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Maintenance Implementation Plan for T Plant

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1.0 EXECUTIVE SUMMARY

This Maintenance Implementation Plan (MIP) has been developed for maintenance functions associated with the T Plant facility complex located in the 200 West Area of the Hanford Site in south central Washington State. The objective of the MIP is to describe how the T Plant facility will implement the requirements established by DOE Order 4330.4B, *Maintenance Management Program*, Chapter 2.0, "Nuclear Facilities" (DOE 1994). The plan provides a blueprint for a disciplined approach to implementation and compliance. Each element of the Order is prioritized, categorized, and then implemented. The priority by which each item is to be implemented was accomplished via the following methodology:

PRIORITY 1

Those elements that must be accomplished first in order to provide the critical infrastructure on which to build a successful program. These elements include, but are not limited to, administrative and technical policies and procedures, training requirements, the planning, scheduling and control and calibration of Measurement and Test Equipment (M&TE). These elements and related sub elements are described in detail in Section 4.0 of this MIP with a schedule for accomplishment in Section 6.0.

PRIORITY 2

Those elements that require the implementation of one or more of the Phase I elements and/or completion of other actions by functions such as Plant Engineering and Quality Assurance. These elements are discussed in general in Section 4.0 and are identified for future action in Section 6.0.

PRIORITY 3

Those elements that require completed actions in Phase I and II, and additional actions for implementation criteria by completing actions in Phases I and II. These elements are also generally discussed in Section 4.0 of the MIP and are identified on the schedule in Section 6.0.

In addition to the elements described in Chapter 2.0 of the Order, the MIP also addresses how the Graded Approach to Maintenance will be used. Section 3.0 of the plan separates facility structures, systems, and components into four separate categories: safety, process, facility systems not related to safety or the process, and other parts of the facility infrastructure. Section 3.0 describes the level of detail that must be applied to each of the categories and the priority that must be assigned to preventive and corrective maintenance related to these categories. It also describes the process used to determine the category assigned to structures, systems, and components.

In conclusion, the MIP provides a formal plan for implementation of DOE Order 4330.4B (DOE 1994). It is a living document that will be revised as appropriate to provide a tool for tracking and measuring progress toward implementation and compliance.

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2.0 INTRODUCTION

T Plant administration comprises the T Plant facility complex located in the 200 West Area. This Maintenance Implementation Plan (MIP) addresses maintenance relative to the T Plant facility. It includes all maintenance activities performed within T Plant structures and facilities. Physical structures, systems, and processes, as well as all associated equipment specifically assigned to these groups, are also incorporated in this MIP.

2.1 T PLANT FACILITY COMPLEX DESCRIPTION: MISSION, HISTORY, AND FUTURE

The T Plant facility complex consists of 221-T, 271-T, 277-T, 291-T, 214-T, 211-T, 221-TA, 292-T, 2715-T, 2706-T, MO-909, MO-892 and other small storage buildings. Of these buildings there are three major facilities, 221-T, 271-T, and 2706-T, each with different intended functions:

- 221-T facility, intended uses:
  - High-dose and alpha contaminated radioactive decontamination of materials, including equipment
  - Rail car certification and decontamination
  - Storage of reactor fuel, and contaminated equipment
  - Decontamination/Calibration of instrumentation

- 271-T facility, intended uses:
  - Administrative facilities
  - Fabrication of environmental monitoring equipment
  - Maintenance Shop and material(s) control

- 2706-T facility, intended uses:
  - Low-level radioactive decontamination of materials, including equipment
  - Verification and repackaging of generator wastes.

T Plant facilities are in full operation with equipment being shipped for treatment either in the 221-T canyon or in 2706-T. Rail car certification and canyon deck clean-up/decontamination continues in the T Plant canyon and tunnel and environmental monitoring equipment fabrication, maintenance, and administrative functions takes place in the 271-T building.

2.1.1 221-T

The T Plant 221-T facility is a four-story concrete building approximately 274 m long and 21 m wide (900 ft long and 70 ft wide). It was constructed between 1943 and 1944 to perform extraction of plutonium and uranium from spent reactor fuel, and in 1957 was placed in service as a beta-gamma decontamination facility. In 1979, one of the 221-T cells was modified to contain and monitor 72 irradiated fuel elements from the Shippingport, Pennsylvania, PWR Core II. The majority of T Plant activities were curtailed by T Plant management in February 1991 and a facility recovery plan was developed to continue decontamination activities.

The facility is used to perform high-dose radioactive decontamination procedures on various equipment, etc., collected on a sitewide basis, as well as limited low-level decontamination. The 221-T rail tunnel is utilized to certify rail cars are transferred into the facility and pressure-tested to assure compliance with U.S. Department of Transportation (DOT) requirements. The 72 fuel elements are stored within the 221-T facility.

2.1.2 271-T

The 271-T portion of the T Plant facility complex is a relatively small wing of the 221-T building used to house administrative and shop functions. It contains maintenance shops and health physics operations that support the T Plant and Solid Waste complexes, performs environmental monitoring equipment fabrication, and houses solid waste operations. Maintenance activities performed in 271-T include preventive, corrective, and material control.

2.1.3 2706-T

The 2706-T facility is a "Butler"-type building, with access for large equipment/vehicles via roll-up doors. This building was constructed in the mid-1950s and was designed as a low-level decontamination facility. It has a roadway vehicle station and railway station and has pits in which solutions generated during decontamination activities are collected. 2706-T also has a small equipment decontamination station and shop space that will be used for maintenance activities.

The mission of 2706-T is to provide the Hanford Site with low-level decontamination services for railroad rolling stock (i.e., tank cars), roadway vehicles, transport casks, and other large equipment that can be trailered, tools/small equipment, and masks. The decontamination processes will consist of steam cleaning, ice blasting, vacuum blasting, using pressurized water spray with detergents or other decontamination solutions or whatever other technology is relevant. There is a significant equipment backlog of equipment ready for low-level decontamination. In recent months an additional mission has been added to verify and repackage generator waste containers.

3.0 DOE ORDER 4330.4B REQUIREMENTS IN ADDITION TO THOSE STATED IN CHAPTER II

3.1 IDENTIFICATION OF STRUCTURES, SYSTEMS, AND COMPONENTS INCLUDED WITHIN THE MAINTENANCE PROGRAM

The Maintenance Program for T Plant includes all facilities, systems, and equipment as defined in Section 2.0 of this Plan. Structures, systems, and components are identified in various facility documents (e.g., final safety analysis reports, master equipment list, safety equipment list) and/or subsets of these documents. The level of maintenance and overview required to perform maintenance is identified by the safety designation assigned to the structure, system, or component. When no such documentation exists, Engineering will make determinations based on established parameters. Currently, facility documentation of this type is less than adequate. Master equipment lists are not complete. Interim safety equipment lists have been developed and are in use. Action is in progress to resolve these issues. The "As-Built" drawing program is complete with drawing updates continuing to keep drawings current.

The program not only addresses maintenance required during initiation of facility operations/upgrades, but also includes maintenance for all current and future programs to be implemented.

Currently preventive maintenance (PM) is performed under the PM system, which defines maintenance for specific equipment and how often it will be performed, and the Component Based Recall System (CBRS), which defines installed instrumentation calibration activities and other maintenance performed under a recall system. Corrective maintenance is also being performed and has a substantial backlog. Priority on corrective maintenance is given to safety concerns first and second to production-related items.

3.2 SYSTEMATIC ANALYSIS DESCRIBING SYSTEMS/COMPONENTS INCLUDED WITHIN THE PREVENTIVE MAINTENANCE PROGRAM, AND DETERMINATION OF FREQUENCY OF MAINTENANCE ACTIONS

An effective PM program is an essential part of an efficient, cost-effective maintenance program. A systematic analysis of each system and component has been performed to determine the value added by performing or not performing PM as specific systems and components. This analysis has taken into consideration the consequence of failure, safety and environmental concerns, and the cost of performing PM rather than letting the system or component run until failure. This process is performed on all new equipment installations.

The frequency at which PM is performed has been established taking into account similar considerations as above. Frequencies have been established using manufacturer's data considering equipment history, engineering judgment, and safety requirements established for the specific system or component. Frequencies are determined by engineering judgment.

The PM program allows for periodic review, check, and calibration of equipment. The predictive maintenance program is being established on the Hanford Site in an effort to reduce preventive/corrective maintenance programs and consists of monitoring critical equipment bearing temperatures and vibration. This program has not yet been implemented at T Plant and it is yet to be determined if this program is necessary.

As the decontamination process at T Plant is further defined, it is anticipated that the long-term future will include extensive expansion in all areas. This maintenance program requirements are flexible to include new maintenance procedures and equipment with little or no overall changes.

3.3 SELF-ASSESSMENT PROGRAM

Continuing self-assessments and external audits have indicated that T Plant's overall condition considering Conduct of Operations, Occupational Safety and Health Administration (OSHA) compliance, facilities/equipment, and solid and liquid waste inventories are satisfactory with only minor concerns.

All strategies for the long-term decontamination mission at T Plant incorporates both operational and maintenance requirements. Engineering studies to define decontamination improvements include a detailed analysis of maintenance requirements for new equipment.

T Plant has continued to improve as indicated by the ongoing self-assessments program. These self-assessments included management inspections of facilities and inspections/audits performed by other internal organizations. Day-to-day monitoring of maintenance is performed by maintenance supervisors and work control organization(s); external audit and oversight of maintenance activities is also performed.

