

**NOT MEASUREMENT
SENSITIVE**

**DOE-STD-1071-94
June 1994**

DOE STANDARD

GUIDELINE TO GOOD PRACTICES FOR MATERIAL RECEIPT, INSPECTION, HANDLING, STORAGE, RETRIEVAL, AND ISSUANCE AT DOE NUCLEAR FACILITIES



**U.S. Department of Energy
Washington, D.C. 20585**

AREA MNTY

This document has been reproduced directly from the best available copy.

Available to DOE and DOE contractors from the Office of Scientific and Technical Information, P.O. Box 62, Oak Ridge, TN 37831; (615) 576-8401.

Available to the public from the U.S. Department of Commerce, Technology Administration, National Technical Information Service, Springfield, VA 22161; (703) 487-4650.

Order No. DE94014949

FOREWORD

The Guideline to Good Practices for Material Receipt, Inspection, Handling, Storage, Retrieval, and Issuance at DOE Nuclear Facilities provides contractor maintenance organizations with information which may be used for the development and implementation of a rigorously controlled material receipt inspection process for maintenance organizations at DOE (Department of Energy) nuclear facilities. This document is intended to be an example guideline for the implementation of DOE Order 4330.4A, *Maintenance Management Program* Chapter 11, Element 11, *Material Receipt, Inspection, Handling, Storage, Retrieval, and Issuance*. DOE contractors should not feel obligated to adopt all parts of this guide. Rather, they should use the information contained herein as a guide for establishing a material receipt, inspection, handling, storage, retrieval, and issuance process applicable to their facility.

CONTENTS

FOREWORD iii

1. INTRODUCTION 1

 1.1 Purpose 1

 1.2 Background 1

 1.3 Application 2

2. DEFINITIONS 3

 2.1 Acronyms 3

 2.2 Acceptance Tag 3

 2.3 Item 3

 2.4 Purchase Documents 3

 2.5 Q-List 3

 2.6 Shelf Life 3

 2.7 Storage Controls 3

 2.8 Storeroom 3

 2.9 Tickler File 3

3. MATERIAL RECEIPT, INSPECTION, HANDLING, STORAGE
RETRIEVAL, AND ISSUANCE 4

 3.1 Discussion 4

 3.2 Scope 4

 3.3 Responsibilities 5

 3.3.1 Maintenance Manager 5

 3.4 Guidelines 5

 3.4.1 Receipt Inspection 5

 3.4.2 Handling 7

 3.4.3 Storage of Material and Equipment 8

 3.4.4 Retrieval and Issuance 12

APPENDIX A EXAMPLE ACCEPTANCE TAG A - 1

APPENDIX B EXAMPLE INSPECTION CHECKLIST B - 1

APPENDIX C EXAMPLE TICKLER FILE C - 1

APPENDIX D SAMPLE LESSON PLAN D - 1

1. INTRODUCTION

1.1 Purpose

This guide is intended to assist facility maintenance organizations in the review of existing methods and in the development of new methods for establishing a material receipt, inspection, handling, storage, retrieval, and issuance process/system which ensures timely delivery of the proper parts and materials, in the condition required for effective maintenance activities, and periodic services which provide unique and/or supplemental maintenance support. It is expected that each DOE facility may use approaches or methods different from those defined in this guide. The specific guidelines that follow reflect generally accepted industry practices. Therefore, deviation from any particular guideline would not, in itself, indicate a problem. If substantive differences exist between the intent of this guideline and actual practice, management should evaluate current practice to determine the need to include/exclude proposed features. A change in maintenance practice would be appropriate if a performance weakness were determined to exist. The development, documentation, and implementation of other features that further enhance these guidelines for specific applications are encouraged.

Additional information pertinent to the implementation of this guideline may be found in DOE-STD-1070-93, *"Guideline to Good Practices for Procurement of Parts, Materials, and Services at DOE Nuclear Facilities."*

Appendix D (Sample Lesson Plan) is provided for use by facility trainers who provide training regarding this element of DOE Order 4330.4A, "Maintenance Management Program."

1.2 Background

The information in this guide was developed from commercial and DOE sources. Each facility should select any details applicable, add any additional knowledge or experience that is applicable, and then develop and implement facility-specific methods for establishing a material receipt, inspection, handling, storage, retrieval, and issuance process. Facilities which use existing documented methods should review this guide to identify any details which may enhance their existing process.

