAGING CONDITION

Bulk charcoal and components containing charcoal shall be protected by a full plastic or vapor varrier wrap with taped seams.

INITIAL EQUIPMENT PREPARATION - None

PERIODIC INSPECTION OR MAINTENANCE - None

SPECIAL INSTRUCTION

Precautions:

Activated charcoal is impregnated with a chemical compound which, when mixed with water, generates an acid with a particular affinity for stainless steels. If the charcoal becomes wetted by any process (roof leakage, fire protection system actuation, etc.), the containers must be emptied and thoroughly flushed as soon as possible to prevent damage to the stainless steel components.

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STORAGE INSTRUCTIONS

Paragraph 5.11.33

ITEM - Ion Exchange Resin

THIS INSTRUCTION ESTABLISHES THE MINIMUM REQUIREMENT FOR STORAGE AND PERIODIC INSPECTION AND MAINTENANCE

REFERENCES - None

STORAGE AREA - Indoor

SPECIAL ENVIRONMENTAL CONDITIONS

Store at temperatures from 40°F to 90°F.

PHYSICAL STORAGE AND PACKAGING CONDITION - None

INITIAL EQUIPMENT PREPARATION - None

PERIODIC INSPECTION OR MAINTENANCE - None

SPECIAL INSTRUCTION - None

6.0 HANDLING

- 6.1 Routine Handling Requirements--Items shall be handled in accordance with good handling practices to minimize damage and preserve the quality of the item and container. General handling practices shall be established and as a minimum address the following.
- a. Observe handling precautions upon receipt, as outlined on outer packaging of materials received.
 - b. Provide adequate protection for any machined surfaces when handling.
 - c. Refer to plant safety requirements concerning handling of chemicals or compressed gases and other potentially hazardous materials and observe precautions on labeling.
 - d. Avoid leaning, propping, or stacking materials or equipment in unstable configurations.
 - e. Avoid unnecessary handling of materials while in storage to minimize the possibility of damage or distortion.
 - f. Observe handling of materials with a known shelf life to such an extent that old stock is withdrawn first. Such items would include but not be limited to certain electronic components and rubber products, batteries, and paints.
 - g. Procurement documents for hoisting equipment (e.g., cranes, rigging, slings) shall require certification of load ratings. When vendors are unable to provide such certification, NUC PR may provide the certification through performance of appropriate load tests as referenced in paragraph 6.1.h and the applicable Sections of 6.1.i below. Hoisting equipment shall not be used until such certification is available. (This requirement applies only to equipment purchased after 3/31/81.)
 - h. The handling requirements of ANSI N45.2.2 as implemented by DPM No. N74M15, Inspection, Testing, Maintenance, and Operation of Nuclear Plant Cranes and Hoists, shall be followed. An inspection program for equipment and rigging, governed by the above standards, shall be established. Any defective, contaminated, or overloaded hoisting equipment and frayed, worn, or otherwise deteriorated rigging shall be identified and segregated and shall not be used.

6.1 Conitnued

- i. For special lifts, hoisting equipment may be re-rated, or modified and re-rated, upon approval by the manufacturer. If the manufacturer's specifications are not available, the limitations assigned to the equipment shall be based on the determinations of a qualified engineer competent in this field and such determinations shall be documented and recorded appropriately. Rerated equipment shall be given a dynamic load test over the full range of the lift using a test weight at least equal to the lift weight. A dynamic test includes raising, lowering, and traversing the load in contrast to a static test where the test at least equal to the life weight. A dynamic test includes raising, lowering, and traversing the load in contrast to a static test where the test weight may be increased incrementally with no movement.

In lieu of this requirement, the test weight used in temporarily re-rating hoisting equipment for special lifts shall be at least equal to 110% of the lift weight.
- j. Equipment and rigging shall be kept clean and free of contaminants that are detrimental to the material being handled.
- k. Rigging items such as hooks, shackles, and turnbuckles that appear to have yielded or are distorted shall not be used.
- l. Hoisting equipment shall not be loaded beyond its rated load except for test purposes.
- m. Carbon steel rigging equipment shall not come in direct contact with stainless steel except when attached to lifting lugs, eyes, or pads in order to avoid surface damage.
- n. All austenitic stainless steel and nickel base alloy materials shall be handled and stored in such a manner that they are not in contact with lead, zinc, copper, mercury, or other low-melting-point alloys or halogenated material.
- o. Personnel engaged in operating material handline equipment shall be competent and shall have demonstrated satisfactory ability in operating similar lifting equipment.

- 6.2 Special Handling Requirements--Detailed handling instructions and procedures shall be prepared for all items that require special handling instructions because of weight, size, susceptibility to stock damage, high nil ductility transition temperatures, or any other conditions that warrant special instructions. Such instructions or procedures shall be made available prior to the time the item is to be handled and shall give weights, sling locations, balance points, methods of attachment, maximum hoist line speeds, and other pertinent features to be considered as necessary for safe handling.