3.4 GRADED APPROACH TO MAINTENANCE

The graded-approach strategy for the T Plant facilities is focused on the timely and judicious application of maintenance resources in a manner designed to minimize and reduce risk. This strategy is developed along two parallel paths:

- One path is focused on a graded approach application of the significant issues of the T Plant facilities in comparison to the program elements of Chapter II. The process used is based on a managerial and operational weighted analysis (graded approach) of the requirements described in Chapter II. Each element of Chapter II will be assessed through the MIP process to assure that program requirements established for T Plant meet the objectives of DOE Order 4330.4B (DOE 1994).

- The other path is an approach directed at equipment categorization. This element of the graded approach catalogs all

equipment and systems within the T Plant facilities into four categories that are described as follows:

CATEGORY I: Safety Systems, Safety Class Items, and Related Equipment identified by Engineering on an available Interim Safety Equipment List (SEL).

A. Failure to preserve and restore this vital equipment/systems in a timely and quality manner could result in serious threat to the health and safety of plant personnel and/or the public.

B. The highest degree of work site supervision, craft skill, and written guidance are applied to all maintenance work in this category.

C. MIP resources emphasizing failure prevention are dedicated to these pieces of equipment and systems.

CATEGORY II: Production-Related Systems and Equipment

A. Failure to adequately preserve and restore in a timely manner the equipment and systems in this category could result in economic delays in production, damaged equipment, and/or affect the facility mission.

B. A high degree of work-site supervision, craft skill, and written guidance are applied to maintenance work in this category. Decisions are based on sound engineering judgment.

C. Selected MIP program resources emphasizing failure prevention and reduction are applied to these pieces of equipment and systems that have high a replacement cost or have a major impact on the facility mission.

CATEGORY III: Facility Support and Related Systems

A. Failure to satisfactorily preserve and restore in a timely manner the equipment in this category could have minor impacts on facility operations.

B. The degree of work-site supervision, craft skill, and written guidance applied to maintenance work in this category will be limited by the complexity of the work being performed.

C. Limited MIP resources emphasizing failure prevention and reduction are applied to these pieces of equipment and systems.

CATEGORY IV: Facility Preservation

A. Failure to satisfactorily preserve and restore in a timely manner the equipment in this category could have minimal impacts on the facility.

B. The degree of work-site supervision, craft skill, and written guidance applied to maintenance work in this category will be limited by the need and urgency of the work and its effect on the facility.

C. Limited MIP resources emphasizing the preservation requirement of the facility.

An engineering risk analysis and assessment is the formal basis for the categorization of equipment and systems. The process of equipment and system category assignment is formulated in the following four parts:

- **PART I:** Physically inventory all equipment and systems (e.g., master equipment list [MEL]) for the T Plant facility. This process provides the database for the total equipment population involved in the graded approach analysis.

- **PART II:** Initiate the engineering risk analysis on equipment contained in the T Plant facility MEL. Limited risk analysis is currently available through Facility Safety Analysis Reports (SAR) SD-CP-SAR-007. However, these reports lack the depth and detail necessary to perform an adequate risk analysis. Additional risk analysis is currently being developed through the ongoing SAR upgrade process. The effort to develop a MEL is currently unfunded. An initial MEL is being developed which will be inclusive to all major equipments and safety equipment.

- **PART III:** To be performed concurrently with the inventory and risk analysis to provide an interim graded approach to categorization until each formal risk analysis is completed. The importance of this part cannot be underplayed, since it provides the ongoing, day-to-day maintenance capability, while a parallel path is generating the formal documentation through the FSAR upgrading process. The interim analysis is based on sound engineering principles that are overviewed by Safety (Industrial, Nuclear and Environmental) and Quality Assurance. This interim categorization is then used as the graded approach mechanism until each individual risk analysis and assessment is completed in the FSAR upgrade program. As each system or piece of equipment is formally assessed, its interim status is updated as indicated by the risk assessment.

- **PART IV:** The fourth part is a program process whereby future T Plant facilities equipment/system additions or modifications are assessed and added to the MEL before operational turnover.

3.4.1 Strategy for Safety-Related Items

System and equipment Safety Classifications and Risk Categories are assigned in accordance with established Westinghouse Hanford Company (WHC) procedures and criteria. These classifications support a graded approach to maintenance activities, which include assignment of levels of review and approval, work control, procedural detail, documentation, oversight, and verification. The philosophy for assignment of work priorities and allocation of resources to plant work is for correction of discrepancies having priority over enhancements.

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4.0 DOE ORDER 4330.4B CHAPTER II REQUIREMENTS

As shown in the Chapter 1.0, Executive Summary, the improvement actions specified in this section of the MIP are not designed to immediately convert the T Plant facility maintenance program to the level described in DOE Order 4330.4B (DOE 1994), but rather to initiate the step changes required for compliance. Using a weighted analysis (graded approach), the 18 elements of DOE Order 4330.4B, Chapter II, have been put in one of three phases of implementation (DOE 1994). Safety, operational significance, and resource availability were among the factors for phase determination. Immediate across-the-board application of all portions of the order would overburden existing resources and commitments, in turn potentially jeopardizing personnel and environmental safety. The MIP provides a method for continued and sustained improvement. The application of self-assessments and corrective action activities referenced in Section 3.0 of the MIP will be used to monitor and update the plan.

4.1 MAINTENANCE ORGANIZATION AND ADMINISTRATION

The organization and administration of the maintenance function should ensure that a high level of performance in maintenance is achieved through effective implementation and control of maintenance activities.

4.1.1 Maintenance Organization Policies

Objective: Develop and implement a hierarchy of policies and procedures that specifically address maintenance programs. These policies will define the relationship between facility policies and maintenance, policies and implementing procedures, and the roles and responsibilities of organizations and positions as they relate to the maintenance program.

Discussion: General policies and goals, including maintenance-specific charters for the 200 Area, are available. Policies and procedures are presently relayed to employees through formal and informal training, staff/safety meetings, and required reading programs.

Improvement: No improvement is required.

4.1.2 Maintenance Strategy

4.1.2.A. Working Relationships

Objective: Develop an integrated approach to maintenance so that working relationships are defined among organizational groups supporting the maintenance function, including responsibilities, authority, and accountability.

Discussion: Working relationships among supporting groups are defined, and responsibilities are identified. Lines of authority and accountability among groups (Safety, Quality Assurance, Security, Training, Operations, and Maintenance) are also outlined.

Improvement: No improvement is required.

4.1.2.B. Long-Range Planning

Objective: Establish a scope of long-range major activities in order to effectively plan management of funding and staff resources.

Discussion: Long-range planning, Level IV scheduling, is performed by program management, work control, and Production Control and is documented in Level IV schedules and program plans.

Improvement: No improvement is required.

4.1.3 Staffing Resources

Objective: Maintain a sufficient staff of qualified maintenance personnel. Maintenance management will establish criteria for selection, training, qualification, and how the personnel will be used.

Discussion: Required staffing levels are determined by approved work scope. Maintenance management is responsible for selecting personnel, establishing training requirements, and establishing the qualification requirements. In addition, they define how personnel will be used. T Plant is in compliance with the intent of the Order.

Improvement: Current manning requirements are in a state of flux while the mission of decontamination on the Hanford Site is further defined. As this process is completed, manning documents will be modified to meet established requirements.

4.1.4 Goals and Objectives

Objective: Develop and maintain goals and objectives for the maintenance program that are achievable and measurable. Measure performance and effectiveness to these goals and objectives in a manner such that the information obtained can be used for further improvement. Ensure that goals are flexible, providing for adjustment if conditions change.

Discussion: Goals and objectives have been established and are documented through performance indicators, charts and Level IV schedules for the maintenance program. These goals include the following: Upgrades to the job control system, maintenance training, procedure upgrades, cost-effective

spare parts program, upgrades to T Plant equipment, PM/CBRS tracking, maintenance backlog tracking and improved material control. These goals are realistic and achievable. The current system will permit adjustment of the expectations if conditions change in the process of improving the program. T Plant is in compliance with the intent of the Order.

Improvement: No improvement is necessary.

4.1.5 Accountability

Objective: Ensure that all maintenance personnel understand and acknowledge their personal level of accountability and that expectations have been well communicated and understood by all. Good and substandard performance is recognized with immediate corrective action being taken for substandard performance. Corrective action for substandard performance should be positive in order to foster improvement.

Discussion: Employee meetings, as well as staff and unit level meetings, are conducted routinely to communicate expectations and foster accountability at all levels. Systems are in place for the recognition of performance. Regular performance evaluations and other appraisals are performed to ensure that personnel are appropriately recognized for accomplishments and any personnel problems are identified and remedied.

Improvement: Continued monitoring of these programs is necessary to maintain accountability. No improvement is required.

4.2 TRAINING AND QUALIFICATION OF MAINTENANCE PERSONNEL

A maintenance training and qualification program consistent with DOE Order 5480.18A, *Accreditation of Performance-Based Training for Category A Reactor and Nuclear Facilities* (DOE 1991a), and 5480.20A, *Personnel Selection, Qualification, Training, and Staffing Requirements at DOE Reactor and Non-Reactor Nuclear Facilities* (DOE 1994b), is being implemented to develop and maintain the knowledge and skills needed by maintenance personnel to effectively perform maintenance activities.

4.2.1 Responsibilities

Objective: The maintenance organization is responsible and accountable for determining the training needs of each individual in the maintenance organization. The training organization identifies existing programs, develops new training programs, and presents the training using in-house personnel or vendor-supplied personnel when appropriate.

Discussion: The training responsibilities of the maintenance and training organizations are well understood. Adequate policies and procedures are being developed along with an effective training and qualification program.

Improvement: Continue working with Training Branch personnel to develop and monitor an effective training program.