1.3 Application

The content of this guide is generally applicable to all DOE nuclear facilities. Portions of the methods outlined may not be applicable to all facilities, because maintenance organizations, disciplines, titles, and responsibilities may vary among DOE nuclear facilities. Facility maintenance personnel should (1) verify the adequacy of or (2) improve existing methods by adapting this guide to their specific facility and individual maintenance disciplines.

2. DEFINITIONS

2.1 Acronyms

DOE: Department of Energy

MSDS: Material Safety Data Sheets

RECID: Record Identification

- 2.2 Acceptance Tag. The final receipt inspection identifier affixed to an item prior to placing the item in storage. It indicates all purchase requirements have been met.
- 2.3 Item. Any spare part, consumable, equipment or material. May include entire component, valve, motor, instrument, gasket, adhesive, sea], etc.
- 2.4 Purchase Documents. Documents that describe the item(s) to be purchased. These include requisitions and purchase orders with equipment specifications and requirements.
- 2.5 Q-List. An engineered approved listing of safety class structures, systems, or components (SSC).
- 2.6 Shelf Life. A specific period or interval of time after which a stored item may not meet its original design specifications, quality, or manufacture requirements.
- 2.7 Storage Controls. Controls applied during purchasing, receiving, packaging, and storing of items to ensure that they are maintained properly.
- 2.8 Storeroom. Any facility designed or used for receiving, storing, and issuing items.
- 2.9 Tickler File. A file that serves as a reminder and is arranged to bring matters to timely attention.

3. MATERIAL RECEIPT, INSPECTION, HANDLING, STORAGE RETRIEVAL, AND ISSUANCE

3.1 Discussion

The fundamental objective of an effective material receipt, inspection, handling, storage, retrieval, and issuance process should be to ensure the integrity of parts, equipment, and material is maintained and verifiable from the time the item is received until it is placed into service by the owner/operator. This objective requires that appropriate controls be established to ensure that the quality of parts and material is not degraded during purchasing, receipt, storage, and handling. This guideline should not be limited to new purchases of materials and equipment, but should include all materials and equipment stored at the plant.

The plant process should clearly define responsibilities, accountabilities, and interfaces for each functional organization supporting each step in the process. Specific controls should be tailored to be consistent with the type, importance, and intended service of individual items.

A material control process should include the following elements:

- Appropriate requirements should be included in purchase documents on the basis of vendor information, material specifications, standards, experience, and plant environment.
- Ensure that cleaning fluids, solvents, and other chemicals are compatible with plant systems and equipment, and that special chemical requirements such as temperature, shelf life, hazard communications, and physical segregation are properly addressed.
- Ensure that storage controls are defined prior to purchase, that quality documentation is required for Q-list items, and that the receipt inspection process requirements are clearly addressed.
- Establish and maintain a file system (e.g., tickler file) to ensure that specific storage instructions are accomplished, preventive maintenance tasks are completed, and perishable items are replaced before their shelf life expires.
- Program effectiveness should be monitored periodically by supervisory inspection, and there should be appropriate tracking to correct deficiencies.

3.2 Scope

This guideline applies to material receipt, inspection, handling, storage, retrieval, and issuance activities involving maintenance organizations throughout.

3.3 Responsibilities

- 3.3.1 Maintenance Manager, accountable for maintenance of the facility, is responsible for evaluating status, determine and implement enhancements/improvements of material receipt, inspection, handling, storage, retrieval, and issuance activities.

3.4 Guidelines

3.4.1 Receipt Inspection

- 3.4.1.1 During receipt inspection, the designated organization should ensure that special storage instructions have been addressed. Prior to final acceptance of an item, the designated organization should ensure that the necessary purchase order instructions and requirements are completed such as the following:
- The tickler file has been updated as described in Section 3.4.3.20.
 - Appropriate items have been added to the preventive maintenance program.
 - Appropriate inspection instructions are clearly defined.
- 3.4.1.2 Inspection and test activities should be selectively and judiciously applied to new, repaired, and replacement items, on the basis of risk to safety and/or importance to reliable capacity, to ensure items will perform as expected.
- 3.4.1.3 Plant Engineering should develop a process for providing data sheets which form the basis for procurement of Safety Class Items and other major purchases (i.e., equipment and construction projects). These data sheets should provide:
- Procurement information
 - Establish critical parameters and their acceptance criteria
 - Specify unique or special testing requirements/methods
 - Reorder instructions
 - Suspect/counterfeit parts information

DOE-STD-1071-94

3.4.1.4 Items or parameter values which do not satisfy established acceptance criteria should be rejected or involve Plant Engineering approval for other disposition.