As a matter of routine the vendor normally specifies the need for any applicable special handling procedures or requirements. However, the originator of the purchase request shall evaluate the need for and specify, as applicable, any additional special handling procedures or requirements at the time of receipt inspection for Level I items. These procedures and requirements shall identify, as applicable, the need for special visual and nondestructive examinations and dynamic load tests for equipment and rigging such as cranes, forklifts, and cables. The result of special tests and inspections shall be documented.

7.0 SHIPPING

For items requiring shipment within TVA or back to the supplier for repair or modifications, the guidelines below shall apply.

7.1 Transportation Requirements

7.1.1 Open Carriers

Items requiring indoor storage shall be covered for protection from environmental conditions. Tarpaulins, when used, shall be fire retardant; and they shall be installed in a manner to provide drainage and to ensure air circulation to prevent condensate.

Barrier and wrapping materials subject to transportation damage shall be covered with waterproof shrouds such as tarpaulins, so that they are not exposed directly to the environment.

7.1.2 Closed Carriers

When times requiring indoor storage cannot be adequately protected from weather or environment on open carriers, closed carriers shall be used.

Use of fully enclosed furniture vans is recommended when shipping large delicate items such as control panels.

7.1.3 Special Shipments

For items requiring special care in shipping, the originator of the purchase request shall specify all special requirements for handling. Areas to consider shall include:

- a. Type of bracing
- b. Tie-down methods
- c. Temperature and humidity
- d. Any other special instructions

8.0 CONTROLLED ACCESS TO POWER STOREROOMS

8.1 General

Access to the storage area shall be controlled and limited to designated Power Stores personnel. Storage facilities shall be locked when not attended by Power Stores personnel. Nondesignated personnel entering the storage area(s) shall be escorted by Power Stores personnel. Precautions shall be taken against vandalism.

All nondesignated plant personnel and visitors entering the main Power Stores Unit or Power Stores Modification Unit shall sign the Power Stores Access Log, Attachment 6. Power Stores personnel shall have the responsibility for verifying that nondesignated personnel sign the access log. Access log sheets may be destroyed at the end of each 30-day period.

Outside storage area shall have a locked perimeter fence to provide access control. Nondesignated personnel entering the outside storage area(s) shall be escorted by Power Stores personnel.

8.2 Power Stores Unit

Designated and nondesignated personnel shall enter the Power Stores Unit by door #168 or door #180. The loading dock door shall not be used as access into the Power Stores Unit.

8.3 Emergency Access to Power Stores Unit

The following section shall be used only in an emergency and when Power Stores personnel are not on duty at the Power Stores Unit.

Emergency entrance to the Power Stores Unit is made by use of a key under the control of the duty shift engineer. The key is located in the Shift Engineer's Office in a locked box with a breakable glass front. The Power Storeroom supervisor has the key to the box and will make replacement of the cover glass after each emergency storeroom entry.

The key is for use only in emergencies where reasonable effort has been made and the shift engineer is unable to get in touch with a Stores employee, or it is considered to the best interest of TVA to obtain materials in less time than would be required if a Stores employee were called to the plant.

Use of the emergency key must be authorized by the duty shift engineer. If emergency entry is made, a storeroom requisition form 575 is to be prepared or a list of withdrawn materials provided the storeroom supervisor showing item, description, and stock and bin numbers.

9.0 SURVEYS

9.1 Periodic surveys of CSSC items and their storage facilities shall be performed and documented by the FQE Section to verify that the requirements of AI-36, Section 5.0 are being effectively implemented. Characteristics verified during this survey shall include the following items as appropriate:

- a. Identification and marking
- b. Protective covers and seals
- c. Coatings and preservatives
- d. Desiccants and inert gas blankets
- e. Physical damage
- f. Cleanliness

10.0 DOCUMENTATION

Power Stores QA Records are listed in AI-7, Attachment 5A and 5B.