4.2.2 Maintenance Training Programs

Objective: Training for maintenance personnel, craft personnel, their supervisors and managers, and planning and material personnel are well-defined and developed to improve the knowledge and skills necessary to perform assigned maintenance job functions.

Discussion: Training of specifically skilled craft maintenance personnel, supervision, and other support personnel is presented in WHC documentation, and programs are designed to ensure that personnel are appropriately trained to provide the highest quality work. Plant-specific training is lacking in some areas. Reevaluation of training programs is ongoing to ensure that DOE Order and maintenance-specific requirements are achieved.

Improvement: Improve plant-specific training by adding to current training staff and developing a program for plant-specific equipment. T Plant is in compliance with the intent of the Order.

4.2.3 Training Schedules and Support

Objective: Training shall be coordinated in such a manner that permits maximum impact from the training with minimal impact on the facility. Maintenance training requirements shall be documented in formal procedures addressing specific work descriptions. There will be no exemptions from these requirements. Qualified facility instructors will be used to support facility-specific training.

Discussion: General schedules and requirements to establish specific T Plant training are included in reference documents, and T Plant personnel are trained following coordinated schedules. The specific needs to document T Plant-specific training and scheduling has been identified and is in progress.

Improvement: Continue monitoring the T Plant training program to include maintenance-specific training, scheduling, and evaluations.

4.2.4 On-the-Job-Training (OJT)

Objective: Maintain an OJT program with defined objectives, a formal qualification criteria, and demonstrated competence of the person receiving training. Successful completion of OJT will be documented in the site training record system. All on-the-job will be provided by qualified OJT instructors, with supervisors being responsible and accountable to ensure that all employees receive required OJT.

Discussion: A formal, OJT training program is an integral part of the training program under development. OJT will be accomplished per that training plan.

Improvement: Continue monitoring the T Plant training program to include maintenance-specific training, scheduling, and evaluations.

4.2.5 Qualification

Objective: Develop a program that will establish the qualifications for persons working on specific pieces of equipment. These qualifications will also apply to contractor personnel performing maintenance work. Maintenance management will review employees' training prior to work assignment to a given task to verify that all maintenance personnel are adequately qualified and/or certified.

Discussion: This program is included in the T Plant maintenance training program that is currently under development. Requirements are being developed and a training matrix will identify specific equipment requirements. Presently craft-specific qualification is required for each craft position. This ensures that personnel are qualified to perform job-specific tasks, meeting safety and quality requirements. Procedures are also in place that describe minimum qualifications for contractor personnel.

Improvement: Continue with development of the all inclusive maintenance training program with implementation by the end of FY95.

4.2.6 Training In Root Cause Analysis

Objective: A select technical maintenance group/team is schooled in principles and methods of root cause analysis. Group members should be trained in various approaches to cause-and-effect analysis and should be given the background necessary to select and implement an approach that is suitable for a particular situation.

Discussion: All division/department managers are required to have sufficient personnel on staff who are trained in root cause analysis; however, qualifications, methods of selection, and

specific training for these personnel are not identified. T Plant Maintenance will utilize the Engineering COG Engineers for root cause analysis determinations.

Improvement: Maintain training status of COG Engineering staff in root cause analysis.

4.2.7 Training Program Approval, Effectiveness, and Feedback

Objective: The maintenance manager should be directly involved in periodically reviewing, making recommendations for improving, and approving the maintenance training program. Performance indicators are established; trainee feedback and performance trends are utilized to evaluate effectiveness of the training program.

Discussion: WHC performance indicators, such as evaluation of accident frequency, backlogs, skin contamination, etc., are evaluated and reported frequently (monthly, quarterly) as part of the Operations Excellence program. These data are used to evaluate the effectiveness of maintenance training programs. Feedback systems have been implemented and provide personnel with a forum to voice their concerns. T Plant is in compliance with the intent of the Order.

Improvement: Continue to evaluate the feedback received from various courses of instruction and make an effort to improve the training.

4.2.8 Management and Supervisory Training

Objective: Formalized training programs are established to develop and maintain management and supervisory skills. Training should include position-specific technical areas as well as generic management skills to prepare supervisors for assigned responsibilities. Career progression planning should be used to help customize the training program.

Discussion: A training program is in place for supervisors, managers, and certain technical personnel. Supervisor training is continually reviewed and requirements updated and included in the Solid Waste Division training Matrix. Maintenance-specific supervisor training is also required, and training specific to T Plant area supervisors is currently under evaluation. T Plant is in compliance with the intent of the Order.

Improvement: Improvement is ongoing as an integral part of the training evaluation programs.

4.3 MAINTENANCE FACILITIES, EQUIPMENT AND TOOLS

This section of the MIP describes how T Plant Maintenance ensures that maintenance facilities, equipment, and tools efficiently support facility maintenance and maintenance training.

4.3.1 Facilities

4.3.1.A. Shops and Satellite Work Areas

Objective: The objective of this element is to obtain and maintain adequate facilities to support the maintenance infrastructure. This includes adequate shop space to support projected staffing along with planned increases in stationary shop equipment, discrete equipment storage, and staging areas capable of supporting day-to-day operations. Adequate office areas to support managers, supervisors, individual contributors, and clerical staff are also part of this element. Offices are to be adequately equipped with computers, fax machines, and copy machines, to efficiently support the maintenance program.

Discussion: The T Plant maintenance shops have been recently renovated to remove radiological concerns. There is not sufficient space to house all craft personnel which requires some craft to have shops in sub-standard spaces. Office space for maintenance first-line supervision, engineers and managers is available, and conditions are improving. Good housekeeping practices are followed and inspections of maintenance facilities are performed. These shops have no growth potential due to the dimensions of the building. Storage for shop material lacking in all areas and requires improvement.

Improvement: Permanent shop areas that are in compliance with the Order will be established that are safe, efficient, of sufficient size, and convenient. Improvements include designing and building new maintenance facilities with storage facilities for T Plant maintenance personnel. New facilities will meet all OSHA and other governing requirements. These items will be implemented when funded.

4.3.1.B. Laydown and Staging Areas

Objective: A plan for identifying and using maintenance laydown and staging areas has been developed, including responsibility for area upkeep and control.

Discussion: T Plant has planned for appropriate laydown and staging areas and is in the process of establishing those areas.

Improvement: Permanent and temporary laydown and staging areas are being established as requirements dictate.

4.3.1.C. Storage Facilities

Objective: Suitable storage is provided for tools, supplies, and maintenance equipment; environmental controls are considered.

Discussion: T Plant is developing a program to store necessary maintenance tools, equipment and supplies. This will include storage within 271/221-T as the fire loading permits and storing in outside locations as the storage units are available. Permanent storage areas will be designated in the new maintenance facility discussed in 4.3.1.A.

Improvement: Permanent storage facilities for tools, supplies, and maintenance equipment will be provided as funding permits.

4.3.1.D. Temporary Facilities

Objective: Temporary facilities for activities involving airborne radioactivity and contamination control afford safe and efficient working and operating conditions.

Discussion: Procedures require safe and efficient working and operating conditions for all work space, but are not applicable to T Plant because only permanent facilities for airborne radioactivity and contamination control are used. T Plant is in compliance with the intent of the Order.

Improvement: No improvement is required.

4.3.1.E. Decontamination Facilities

Objective: Suitable facilities and methods are available to decontaminate tools and equipment.

Discussion: T Plant has established guidelines and facilities to ensure tools and equipment are appropriately cleaned before they are returned to storage for future use. T Plant is in compliance with the intent of the Order.

Improvement: No improvement to ongoing plans is required.

4.3.2 Tool and Equipment Storage

Objective: Centrally located storage facilities are available, accessible, and of appropriate design for segregation, calibration, and repair of maintenance tools and test equipment.

Discussion: Limited storage facilities for all tools and test equipment are available to T Plant maintenance personnel and additional storage is required to ensure compliance with DOE Order 4330.4B (DOE 1994). Permanent storage areas will be designated in the new maintenance facility discussed in 4.3.1.A.

Improvement: Maintenance tool and test equipment storage areas that are readily available, accessible, and of appropriate design are being developed and will be implemented when funded with the maintenance facility.

4.3.3 Office Equipment

Objective: Maintenance facilities include office equipment that supports the maintenance organization in a high-quality manner. Adequate communication, calculation, reproduction, and other office equipment including computer terminals should be accessible and maintained in a reliable working condition.

Discussion: T Plant provides all office equipment necessary to support efficient maintenance, such as furniture, computers, and reproduction equipment. T Plant is in compliance with the intent of the Order.

Improvement: No improvement is required.

4.4 TYPES OF MAINTENANCE

This section of the MIP describes how T Plant will employ a proper balance of corrective and PM to provide a high degree of confidence that facility equipment degradation is identified and corrected, that equipment life is optimized, and the maintenance program is cost effective.

4.4.1 Master Equipment List (MEL)

Objective: Develop, maintain, and use a MEL of both safety-related and non-safety-related equipment and components.

Discussion: Generalized safety checklists have been developed and a SEL has been generated, but a MEL has not. Partial lists of some equipment are available through the PM/CBRS and other tracking systems. The MEL is being developed as the equipment is scheduled by maintenance personnel. It is felt that a MEL at the component level is not necessary to maintain equipment history; therefore, the brunt of the effort to develop the MEL will be at the major component level, i.e., a fan assembly would only break down to the driver and driven units.

Improvement: An interim MEL will be developed and implemented.

4.4.2 Types of Maintenance

4.4.2.A. Corrective Maintenance

Objective: Corrective maintenance is performed to restore mechanical systems and equipment to good working order. Root cause analysis of failure should be performed, and priorities for corrective maintenance should be established based on plant objectives and the relative importance of the equipment.