Non-conforming items should be:

- Clearly identified
- Segregated from normal items to prevent inadvertent use
- Documented on a Nonconformance Report and/or a Defective or Substandard Material Report
- Tracked and dispositioned as soon as practical by the applicable authority

3 4.1.5 Routine inspections performed by appropriate personnel should include:

- Ensuring that packaging is proper (as designated on the purchase order when specified), packaging is undamaged and/or not deteriorated
- Color, count, shape, size, part number, model number, manufacturer/vendor name, etc. are as specified on the purchase order
- Shelf-life and other time-environment requirements have not been violated - date and time of receipt are logged for regular follow-up review during the storage period
- Specified vendor documentation, in the quantities required by the purchase order exist

3.4.1.6 Special inspections should be performed on Safety Class Items and other items when designated by the requisitioner.

3.4.1.7 Special inspections should be performed by the organization specified on the requisition.

3.4.1.8 Special inspection requirements for items not involving Engineering data sheets should be defined by the requisitioner.

3.4.1.9 Special inspections normally require:

- Formal quality records of all measured data
- Date inspection performed
- The identification of the individual and the organization performing the inspection
- Accept/reject status identification
- The signature of the applicable authority to approve the status

3.4.1.10 Items receiving special inspection (especially Safety Class Items) should be appropriately identified and segregated from normal stock to indicate status and ensure proper application.

3.4.1.11 Materials and equipment which have been repaired and/or stored in the plant should require the same inspection defined for the original purchase and/or appropriate for its intended application as specified by engineering before becoming available for use or restock.

3.4.1.12 Stored items which are affected by time-environment should be regularly checked by designated personnel, expired or otherwise jeopardized items should be removed from normal storage until dispositioned by the proper authority.

3.4.1.13 An "Acceptance Tag" should be placed on the item after satisfactory receipt inspection. The tag should be legibly marked to indicate whether an item has any type of special storage requirements (see Appendix A for an example). This provides the user, requester, or storeroom personnel with an easy method to ensure special storage control requirements are satisfied. The tag may cross-reference a particular entry in a file system (tickler file) for further instructions.

3.4.2 Handling

3.4.2.1 Lifting equipment labels should be current and the maximum load capability, as marked on the equipment, should not be violated when handling or moving items.

3.4.2.2 Lifting equipment should be regularly tested, inspected, and acceptance tagged to ensure integrity.

DOE-STD-1071-94

- 3.4.2.3 Individuals required to operate cranes, forklifts, and other lifting equipment should be performance-based trained, and appropriately licensed to verify their qualification.
- 3.4.2.4 Unusual, unique, or deceptive weight, balance, lift points, and other critical information regarding items to be lifted or otherwise handled should require that clearly defined instructions or job plans be communicated to the handler.
- 3.4.2.5 Items which require special handling such as vibration isolation, protection from the environment, specific orientation, etc. to ensure integrity should require that clearly defined instructions or job plans be communicated to the handler.
- 3.4.2.6 Calibrated/certified items should be handled in a manner that ensures their integrity is not jeopardized.

3.4.3 Storage of Material and Equipment

- 3.4.3.1 A system should be established which ensures the proper storage, segregation, and control of hazardous materials such as;
 - Chemicals
 - Radioactive/reactive organics
 - Reagents
 - Explosives
 - Flammables/combustibles
 - Corrosives
 - Pesticide/herbicide
- 3.4.3.2 A system should be established which ensures the proper storage, segregation, and control of specialty equipment and tools.
- 3.4.3.3 A system should be established which ensures the proper storage, segregation, and control of general materials, equipment, and tools.