Attachments:

1. Requirements for Megger and Polarization Checks on Motors.
2. Power Stores General Inspection Record
3. Power Stores Periodic Inspection/Maintenance of Stock Items
4. Power Stores Initial Inspection Maintenance Record
5. Additions or Changes to Storage Instructions
6. Power Stores Access Log
7. Power Stores Unit
8. Power Stores Modification Unit

Requirements for Megger and Polarization Checks on Motors

1. DC motors will be meggered with a 500-Volt megger. The minimum acceptable value shall be Ten megohms.
2. 480-Volt motors less than 100 horsepower will be meggered using a 500-Volt megger with the acceptable criteria the same as in Item 1.
3. 480-Volt motors and motor stators 100 horsepower or greater will be meggered using a 1,000-Volt dc megger for 10 minutes. The acceptance criteria will be the same as Item 1.
4. 4-kV and 6.9-kV motors and motor stators will be meggered with a 2,500-Volt dc megger for 10 minutes. The minimum acceptable value shall be 25 megohms. The polarization index will be calculated and must be greater than 1.75.
5. The field of generators and synchronous motors, except synchronous motors with brushless excitation, will be meggered with a 500-volt megger for 10 minutes if practical. The acceptance criteria will be the same as Item 1. The stator will be meggered to a value consistent with that given above for the applicable motor voltage. The acceptance criteria will also be the same for the voltage application.
6. Perform insulation and winding resistance tests in accordance with plant approved procedures.

POWER STORES GENERAL INSPECTION RECORD

1. Facility and storage area meet specified requirements for:

Storage Area _____

() Indoor controlled (per Section 5.6.1)

() Indoor (per Section 5.6.2) or

() Outdoor (per Section 5.6.3)

_____/_____
 Yes No

 Initials PSU

2. Stored Items Inspection Report

A random inspection of all listed categories of equipment shows that the "Storage Area", "Special Environmental Conditions", "Physical Storage and Packaging Conditions", and "Initial Equipment Preparation" requirements are being met.

The following conditions have been monitored and found satisfactory:

	*Acceptable		Initials PSU
	Yes	No	
a. Use of pallets	_____	_____	_____
b. Proper stacking or placement to prevent physical damage.	_____	_____	_____
c. Rodent or insect infestation of stored items	_____	_____	_____
d. Sources of corrosive dust or fumes	_____	_____	_____
e. Rust/corrosion of stored items	_____	_____	_____
f. Surface contamination of stored items	_____	_____	_____
g. Stainless steel parts contamination	_____	_____	_____
h. Integrity of dust covers and pump/valve opening covers.	_____	_____	_____
i. Identification tags in place	_____	_____	_____

POWER STORES GENERAL INSPECTION RECORD

* If unacceptable conditions are identified in Part 1 or 2 above, the condition and action taken shall be described below:

Unacceptable Condition(s)/Action Taken

Inspector _____ / _____
Power Stores Date

_____ / _____
Power Stores Supervisor Date

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POWER STORES PERIODIC
INSPECTION/MAINTENANCE OF STOCK ITEMS

ROUTING: Power Stores _____
Plant Services _____
Electrical/Mechanical/Instrumentation Maintenance _____

The items listed in the monthly printout for _____ (month/year)
have been inspected in accordance with the applicable instruction(s).

_____/_____
Supervisor Date

Information noted on printout has been updated and all items rescheduled for inspection.

_____/_____
Power Stores Supervisor Date .

POWER STORES INITIAL INSPECTION/MAINTENANCE RECORD

Equipment Name _____ TIIC No. _____
 Storage Location _____ Serial No. _____
 Storage Instruction _____
 Section No. _____

Item Identification (as applicable)

Manufacturer _____
 Size _____ Horsepower _____
 GPM _____ Volts _____
 Other _____ Full load amps _____

The following inspection/maintenance was satisfactorily performed.

1. Megger _____ / _____¹ _____ / _____¹ _____
 1 min 10 min 1 min 10 min 1 min 10 min Date

2. Polarization index _____
 _____¹ _____¹ _____
 Second Phase Third Phase Date

_____ / _____
 Signed Date

3. Shaft rotation _____

 Date

4. Gearing lubrication _____ / _____
 Checked Added Date

* Hold Point: QC Mech Inspector shall verify type and amount when lubrication is added.

* Verified by _____ / _____
 QC Mech. Inspector Date

* Bearing type _____ Lub. type _____
 _____ / _____
 Signed Date

5. Shelf life deterioration check _____

 Date

_____ / _____
 Signed

6. Other _____

 Date

* _____ / _____
 Signed Date

¹Applicable if phase windings meggered separately.

ADDITIONS OR CHANGES TO STORAGE INSTRUCTIONS

Addition _____ Change _____

TIIC No. and/or Contract No. _____
(provide if change or addition is for a specific item)

Reason: _____

Complete and attach page two and three of this form. If changing an existing instruction, also attach a copy of the previous instruction.