Discussion: T Plant is in compliance with the intent of the Order. Corrective maintenance requirements are addressed in WHC documentation, as well as conditions for acceptability and frequency of performance. Corrective maintenance repair priorities are set using the graded approach to maintenance. Root cause analysis is performed as required by engineering personnel. The Job Control System (JCS) allows for documentation of all corrective action activities performed.

Improvement: No improvement required.

4.4.2.B. PM

Objective: Develop a PM program consisting of systematically planned and scheduled actions performed for the purpose of preventing equipment failure.

Discussion: T Plant PM is performed under WHC PM/CBRS programs, which ensure that all applicable guidelines for preventive maintenance are followed including documentation. T Plant is in compliance with the intent of the Order. A five-year maintenance plan is required to supplement the PM program.

Improvement: Develop the five-year maintenance schedule.

4.4.2.C. Predictive Maintenance

Objective: Predictive maintenance actions are effective in reducing the failure of structures, systems, and components by using techniques that indicate the need for PM prior to equipment failure.

Discussion: A predictive maintenance study was performed and it was determined that implementation of a predictive maintenance program for T Plant installed equipment is not cost-effective. The cost of monitoring the equipment in many cases far exceeds the cost of the equipment. New installations will be reviewed for predictive maintenance requirements and existing requirements will be reviewed. T Plant is in compliance with the intent of the Order.

Improvement: No improvement required.

4.4.3 Maintenance Action and Frequency Selection

Objective: Using the interim MEL, the effectiveness of the PM program is periodically evaluated in relation to satisfying code and specification requirements and to ensure optimum equipment performance in a cost-effective manner.

Discussion: Self-evaluation testing (with follow-up evaluation of deficiencies) is required and has been performed as part of the PM program. Preventive maintenance frequencies are established using specifications and code requirements, manufacturers' recommendations, plant operating experience, engineering requirements, cost/benefit evaluations, and operating history and the results factored into the graded approach to maintenance. The development of an interim MEL is required in order to fully evaluate the PM program for T Plant and is ongoing.

Improvement: Development of an interim MEL will be implemented in accordance with the attached schedule.

4.4.4 Scheduling

Objective: Scheduling and control of identified PM actions are properly completed and coordinated with corrective maintenance activities when possible.

Discussion: Periodic assessment of results and updating of procedures is required, and PM is conducted/scheduled in accordance with plant operations to avoid disruptions. Further, when corrective maintenance actions are required, integration utilizing the JCS is performed. The advent of a "rolling" monthly schedule in T Plant will reduce much of the confusion over scheduling and allow a smarter approach to maintenance. T Plant is in compliance with the intent of the Order.

Improvement: Develop the monthly schedule in accordance with the attached schedule.

4.5 MAINTENANCE PROCEDURES

This section describes how T Plant prepares and uses maintenance procedures and other work related documents (e.g., drawings and instructions) to provide appropriate work direction and ensures that maintenance is done safely and efficiently.

4.5.1 Procedures Development and Writing

Objective: Maintenance procedures have been prepared that detail the specific procedures in a clear, concise manner and consistent format, with easily understood text that details all aspects of the procedure.

Discussion: Guidance for developing new or revised maintenance procedures is provided. These comply with DOE Order 4430.4A (DOE 1994) requirements. All work at T Plant requires a procedure approved as the approval designator dictates as set by the cognizant engineer. T Plant develops procedures using appropriate guidance. Guidance includes requirements for testing and approval, and pre-approved corrective maintenance procedures are being developed. The development and signature trail includes, but is not limited to, Health Physics for HP hold points, Quality Assurance (QA) for QA hold points and Industrial Safety for safety issues. "Boilerplate" items are consistent in both PMs and corrective maintenance procedures to ensure the safety of the maintenance personnel and the plant. Workmanship standards are also provided for some commonly performed WHC work activities.

Improvement: Update plant procedures in accordance with applicable requirements. Include specifics for procedure development consistent with PM and CBRS procedures. Ensure new plant-specific procedures comply with the Order. Continue development of pre-approved corrective maintenance procedures.

4.5.2 Procedure Verification

Objective: Verification through appropriate review and revision of procedures and documents is performed to ensure proper format and technical accuracy.

Discussion: Procedure verification is required for new or revised maintenance, and all appropriate verification protocol is followed, including procedure review by the maintenance manager and other requisite personnel. New or revised procedures are written in such a manner that full use of equipment is described, from equipment preparation to returning the equipment to full operation.

Improvement: Document method to ensure proper verification is performed consistently.

4.5.3 Procedure Validation

Objective: Procedures are validated to ensure usability and correctness prior to use.

Discussion: Procedure validation is required for new or revised maintenance procedures. Prior to issuance, procedures are tested or table-top reviewed to assure that the procedure will accomplish the requisite task. Changes to a PM procedure are normally discussed at a "tabletop" meeting with crafts persons familiar with the equipment, cognizant engineers and maintenance engineers, with a maintenance supervisor/manager as the chairman. Changes to a procedure may be initiated by the most junior person on the job at any point in the life of the procedure. A management walkdown is performed as the next logical step to insure the procedure can be accomplished as written. The final verification of the procedure is during "first use." Each change is researched by the cognizant engineer utilizing Certified Vendor Data and plant configuration information. T Plant is in compliance with the intent of the Order.

Improvement: Document method to ensure proper verification is performed consistently.

4.5.4 Procedure Approval

Objective: Procedures are approved by the maintenance manager or his/her designee.

Discussion: Appropriate approval is required for maintenance procedures, and the procedure control program must address procedure development, revision, and issuance control. Procedure control is established in a documented, well-defined, proven program, detailing individual and organizational responsibilities and authorities. The approval chain for the procedure is set by the approval designator of the procedure. At a minimum the cognizant engineer, an Operations representative and the Maintenance manager or his/her designated representative will approve the procedure. However, the consistency of the approval chain could be improved. T Plant is in compliance with the intent of the Order.

Improvement: Document method to ensure proper approval is performed consistently.

4.5.5 Procedure Use

Objective: Procedures are clear, concise, and contain adequate information for users to understand and perform their activities safely and effectively. Procedural compliance requirements should be clearly stated in the procedure or provided as general administrative guidance and should be thoroughly understood by each plant craftsman. Each procedure user must understand that procedure compliance is required in all cases.

Discussion: T Plant maintenance management requires that all maintenance procedures be clear and concise and contain adequate information to enable safe and effective performance of the activity. T Plant procedural compliance requirements are clearly defined and communicated to employees. Continual re-evaluation of procedures is performed, and improvement/ revisions are made on an as-needed basis. If a step in a procedure cannot be accomplished due to a procedural error, the craft person knows to document the error by submitting a change request to the procedure. Changes to a procedure may be initiated by the most junior person on the job, and each change is evaluated by the Maintenance manager or his/her designated representative.

Improvement: T Plant is in compliance with the intent of the Order.

4.5.6 Procedure Control, Revision, and Periodic Review

Objective: A policy governing maintenance procedure development, control, revision, and periodic review is implemented, including clearly defined responsibilities for program administration.

Discussion: Specific requirements for development of maintenance policies and procedures are provided in WHC guidance. T Plant utilizes these directives to control procedures, revise procedures, and review procedures once they are developed. Maintenance procedures are controlled in the master computer file to assure that only the most recent revision of procedures are used. Certified Vendor Data (CVI) is kept in a centralized file for use by any organization and is used as part of the certification process. Maintenance Engineering personnel performs periodic reviews of procedures. T Plant is in compliance with the intent of the Order.

Improvement: T Plant is in compliance with the intent of the Order.

4.6 PLANNING, SCHEDULING, AND COORDINATION OF MAINTENANCE

This section describes how T Plant will develop an effective system for planning, scheduling, and coordinating maintenance activities in order to ensure that maintenance is accomplished in a timely manner; improve maintenance efficiency; reduce exposure to hazardous situations As Low As Reasonably Achievable (ALARA); and increase equipment availability.

4.6.1 Planning for Maintenance Activities

4.6.1.A. Planning Group Organization

Objective: Planning of maintenance activities is performed by a centralized planning group that is dedicated to this function.

Discussion: A centralized group planning for T Plant maintenance is being developed and will be implemented in accordance with the attached schedules. Planning currently is comprised of (1) a daily/weekly scheduler, (2) a piping Planner, (3) a general Planner (4) PM/CBRS Planner, (5) Job Control Administrator, and (6) a Clerk. The ALARA concerns are added by a Health Physics Engineer. Nearly 200 jobs are in the backlog . The planning staff is in more of a reactive mode rather than a proactive mode. Improvements are needed to improve the efficiency of the planning group.

Improvement: Add personnel to the planning group as funding permits.

4.6.1.B. Planning Group Responsibilities

Objective: All work packages are pre reviewed and post reviewed by the planning group or a representative of this group. The level of the review is dependant upon the complexity of the package.

Discussion: Pre-review and post-review are required for all work packages. Personnel such as the T Plant maintenance manager, cognizant engineer, Quality Assurance representatives, and Safety representatives are required to perform the pre review, with the specific personnel performing the review dependant upon the nature of the work packages to be evaluated. Post reviews are done by an outside party if required. Normal post reviews are accomplished by the JCS Administrator and the Facility Representative in Operations. T Plant is in compliance with the intent of the Order.

Improvement: Formalize the review process to allow a subject matter expert do the initial post review on each package. This will reveal any shortfalls in the package and will increase the package quality control.