DOE-STD-1071-94

- 3.4.3.4 Material and equipment subject to restricted use and distribution such as Safety Class Items, critical spare parts, Bill-of-Material items, certain sealants and compounds, precious metals, etc. should have clearly defined instructions, which provide for:
- Segregation from normal stock
 - Access control
 - Unique identification
 - Issue only to those on authorized signature lists
 - Stock records maintenance
 - Purchase order tracking and ready traceability from design drawing through purchasing, storage, and handling, to installation
- 3.4.3.5 The quality of stored items should be maintained through the selective and judicious application of clearly defined protection and availability controls.
- 3.4.3.6 A system for the periodic general inspection of storage areas should exist. Typical storage control observations should verify the following:
- Corrosive chemicals segregated from sensitive equipment and metal items
 - Flammables in proper containers and marked
 - Radioactive substances properly shielded and marked
 - Stainless steel and other "pedigree" metals segregated from other metals (particularly carbon steel)
 - Motors, pumps, relief valves, and other items are stored on their bases
 - Stacking of items, crates, boxes, barrels, etc. do not exceed stacking recommendations
 - Packaging and seals have not been violated leaving contents exposed to degradation caused by the intrusion of foreign materials or environmental conditions

DOE-STD-1071-94

- Machined surfaces are left adequately protected
 - Applicable insect and rodent controls are in effect
 - Applicable shelf-life conditions are in effect
 - Carcinogens segregated from other materials and equipment
 - Re-order/restocking is clearly indicated
- 3.4.3.7 A system should exist which ensures that Material Safety Data Sheets record identification (MSDS RECID) are readily accessible to the user.
- 3.4.3.8 The process where regulatory requirements regarding storage and disposal of materials should be regularly verified to ensure compliance status.
- 3.4.3.9 When established, automatic reorder/restock criteria should be implemented.
- 3.4.3.10 Reorder/restock quantities should be reviewed and adjusted on the basis of;
- Lead-time
 - Usage (historical and projected)
 - Value-added or other established criteria
- 3.4.3.11 A shelf-life program should be developed which applies to items stored in warehouses and plants prior to end use. Shelf-life requirements should be specified for (but not limited to) the following types of items:
- rubber components
 - silicon sealants
 - certain paints
 - photosensitive chart paper
 - photographic material
 - certain pre-lubed bearings

DOE-STD-1071-94

- capacitors
 - resins
 - complete assemblies containing items listed above
 - chemicals, reagents, and organics
- 3.4.3.12 Certain items, such as electric motors with heaters, may be required to be energized continuously or periodically when stored in an uncontrolled environment.
- 3.4.3.13 Heavy equipment such as motors, gearboxes, and other prime-movers should be rotated periodically to maintain a proper coating of lubrication and to prevent bearing or gear-face denting at point of contact.
- 3.4.3.14 In addition to the controls of the general storage areas, temperature and humidity controls should be considered for individual item groups. It may also be necessary to change or monitor desiccants or to provide heaters.
- 3.4.3.15 Certain items such as gearboxes may be required to be filled with fluid.
- 3.4.3.16 It may be necessary to seal or cap components to the extent possible to prevent entry of foreign material, dust, or contaminants. Reinforced packing or barriers between items may be required to prevent damage or prevent mixing of chemicals due to leakage or breakage.
- 3.4.3.17 Periodic inspections should be made to ensure that the general condition of the storage area is acceptable. Examples include cleanliness, vermin control, lighting, preservation, labeling, flooding, fire protection, safety, and segregation of material, including segregation of reactive chemicals.
- 3.4.3.18 Items stored in the plant should be placed under the same type of controls used for the storeroom.
- 3.4.3.19 A monthly inspection of storage facilities and items should be performed. The inspection should be performed and documented utilizing a checklist that includes criteria appropriate to the inspection. Observed deficiencies should be noted and corrective action addressed prior to resolution of the checklist. (See Appendix B for an example of inspection checklist format.)

3.4.3.20 A tickler file system is one method which may be used to ensure that specific storage control instructions are followed.