ITEM: _____

THIS INSTRUCTION ESTABLISHES THE MINIMUM REQUIREMENT FOR STORAGE AND PERIODIC INSPECTION AND MAINTENANCE

REFERENCES: _____

STORAGE AREA: _____

SPECIAL ENVIRONMENTAL CONDITIONS: _____

PHYSICAL STORAGE AND PACKAGING CONDITION: _____

INITIAL EQUIPMENT PREPARATION: _____

PERIODIC INSPECTION OR MAINTENANCE: _____

INTERVALS: _____

SPECIAL INSTRUCTION: _____

Approvals:

Originator

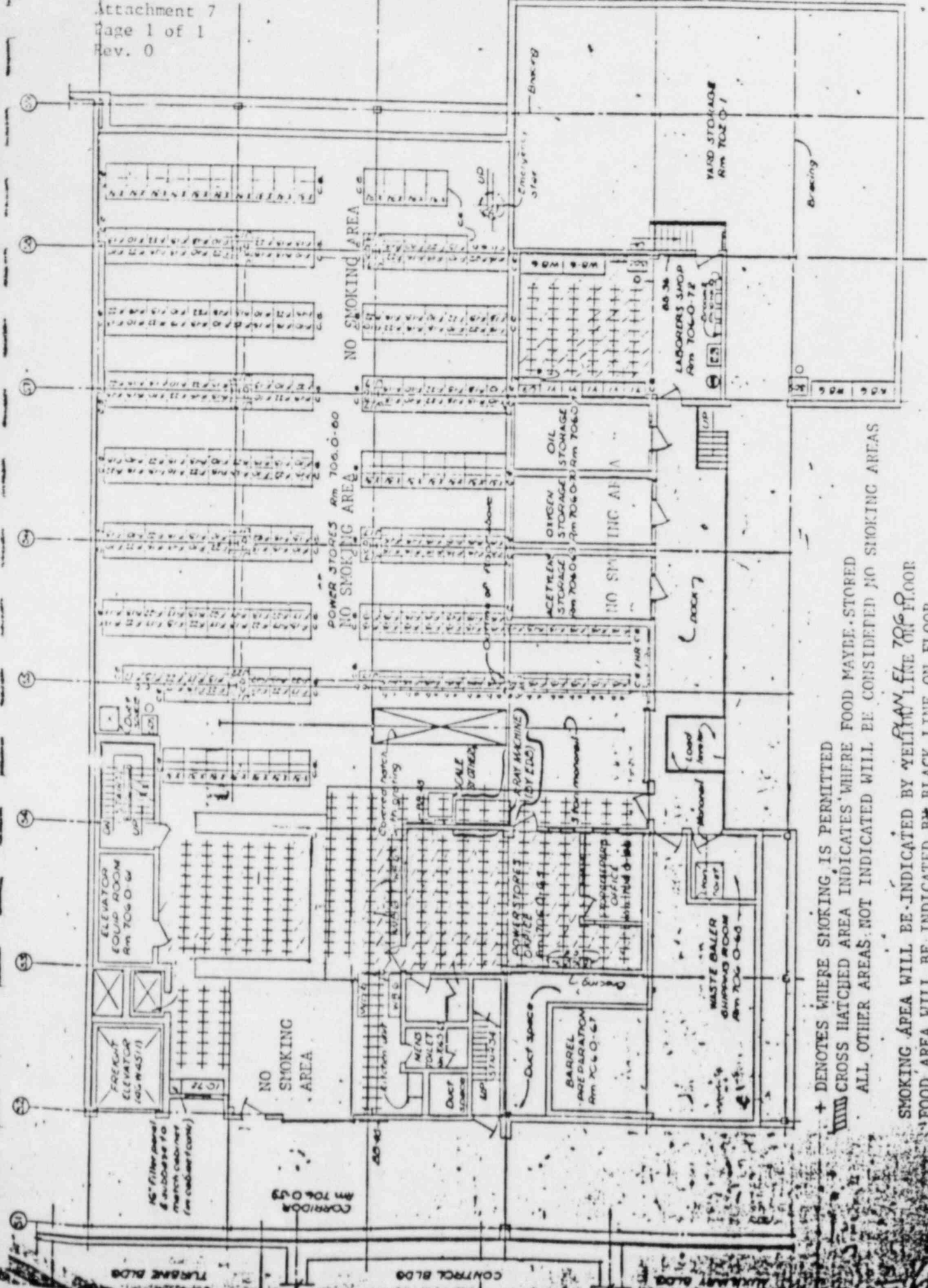
Maintenance Engineering
or Field Services Supervisor

Power Stores Supervisor

Field Quality Engineering
Section Supervisor

Return approved originals to Power Stores Supervisor.

POWER STORES UNIT



+ DENOTES WHERE SMOKING IS PERMITTED
 ▨ CROSS HATCHED AREA INDICATES WHERE FOOD MAYBE STORED
 ALL OTHER AREAS NOT INDICATED WILL BE CONSIDERED NO SMOKING AREAS
 SMOKING AREA WILL BE INDICATED BY YELLOW LINE TOP FLOOR
 FOOD AREA WILL BE INDICATED BY BLACK LINE ON FLOOR

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POWER STORES MODIFICATION UNIT