4.6.2 Scheduling Maintenance Activities

4.6.2.A. Control of Work Backlog

Objective: A work control system is in place so that maintenance backlog is controlled and effectively managed, including prioritization, coordination of preventive and corrective maintenance, and delays.

Discussion: Data management/tracking is required, and a maintenance-specific work control program is used. T Plant utilizes the JCS system to control/monitor work, as well as to assist in coordination of maintenance efforts. The work backlog at T-Plant is substantial, and control of this backlog is assisted through the use of the JCS system. Implementation of a "rolling" monthly schedule covering at least three months and interacting with the Level IV schedules is required to effectively manage the maintenance activities at T Plant. The implementation of an interim MEL will greatly assist in the backlog reduction and equipment history tracking. The requirements will be implemented in accordance with the approved schedule.

Improvement: Continue to decrease the maintenance backlog in order to effectively schedule and manage that work. Implement a rolling monthly schedule that interacts with the daily, weekly and level 4 schedules. This task will be implemented as the T Plant decontamination mission further develops.

4.6.2.B. Work Priority

Objective: Management control of work is accomplished through the use of an effective priority assignment system based on safety and reliability.

Discussion: The Work Priority System designates the importance of work activities relative to the facility, plant safety, environmental requirements, and personnel. T Plant utilizes the graded approach to determine maintenance priority on a day-to-day basis. This information is placed in the Level IV schedules, Plan of the Day, and Plan of the Month. T Plant is in compliance with the intent of the Order.

Improvement: No improvement is required.

4.6.3 Coordination of Maintenance Activities

Objective: Coordination of maintenance activities with support organizations is facilitated through periodic and frequent meetings to ensure that work can be accomplished effectively.

Discussion: Routine planning meetings (i.e., Plan of the Day, Plan of the Month), including those for maintenance, are performed, and maintenance safety meetings are held weekly to ensure coordination of activities. Additionally, other meetings, such as the weekly staff meetings, serve to support in-house coordination efforts relative to maintenance activities. A rolling monthly schedule will be an asset in the coordination of maintenance activities. T Plant is in compliance with the intent of the Order.

Improvement: Develop and implement a monthly schedule.

4.6.4 Outage Planning, Scheduling and Coordination

Objective: Outage planning, scheduling, and coordination fall into two categories: planned outages and forced outages. Successful outage planning has two common elements: defined responsibilities for planning, scheduling, and coordination and a standard method of identifying non-outage work that will be performed during the outage.

Discussion: A formal outage program for maintenance work has been developed in T Plant in accordance with applicable documentation. Work is performed on equipment as it fails or in a PM schedule. An outage schedule is utilized for process equipment maintenance on the Level IV schedules. All work required for startup is identified, including work in the backlog and is scheduled if possible. This work is tracked on a separate work schedule if the work is major. An outage follow-up critique and initial planning meeting for the next outage is scheduled after the completion of the outage.

Improvement: No improvement is required.

4.7 CONTROL MAINTENANCE ACTIVITIES

Management-directed and -delegated involvement in control of maintenance activities should ensure that maintenance practices are effective in maintaining safe and reliable facility operations.

4.7.1 Work Control Procedure

Objective: Develop and maintain a work control process that includes corrective maintenance, modifications, in-service tests, surveillance, and PM actions. The procedure addresses a description of the work request form, who can initiate and approve the work request, a description of the work control process, supervisory responsibility for controlling maintenance, the priority system, and special conditions that may be encountered (e.g., confined space entry, excavation).

Description: The current system is a combined manual and computerized process with built-in interface. It contains all of the elements described in the objective.

Improvement: No improvement required.

4.7.2 Work Request

Objective: Proper work request packages are prepared for all work. The work request should clearly define the work to be performed, including equipment identification, work instructions, safety requirements, hold points, instructions for retest and acceptance criteria. The work request should be reviewed by affected groups during the planning process.

Discussion: Work packages specific to maintenance are prepared using the JCS system, which controls the facility work control program. Work package documents clearly define the task to be performed, equipment to be used, and documentation requirements, as well as appropriate work review both before job initiation and after job completion. Work packages are prioritized and are reviewed by the planning group and other groups as dictated by the package approval designator prior to release and after completion. All jobs are released at the beginning of each shift unless they are carry-over work from the previous shift and then are included in supervisor pass-down. A crafts usage log is provided in each package, which documents as-found/as-left conditions or deviations from the normal. The signature cycle of a work request from the cognizant engineer through the various other activities has at times been a problem and needs improvement. T Plant is in compliance with the intent of the Order.

Improvement: No improvement is required.

4.7.3 Supervision of Maintenance Activities

Objective: Maintenance supervisors will assure that maintenance is being conducted in accordance with DOE and facility policies and procedures. In addition, they will recognize good work practices, as well as poor work practices. Identifying the causes of poor work practices and taking immediate corrective action as required.

Discussion: Maintenance managers and supervisors routinely monitor work and take an active role in maintenance activities being performed. Pre-job briefings are held for most jobs, quality of workmanship is discussed in weekly meetings, and work progress is discussed daily. PICs are assigned for most jobs and ensure procedures are used, safety rules are adhered to, ALARA is taken into consideration, and quality of workmanship is maintained. PICs are assigned from the maintenance supervisors, planning, operations and engineering. T Plant is in compliance with the intent of the Order.

Improvement: No improvement is required.

4.7.4 Review of Completed Work Requests

Objective: Supervisors will review work requests to assure that the work has been completed as described and that all required documentation has been completed. They shall also review with the craft employees the as-found and as-left conditions to ensure that the equipment will operate as designed and that no rework is required. If rework is required, the supervisors are responsible to take the necessary action to correct the deficiency. The shift operations manager or his/her delegate shall review the work request to ensure that the work has been completed and the equipment can be returned to service when needed. Others, such as Engineering, Quality Assurance, Safety, etc., will perform reviews as required to analyze data collected or to assure that all requirements have been met.

Discussion: Documentation of retests is required, and post-work review of maintenance actions is performed by the appropriate personnel prior to returning the system or equipment into service. The responsible planner will review the package for additional work and document that work in a J-7 or a new work package. Additional review is performed as required by Engineering, Quality Assurance, Safety, and Operations under the JCS. T Plant is in compliance with the intent of the Order.

Improvement: No improvement is required.

4.7.5 Temporary Repairs

Objective: Procedures are in place to assure permanent corrective action is taken whenever temporary repairs have been made, before equipment/systems are allowed to remain in service.

Discussion: The JCS, which is used by T Plant, identifies the vehicle to perform temporary repairs/modifications in accordance with sound engineering practices (WHC-CM-6-1). T Plant is in compliance with the intent of the Order.

Improvement: No improvement is required.

4.7.6 Control of Non-Facility Contractor and Subcontractor Personnel

Objective: Contractor and subcontractor personnel work under the same controls and standards as facility personnel. Contractor managers are held accountable for the work performed by their personnel. Facility management reviews the work of contractor and subcontractor personnel while preparing to do work, at the work site, and during post-maintenance testing and acceptance.

Discussion: All contractor and subcontractor work is performed and tracked by T Plant Operations. There is only limited maintenance work performed by contractors. Contractor management is held responsible and accountable for work performed by their personnel. Facility management, through a liaison organization, is involved with work preparation and field work performed by subcontractor personnel. Facility management overviews post-maintenance testing and acceptance through acceptance testing and operational performance testing. T Plant is in compliance with the intent of the Order.

Improvement: No improvement is required.

4.8 POST-MAINTENANCE TESTING

Post-maintenance testing should be performed to verify that components will fulfill their design function when returned to service after maintenance.

4.8.1 Post-Maintenance Test Requirements

Objective: A post-maintenance testing program that is part of the work control system is established to control and document post-maintenance testing.

Discussion: Post-maintenance testing/review is an important part of the JCS, which is used by T Plant. Appropriate testing requirements and methods are followed to ensure that equipment returned to use has been repaired appropriately and will perform its intended function. Each package is reviewed by the cognizant engineer at the minimum and by Quality Assurance and Safety if so designated. T Plant is in compliance with the intent of the Order.

Improvement: No improvement is required.

4.8.2 Post-Maintenance Test Program Scope

Objective: Program scope includes types of equipment to be tested and type of test to be performed.

Discussion: The DOE Order 4330.4B (DOE 1994) requires that all maintenance activities are reviewed for applicability of post-maintenance testing and to ensure that appropriate test instructions are provided. The JCS, through the approval designator assignment and signature cycle, ensures that appropriate post-maintenance testing is performed, the level of which is a function of the importance of the equipment and its safety-related classification. Testing aspects are also reviewed by appropriate organizations as designated by

the approval designator of the work document and the Safety Class of the equipment. T Plant is in compliance with the intent of the Order.

Improvement: No improvement is required.

4.8.3 Post-Maintenance Test Program Control

Objective: The work control program addresses control of post-maintenance testing and designates organizations responsible for test control and tracking/evaluation of results.

Discussion: Work control, operations, and cognizant engineer review is performed, as well as tracking under the JCS.

Improvement: No improvement is required.

4.8.4 Post-Maintenance Test Performance, Documentation, and Acceptance

Objective: Responsibility for post-maintenance testing is assigned, and the responsible organization reviews the work performed to ensure that the post-maintenance test is appropriate. The operational organization reviews and verifies acceptance.

Discussion: Post-maintenance testing is performed in accordance with the JCS, which requires that appropriate documentation be prepared. Equipment is returned to service only after the work package or PM testing requirements have been met. Closeout of work packages includes review and acceptance by appropriate personnel/organizations as required by the Safety Class of the equipment and the approval designator of the work procedure. T Plant is in compliance with the intent of the Order.