- The system may be either manual (similar to a card file) or computerized.
- The tickler file should be organized by months of the year.
- Specific storage control instructions for individual items should be entered into the tickler file system by designated personnel. These instructions should be entered separately (either as a separate card or computer entry) and put in the appropriate month that the activity is to take place. As a minimum, additional information, such as part number, P.O. number, item description, and RECID should be included. (See Appendix C for examples.)
- Designated personnel should ensure that the particular storage control activities for the month are completed. (This may require assistance from other departments for activities such as rotating motors and functional tests.)
- Designated personnel should review the tickler file entries on a monthly basis for upcoming activities, e.g., 60-90 days. This review is in addition to the review and completion of storage control instructions for the particular month. This review is to ensure proper planning for certain activities and advance notification for assistance from other departments.

3.4.4 Retrieval and Issuance

3.4.4.1 A system should exist to ensure that items are identified and stored to facilitate ready retrieval upon approved request.

3.4.4.2 Items should be selectively and judiciously controlled, on the basis of their risk to safety and/or importance to reliable operations, during the interval between stores issue and installation to ensure intended traceability and/or integrity is not violated prior to installation.

3.4.4.3 Safety Class Items and other controlled items to be issued ONLY to individuals on authorized requester lists should be clearly defined in applicable documents.

DOE-STD-1071-94

- 3.4.4.4 Issuance documentation should be handled as quality records.
- 3.4.4.5 A system should exist which provides for current storage inventory status information to be maintained, to be made available to and usable by authorized individuals upon request.
- 3.4.4.6 Information on storage inventory lists which may enhance usability should include:
- Stores catalog number
 - Noun name
 - Manufacturer/vendor part number
 - Application and contact for controlled item disposition
 - Reorder criteria, when applicable
 - Quantity on-hand
 - RECID
 - Consideration for configuration managed items

APPENDIX A
EXAMPLE ACCEPTANCE TAG

APPENDIX A

EXAMPLE ACCEPTANCE TAG

The diagram shows a rectangular tag with rounded corners and a hole punch at the top center. The tag contains several horizontal lines for text entry. The labels on the left side of the lines are: ITEM, DATE, P.O., etc., etc., etc. A large, stylized 'S' stamp is drawn over the bottom half of the tag, overlapping the 'etc.' labels and the lines. Below the 'S' stamp, the word 'REF' is written diagonally.

If storage controls are necessary, the “acceptance” tag may restamped “S” with a transparent colored stamp.

APPENDIX B
EXAMPLE INSPECTION CHECKLIST

DOE-STD-1071-94
APPENDIX B
EXAMPLE INSPECTION CHECKLIST

OUTSIDE WAREHOUSE

INSPECTOR INITIALS/DATE	INSPECTION CRITERIA	COMMENTS & DEFICIENCIES	CORRECTIVE ACTION COMPLETED INITIAL/DATE
JB 3/9/82	1. <u>FLOODING</u> Ensure water has not entered storage areas and caused damage.	OK	
JB 3/9/82	2. <u>FIRE SPRINKLERS</u> Ensure storage of items does not reduce the effectiveness of the fire sprinklers.	OK	
JB 3/9/82	3. <u>DISTORTION OF ITEMS</u> Ensure that items are not damaged or distorted because of crowding or excessive weight.	Insulated damaged because of new desks.	Moved Desks JB 3/15/82

Note: Additional criteria to consider are as follows:

- | | |
|----------------------|---------------------------------------|
| Cleanliness | Protective covers |
| Safety Hazards | Tags in place |
| Fire extinguishers | Corrosion |
| Vermin control | Adequate Room |
| Leaking roofs | Colored wire protected from sunlight |
| Climate controls | Lifting equipment in proper operation |
| Locks in place | Dust and dirt |
| Temperature controls | Tickler file complete |