Improvement: No improvement is required.

4.9 PROCUREMENT OF PARTS, MATERIALS, AND SERVICES

Parts, materials, and services required for maintenance activities should be available when needed.

4.9.1 Procurement Policy and Procedures

Objective: Ensure that all T Plant personnel who are directly involved with the procurement of parts, materials, and services totally comply with procurement policies and procedures.

Discussion: The procurement of parts, materials, and services is a service provided by a single procurement organization. All procurement actions are conducted using existing government

regulations. Facility personnel requesting procurement actions are required to use a standardized format as directed by the procurement organization. T Plant has few spare part line items identified. The spare parts program for T Plant needs attention in order to alleviate the reaction mode of procurement personnel. The parts currently in the program are reviewed in accordance with existing directives and obsolete/outdated parts are purged.

Improvement: Further improve the spare parts program for T Plant that takes into account all equipment and will be updated as design changes to that equipment occur.

4.9.2 Procurement Initiation

Objective: Timely procurement of parts, materials, and services for maintenance activities is enhanced through identification of technical requirements, vendor pre-selection, and updated spare parts inventories.

Discussion: Procurement of materials submitted as part of the JCS/work control process is achieved within the designated time frame for the work control order to be processed and can be expedited, if required (i.e., emergency procurements). Electronic ordering may also be used for store stock to ensure more timely procurement. Vendors are evaluated relative to delivery time.

Improvement: No improvement necessary.

4.9.3 Procurement Control

Objective: Procurement controls are developed and maintained, including material inspection to ensure conformance with purchasing requirements, reliability of supplier, and QA.

Discussion: Conformance is assured through utilization of in-house QA, under which inspection of procured equipment/materials is performed. Central Stores, which initially receives equipment prior to dispersement to T Plant, also is responsible for materials control/ conformance evaluation, as well as evaluation of suppliers. T Plant is in compliance with the intent of the Order.

Improvement: No improvement is required.

4.9.4 Services

Objective: Procedures are in place to assure timely response from vendors for required specialized services. Provisions should be made for emergency or short-notice support.

Discussion: Blanket service contracts are used for some equipment, ensuring that timely responses from vendors for repair of equipment are received. Individual service contracts are used to deliver specific or specialized services. A program for selection and procurement of service contracts is in place and utilized by T Plant. T Plant is in compliance with the intent of the Order.

Improvement: No improvement is required.

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

All phases of receiving, inspection, handling, storing, retrieving, and issuing equipment, parts, and materials for maintenance should be covered by effectively implemented policies and procedures consistent with the QA requirements of DOE Order 5700.6B, *Quality Assurance* (DOE 1991c), from the time an item is received until it is installed in the facility.

4.10.1 Receipt and Inspection

Objective: Inspection of purchased parts, materials, and equipment, is performed prior to acceptance for storage or use. Adequate organizational responsibilities are assigned, including interfaces between design, procurement, and QA organizations.

Discussion: Receipt inspection is performed by Central Stores. Additional QA inspection of T Plant equipment is performed to ensure acquisition of quality material. Inspection criteria are determined on a case-by-case basis. Procedures and organizational responsibilities have been developed, and are included by reference within JCS documentation. T Plant is in compliance with the intent of the Order.

Improvement: No improvement is required.

4.10.2 Handling

Objective: Procedures are prepared for equipment requiring special handling instructions, including manufacturers' certifications. Sound handling practices should be followed when no specific procedure is required.

Discussion: Special handling requirements for equipment such as welding filler material are followed, and T Plant implements all special handling requirements as indicated by the vendor. Administrative controls relative to safety and safe handling of equipment have been developed and are implemented at

T Plant. Procedures are in place for inspection and safe use of hoisting and rigging equipment. T Plant is in compliance with the intent of the Order.

Improvement: No improvement is required.

4.10.3 Storage Material and Equipment

Objective: Material and equipment should be stored in a manner that provides maximum protection and ready availability for its intended use. A program that complies with requirements supplied by the vendor is in place providing for periodic inspections and PM of stored material and equipment. The stores record system documentation should include current inventory status, minimum/maximum limits, location, and tracking of shelf life.

Discussion: Central Stores monitors shelf life of equipment/material in its possession. Walk-through inspections of storage areas are conducted in accordance with current procedures. Maintenance managers and/or appropriate personnel include periodic inspection of storage areas and materials in general housekeeping inspections. Basic segregation of equipment or materials is performed and material tracking practices have been implemented.

Improvement: Improvement of the detailed equipment materials/control program is ongoing.

4.10.4 Retrieval and Issuance

Objective: An effective program is implemented for issuing parts, materials, and equipment from storage, to include applicable special handling, documentation, and traceability. A catalog for parts, material, and equipment should be developed to assist in efficient planning and execution of maintenance activities.

Discussion: T Plant has not generated a list of required spare parts and has not determined minimum/maximum stocking levels. General procedure/policy for parts cataloging has been developed, but T Plant has not developed its own spare parts inventory list as part of a spare parts program. However, a sitewide spare parts catalog has been developed and is available. An inventory (tagging) system is currently being performed to ensure that inventory is identifiable and traceable.

Improvement: T Plant will further implement the Spare Parts Program both in ready stores and at the maintenance shop level.

4.11 CONTROL AND CALIBRATION OF MEASURING AND TEST EQUIPMENT

The program for control and calibration of measuring and test equipment (M&TE) should be consistent with the QA requirements of DOE 5700.6B, *Quality Assurance* (DOE 1991c), and ensure the accurate performance of facility instrumentation and equipment for testing, calibration, and repairs.

4.11.1 Identification

Objective: Each piece of M&TE is assigned a unique, permanently marked or attached identification number for identifying, tracing, and controlling M&TE, and a master list of all controlled M&TE should be maintained by plant personnel.

Discussion: Calibration of equipment is performed, and M&TE equipment tagging is currently being performed. An overall equipment control system for M&TE equipment has been established.

Improvement: No improvement required.

4.11.2 Calibration

4.11.2.A. Calibration Standards

Objective: Calibration standards and recalibration must be traceable to the National Institute of Standards and Technology (NIST) or other nationally recognized standards. Calibration standards are stored and issued using specific issuance controls. Standards should be calibrated on a frequency consistent with vendor recommendations and facility experience, and calibration records for standards should be consistent with those for other M&TE.

Discussion: Calibration is required using appropriate standards and is accomplished by using a recall system. WHC is the prime vendor for calibration services on site with Pacific Northwest Laboratories (PNL) performing limited calibrations on specific equipment following DOE and WHC requirements. Calibration standards are traceable to NIST and are appropriately stored and issued. T Plant is in compliance with the intent of the Order.

Improvement: No improvement is required.

4.11.2.B. Calibration Procedures

Objective: Calibration of equipment is performed by qualified technicians using approved procedures. The "ratio of accuracy" of the standard relative to the M&TE being calibrated is as high as reasonably achievable and is consistent with national standards.

Discussion: Calibration is required and is performed by qualified technical personnel following approved procedures. T Plant is in compliance with the intent of the Order.

Improvement: No improvement is required.

4.11.2.C. Calibration Frequency

Objective: Calibration frequency is determined based on the manufacturers' recommendations, M&TE usage, and M&TE historical reliability.

Discussion: Calibration is performed at the required frequencies. T Plant is in compliance with the intent of the Order.

Improvement: No improvement is required.

4.11.2.D. Functional Checks

Objective: The desired response or acceptance criteria are clearly specified or indicated on the equipment when operational tests, functional checks, or battery checks of M&TE are performed.

Discussion: Personnel performing these checks are knowledgeable of required test responses for M&TE tests/checks. T Plant is in compliance with the intent of the Order.

Improvement: No improvement is required.

4.11.3 Control

4.11.3.A. Storage

Objective: Calibration standards are stored appropriately to assure equipment is protected from damage, readily retrievable, and properly maintained. Segregation of M&TE equipment based on calibration is performed, and equipment must be distinctively marked.

Discussion: Calibration standards are stored in accordance with DOE Order 4330.4B requirements (DOE 1994) to protect the standards from damage and to assure retrievability and useability. T Plant is in compliance with the intent of the Order.

Improvement: No improvement is required.

4.11.3.B. Uncalibrated M&TE

Objective: New M&TE devices are calibrated prior to use to verify that they meet acceptance criteria, are functional, and are safe to use. Controls are in place for the storing and checking

of uncalibrated testing equipment, and uncalibrated (troubleshooting) equipment is periodically checked for operability and safety.

Discussion: Controls for storing uncalibrated test equipment (troubleshooting equipment) are in place. Uncalibrated M&TE is periodically checked against fully calibrated equipment. T Plant is in compliance with the intent of the Order.

Improvement: No improvement is required.

4.11.3.C. M&TE with Limited Use

Objective: M&TE devices with special uses, limitations, or restrictions are clearly marked or tagged to describe their applications and limitations.

Discussion: T Plant has marked calibration standards in the appropriate manner to ensure that applications and limitations are identified. T Plant is in compliance with the intent of the Order.

Improvement: No improvement is required.

4.11.3.D. Issue and Recall

Objective: Controls for issuing equipment to qualified people, documentation as to where equipment was used, and a recall system for calibration are in place. Issued equipment should be traceable and the recall system implemented to ensure that M&TE devices are removed from service prior to or at the expiration of their calibration.

Discussion: Traceability and recall procedures are required and are in place. A method of tracing M&TE back to equipment has been established but will be improved with the hiring of a tool room attendant. Control of equipment is now the responsibility of qualified crafts. T Plant is in compliance with the intent of the Order.

Improvement: Improve the tracking system by implementing the tool control attendant system.

4.11.3.E. Contaminated M&TE

Objective: Equipment subject to radioactive contamination is given special protection and storage to minimize the possibility of external and internal contamination.

Discussion: T Plant ensures the safety of personnel by providing special protection and packaging of equipment that may have been radioactively contaminated. Any item used in a suspect area

must undergo a full radiological survey prior to leaving the area or must remain in the area. T Plant is in compliance with the intent of the Order.

Improvement: No improvement is required.

4.11.4 Evaluation

4.11.4.A. Out-of-Calibration and Defective M&TE

Objective: M&TE equipment is evaluated when found to be out of calibration, defective, or otherwise unreliable. Calibration records are retrievable and should be reviewed to determine whether recalibration or rework is needed.

Discussion: Calibration results are included in the CBRS/PM programs (as appropriate). T Plant maintenance has developed a bar code system to track equipment, M&TE and Work Packages to insure defective M&TE can be tracked to last use.

Improvement: No improvement is required.

4.11.4.B. Performance Trending

Objective: Performance trending is performed to identify needed corrections or changes to M&TE procedures, such as adding or deleting M&TE devices, adjusting calibration frequencies, correcting procedures, or upgrading M&TE quality.

Discussion: M&TE usage must be controlled and evaluated to ensure proper utilization, which can be accomplished through performance trending. Performance trending training is an integral part of training for some personnel, and performance trending of M&TE calibration data performed is accomplished by Maintenance Engineering. T Plant is in compliance with the intent of the Order.

Improvement: No improvement is required.

4.12 MAINTENANCE TOOLS AND EQUIPMENT CONTROL

Methods should be established to provide for storage, issuance, and maintenance of an adequate and readily available supply of tools and equipment and also for the development of special tools and equipment needed in the maintenance program.

4.12.1 Storage and Issuance

Objective: Procedures and responsibilities for tool control (storage and issuance) are in place, including acquisition of special tools and equipment.

Discussion: Tools are issued to personnel by shop, but T Plant has not developed a tool control system with crib attendants to track the appropriate tools and equipment. Tools are kept in the shops in roll-away cabinets or boxes, which are normally kept locked. Tools are removed for usage and restored after use. Damaged tools are removed and turned over to supervisors to determine cause of failure and to initiate procurement. Special tools are maintained by the respective shops.

Improvement: Current manning and the numbers of special tools and equipment justifies a separate position at T Plant as a tool crib person. T Plant Maintenance intends to implement a Tool/Equipment Control Program in accordance with the attached schedule.

4.12.2 Tool and Equipment Maintenance

Objective: Preventive maintenance procedures are in place for maintenance tools and other support equipment. Only safe, usable tools should be available; unrepairable tools should be disposed of in a timely manner.

Discussion: A PM program has been initiated at T Plant that includes verification that PM on tools and support equipment has been performed. Tools that are deemed unsafe or unusable are turned over to supervisory personnel for disposition. T Plant is in compliance with the intent of the Order.

Improvement: No improvement is required.

4.12.3 Use of Special Tools and Equipment

Objective: Procedures or instructions are in place for the use of special equipment or tools, such as lifting and rigging equipment, test rigs, and mockups to ensure cost justification, effectiveness, and safety. Maintenance supervisors should review these procedures, particularly those for high-hazard or high-risk tasks.

Discussion: Specialized equipment is made available as necessary, and procedures have been developed for using special equipment such as cranes or hoists. Procedures for use of special equipment comply with requirements set forth in DOE Order 4330.4B (DOE 1994).

Improvement: No improvement is required.

4.13 FACILITY CONDITIONS INSPECTION

Management should conduct periodic inspections of equipment and facilities to assure excellent facility condition and housekeeping.

4.13.1 Standards

Objective: Managers and supervisors communicate standards relative to appropriate attitudes, work ethics, sound engineering practices, and sound economic practices to all personnel; adherence to these standards is assessed through performance of routine walk-around inspections of equipment and facilities.

Discussion: T Plant Maintenance management and other T Plant managers perform management inspections of plant facilities on a regular basis to ensure that equipment appears to be operating properly. Obvious deficiencies such as noisy gearing, loose belts, leaking fittings, etc., are recorded. Standards for maintenance are communicated through postings, verbally during safety meetings, and during one-on-one housekeeping inspections. Hanford General Employee Training (HGET) includes policies covering OSHA, Employee Concerns, and Standards of Conduct. Regular housekeeping inspections are also performed, as are periodic health-and-safety-related inspections (i.e., OSHA). T Plant is in compliance with the intent of the Order.

Improvement: No improvement is required.

4.13.2 Training

Objective: Personnel involved in facility condition inspections are trained and knowledgeable of the standards expected by the facility manager, including the techniques required to perform facility condition inspections.

Discussion: Inspection training ensures that personnel conducting inspections perform them adequately and appropriately. Personnel performing inspections are made aware of the manager's expectations relative to inspection items, and T Plant has a formalized inspection procedure which is followed when each inspection is performed. T Plant is in compliance with the intent of the Order.

Improvement: No improvement is required.

4.13.3 Procedures

Objective: Administrative procedures that describe the inspection program are in place to define expected standards, provide

documentation of deficiencies, provide for follow-up on corrective actions, assign program implementation responsibilities, and establish a means to measure program effectiveness.

Discussion: A T Plant housekeeping procedure has been developed for the inspection of T Plant facilities. This inspection also includes material condition of equipment. Documentation and tracking of the findings are included in the JCS system. T Plant is in compliance with the intent of the Order.

Improvement: No improvement is required.

4.13.4 Scope of Inspections

Objective: Procedures clearly define the scope of inspections, which includes detailed walk-downs of assigned areas (including remote and limited access areas) and is to incorporate the ALARA concept. Key individuals should accompany managers and supervisor during inspections, and inspections must be of sufficient detail to search for deficiencies.

Discussion: Inspections are performed following established procedures, and include detailed walkdowns of maintenance areas. Deficiencies are investigated and documented. Facility condition inspections are performed under Safety Council inspections as well as by supervisors and as part of good housekeeping practices. The Management Oversight Program (MOP) and Senior Management Oversight Program (SMOP) involve management from other groups in the inspection process. T Plant is in compliance with the intent of the Order.

Improvement: No improvement is required.

4.13.5 Inspection Program Elements

Objective: Routine inspections should encompass an area of the appropriate size to perform a thorough inspection during the allotted time, should be appropriately scheduled, and include periodic rotation of inspectors.

Discussion: T Plant personnel are given adequate time to perform required inspections and associated reports. Inspectors are selected randomly. T Plant is in compliance with the intent of the Order.

Improvement: No improvement is required.

4.13.6 Reporting Deficiencies

Objective: Deficiencies are reported to the appropriate personnel, and are identified, corrected, and documented.

Discussion: Guidance for addressing deficiencies is presented in WHC documentation and is performed under the JCS system. T Plant inspectors report deficiencies to appropriate supervisory personnel so that personnel responsible for particular inspection elements are aware of deficiencies and can initiate appropriate remedies. T Plant is in compliance with the intent of the Order.

Improvement: No improvement is required.

4.13.7 Deficiency Follow-up

Objective: Recurring problems which are not tracked in the work control system or corrective action system(s) are identified. These deficiencies must be reported, listed, monitored, and corrected as necessary, and effectiveness of the corrective action should be reviewed and evaluated.

Discussion: All deficiencies are addressed under either the work control system or an applicable corrective action system. Each deficiency is monitored, and the effectiveness of the corrective action is reviewed as part of the JCS postreview cycle. The T Plant database manager continually reviews the database to determine the effectiveness of the inspection program. T Plant is in compliance with the intent of the Order.

Improvement: No improvement is required.

4.14 MANAGEMENT INVOLVEMENT

To ensure the safety of DOE nuclear facility operations, DOE and contractor corporate and facility managers should be sufficiently involved with facility operations to be technically informed and personally familiar with conditions at the operating facility.

4.14.1 Manager Involvement

Objective: Managers and supervisors perform periodic walk-through inspections to facilitate face-to-face communications and feedback. Results of tours should be documented.

Discussion: The Senior Management Oversight Program (SMOP) assures that senior managers perform and document regular walk-throughs to facilitate management involvement. Level 3 and 4 managers perform regularly scheduled walk-throughs as part

of their housekeeping inspection and document such tours. However, it is felt that more time could be spent in the field by middle managers. Maintenance supervisors are assigned on a 10:1 ratio to allow sufficient time in the field supervising.

Improvement: No improvement is required.

4.14.2 Performance Indicators, Goals, and Objectives Results

Objective: Results of maintenance performance indicators, goals and objectives, and other related information are developed, trended, and reported to provide feedback, which is then used by senior management in progress reviews.

Discussion: Sitewide performance indicators (i.e., accident tracking) have been developed as part of the Operations Excellence Program and are utilized by the T Plant maintenance organization. T Plant-specific performance indicators, such as corrective maintenance backlog tracking, have also been developed.

Improvement: No improvement is required.

4.14.3 Feedback

Objective: A feedback system has been established to promote communications and participation in improvements at all levels of the maintenance organization. "Lessons learned" from maintenance experiences are used to improve performance.

Discussion: Mechanisms are in place for employees to address maintenance concerns and are adequate. Employees may also utilize an appeals board to voice concerns, and JCS includes a feedback mechanism.

Improvement: No improvement is required.