APPENDIX C
EXAMPLE TICKLER FILE

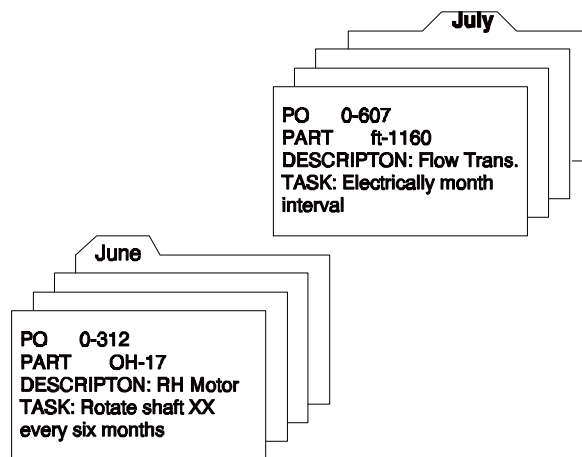
APPENDIX C

EXAMPLES OF TICKLER FILE INFORMATION

COMPUTERIZED METHOD

<u>MONTH/TASK # FOR MONTH</u>	<u>P.O. #</u>	<u>PART #</u>	<u>DESCRIPTION</u>	<u>TASK</u>
06-20	Q 207	EZ 12	F. D. Cylinder	Check gas pressure greater than 1000 psi every six months
06-27	Q 312	OH 17	R. H. Motor	Rotate Shaft XX degrees every six months
09-13	Q12	Z-30	F. T. Gasket	Shelf life expires September 1989
12-2	Q 312	OH 17	R. H. Motor	Rotate Shaft XX degrees every six months

NOTE: Computer printout may be used as a check-off and filed with records with comments.



CARD FILE should be organized by month. Appropriate personnel should check for tasks that are due for the particular month and in the next several months.

**APPENDIX D
MATERIAL RECEIPT, INSPECTION, HANDLING,
STORAGE, RETRIEVAL, AND ISSUANCE
SAMPLE LESSON PLAN**

APPENDIX D

MATERIAL RECEIPT, INSPECTION, HANDLING,
STORAGE, RETRIEVAL, AND ISSUANCE

SAMPLE LESSON PLAN

LESSON PLAN

1. The instructor should be familiar with the following background information:

The proper care of parts, materials, and equipment is required from the time an item is received until it is installed. Numerous site personnel and organizations are involved in this process. A program should be in place for the correct processing of material so that it is easily retrievable and usable when issued.
2. To teach this lesson, the following training housekeeping items are required:
 - a. Location for the training,
 - b. Approximately 30 minute time period for the training,
 - c. Notification of selected employees, and
 - d. A copy of the site's applicable program for material receipt and issuance.
3. This lesson has the following trainee enabling objective:

Explain the key elements of material receipt, inspection, handling, issuance, and storage.
4. Important aspects of receipt, inspection, handling, storage, retrieval, and issuance include the following:
 - a. When material is received at the facility it should be inspected and verified to meet the specifications of the original purchase documentation. Critical material should be segregated from non-critical, and any nonconforming material should be tagged and set aside to prevent inadvertent use. Additionally, a method should be developed to accept site repaired material.
 - b. Special handling procedures should be established for relocating materials and equipment. Personnel required to operate cranes, fork-lifts, and other lifting equipment should be properly trained and qualified.

DOE-STD-1071-94

- c. Material should be stored to maximize protection and availability. Additionally, periodic changes of desiccant, rotation of pump shafts, oil changes, and other preventive maintenance requirements specified by the vendor should be performed.
 - d. Periodic inspections of store rooms should be performed to ensure the following:
 - corrosive chemicals are segregated and not located near equipment and metal stock,
 - flammable materials are properly stored,
 - radioactive materials are properly controlled,
 - relief valves, motors, and other equipment are stored on their bases,
 - machined surfaces are properly protected, and
 - equipment internals are protected from intrusion of foreign materials.
 - e. A catalog for parts, materials, and equipment should be developed to allow plant personnel to determine what is available for issue. This catalog should provide a cross-references listing that provides information such as the manufacturer part number, facility part number, noun name, and component or system for which the part is used.
5. Discuss with the trainees the site's material receipt and issuance program.

DOE-STD-1071-94

CONCLUDING MATERIAL

Review Activity:

<u>DOE</u>	<u>Field Offices</u>
FM	AL
DP	CH
EH	ID
EM	NV
ER	OR
NE	RL
NS	SR
RW	OAK
	RF

Area Offices

Amarillo
Brookhaven
Fernald
Kansas City
Kirtland
Princeton

Facilities

ANL
KC AlliedSignal
NBL
LBL
LANL
LLNL
ORAU
PANTEX M&H
PNL
PPPL
RF-EG&G
SNL
NV REEC_o.
NV EG&G
OR OSTI
WHC
ID-EG&G
RF
SLAC
WSRC

Preparing Activity:

DOE-EH-63

Project Number:

MNTY-0011