4.14.4 Program Reviews

4.14.4 A. Assessment of Facility Condition and Worker Practices During Maintenance

Objective: Results of inspections, audits, reviews, investigations, and self-assessments are reviewed and evaluated by senior managers. Assessments of facility equipment and systems, the ability of craftsmen to perform high-quality maintenance, and overall effectiveness should be routinely performed and improvements made as appropriate.

Discussion: Periodic evaluation of programs such as PM are performed. Failure analysis of failed equipment is performed in an attempt to determine root cause. Inadequacies in the work control system are documented, and corrections are proposed. Planning and scheduling coordination is accomplished through plan of the day/week/month meetings. Deferred and missed maintenance actions are discussed monthly during backlog reduction meetings. Maintenance Engineering continually reviews PM periodicity to ensure PM is scheduled as needed.

Improvement: No improvement is required.

4.14.4.B. Assessment of Maintenance Training

Objective: Management approves and periodically reviews the maintenance training program. Maintenance personnel performance is monitored to identify needed training program enhancements. Managers' recommendations and trainee feedback are utilized in training program changes.

Discussion: Training checklists are completed, and required personnel performance reviews are conducted by T Plant personnel in order to monitor personnel training needs. Management reviews individual training program requirements, and review of overall training programs is also performed.

Improvement: No improvement is required.

4.14.4.C. Assessment of Measuring and Test Equipment

Objective: The M&TE program is periodically reviewed by management to ensure safe and reliable operation of each station, including availability of M&TE equipment.

Discussion: Management review of M&TE is performed at the first level supervisor, but a formal comprehensive M&TE program is not in place. M&TE is calibrated appropriately, and personnel using M&TE equipment are knowledgeable.

Improvement: T Plant has determined that existing controls are sufficient, and development of an M&TE programmatic review procedure is not necessary. No improvements are planned.

4.15 MAINTENANCE HISTORY

A maintenance history and trending program should be maintained to document data, provide historical information for maintenance planning, and support maintenance and performance trending of facility systems and components.

4.15.1 Program Development

4.15.1.A. Equipment Identification

Objective: The maintenance history program clearly defines the systems and equipment that require documentation and retention of historical data. The MEL compiles this information.

Discussion: T Plant does not have a formal maintenance history program, although maintenance data were available through the PM/CBRS programs. Maintenance information is available through utilization of the JCS program, and specifically, the Maintenance History Module of the JCS. However the system does not cover all elements of the program. A comprehensive equipment history system has been initiated to include all equipment and will be implemented in accordance with the attached schedule.

Improvement: Develop a usable interim MEL and institute history files for equipment so designated. This will be implemented in accordance with the attached schedule.

4.15.1.B. Data Identification

Objective: The maintenance history program defines the type of data to be collected and recorded to support effective use of the information.

Discussion: Completed work packages under JCS will include all relevant maintenance data for a given piece of equipment. Specific data requirements relative to a maintenance history program have not been defined but will include data acquired under the JCS.

Improvement: A detailed Maintenance History Program will be developed for T Plant; definition of the types of data to be collected and recorded will be dictated in specific guidelines.

4.15.2 Data Collection

Objective: Maintenance history data collected for retention is reviewed and retained by a responsible person or organization.

Discussion: T Plant does not have a formal maintenance history program, although maintenance data were available through the PM/CBRS programs. Future maintenance information is planned to be available through utilization of the JCS program, and specifically, the Maintenance History Module of the JCS, once various identification tasks have been performed. Currently that module in JCS is not operational, and there is no specified time when it will be. T Plant will start an equipment history file when the software is available or manning permits.

Improvement: Develop a usable MEL and institute history files for equipment so designated.

4.15.3 Program Use

Objective: Maintenance history data are readily available to and are used by maintenance planners, coordinators, supervisors, and craftsmen. Maintenance history should be periodically reviewed and problems trended; persistent or recurring problems are reported to appropriate personnel for corrective action.

Discussion: The JCS system has included a retrievable history program in a recent upgrade. This allows access to any work packages that have been worked in the past. PM/CBRS is also being incorporated into the JCS system and will include another part of history. Hard copy of CBRS/PM data sheets will be made available in manual history files.

Improvement: Develop a comprehensive maintenance history program for selected equipment at T Plant. Review the information as conditions warrant.

4.16 ANALYSIS OF MAINTENANCE

Systematic analysis should be used to determine and correct root causes of unplanned occurrences related to maintenance.

4.16.1 Information Collection

Objective: Operator logs and records, computer records, interviews, and personnel statements are collected for all unplanned occurrences, and other information pertinent to the investigation should be identified and obtained. Personnel interviews should be performed, as necessary.

Discussion: The T Plant Engineering Services manager coordinates occurrence reporting and has access to operator logs, records, computer records, interviews, and personnel statements.

Improvement: No improvement is required.

4.16.2 Event Analysis

Objective: Systematic analysis is performed to reconstruct unplanned occurrences, including development of a detailed sequence of facts and activities and determination of casual factors (human performance of equipment performance problems).

Discussion: A clear, concise, and objective description of the occurrence is required. Systematic analysis is performed by T Plant personnel when an unplanned occurrence relative to maintenance takes place.

Improvement: No improvement is required.

4.16.3 Cause Determination

Objective: Actual or probable causes of problems are evaluated to establish a final root cause. Correction of the root cause should be feasible, prevent recurrence of the unplanned occurrence, and not adversely impact safety, reliability, or operational goals.

Discussion: Although root cause analysis is not routinely performed for unplanned occurrences, it is accomplished when necessary. Procedures are available to determine whether root cause analysis is required and are used to determine when to initiate this analysis.

Improvement: No improvement is required; root cause analysis is performed as necessary.

4.16.4 Corrective Action

Objective: After determination of all causes of the unplanned occurrence, a corrective action plan is developed, executed, and tracked to completion.

Discussion: Immediate corrective actions are taken and are recorded in the Occurrence Report along with planned corrective actions, their scheduled completion dates, the responsible individuals and organizations, and the Priority/Severity Category assigned to the item. Documentation for execution and tracking of the corrective action plan is acquired under the Current Site deficiency tracking system.

Improvement: No improvement is required.

4.16.5 Corrective Action Follow-up

Objective: Post-repair testing is performed to determine if additional maintenance work or fact finding will be required after corrective action for the unplanned occurrence has been performed. Retesting and extended monitoring of equipment is performed as necessary to ensure desired results are achieved.

Discussion: Post-repair testing is performed for PM, and after corrective actions to ensure that actions taken resolved the problem.

Improvement: No improvement is required.

4.17 MODIFICATION WORK

Facility modification work, including temporary modifications, should be accomplished under the same basic administration controls as those applied to facility maintenance activities so that there is no increase in risk to facility equipment, environment, or personnel because of the modification work.

4.17.1 Maintenance Program Interface with Modifications

Objective: The maintenance program includes control procedures for facility structure, system, or component modifications. Facility maintenance personnel must be cognizant of the effects of modifications prior to maintenance activities, and procedures should require that all modifications be reviewed to identify future maintenance activities, which should then be integrated into the maintenance program.

Discussion: The JCS specifies control procedures for facility, structure, system, and component modifications.

Improvement: No improvement is required.

4.17.2 Temporary Repairs or Temporary Modifications

Objective: A safety review is performed prior to implementation of temporary repairs to ensure adequacy, safety, and reliability of the repair. Temporary repairs should be tracked and permanent corrective action taken as soon as practicable.

Discussion: The maintenance program includes procedures for temporary repairs and are included in the Work Control System (WCS) using Engineering Change Notice (ECN) controls.

Improvement: No improvement is required.

4.18 ADDITIONAL MAINTENANCE MANAGEMENT REQUIREMENTS

A program should be in place to prevent equipment and building damage due to cold weather at any nuclear facility that may be at risk.

4.18.1 Seasonal Facility Preservation Requirements

Objective: A cold weather protection program to assure continued safe facility operations is defined and implemented using approved procedures. The program includes criteria for preparation (and suspension), periodic surveillances, and program effectiveness evaluations. Lessons learned are evaluated and appropriate program changes are made to prevent reoccurrences.

Discussion: A cold weather protection program for T Plant has been developed, implemented, and audited. T Plant used the sitewide weatherization program as a basis to develop a facility-specific program that exceeds the requirements established in the sitewide program.

Improvement: No improvement is required.

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5.0 DEVIATIONS REQUESTED WITH SUPPORTING RATIONALE

REFERENCE PARAGRAPH	DEVIATION
4.14.4.C	Assessment of Measuring and Test Equipment. Due to the size of the maintenance force and the inventory of equipment, T Plant has determined that existing controls are sufficient, and development of an M&TE programmatic review procedure is not necessary.

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6.0 IMPLEMENTATION SCHEDULE

The following schedule reflects when the specific improvements identified in Section 4.0 will be addressed. Those requirements that are identified as requiring funding are scheduled pursuant to funding approval.

This schedule was developed based on current levels of funding, resource availability, and staffing. Schedule item numbers reference the appropriate section of this MIP.

PARA# AND BRIEF DESCRIPTION	SCHEDULED COMPLETION OR STATUS
4.1 MAINTENANCE ORGANIZATION AND ADMINISTRATION	
4.1.3 Staffing Resources Current manning requirements are in a state of flux while the mission of decontamination on the Hanford Site is further defined. As this process is completed, manning documents will be modified to meet established requirements.	**ONGOING**
4.2 TRAINING AND QUALIFICATION OF MAINTENANCE PERSONNEL	
4.2.1 Responsibilities Continue working with Training Branch personnel to develop and monitor an effective training program.	**ONGOING**
4.2.2 Maintenance Training Programs Improve plant-specific training by adding to current training staff and developing a program for plant-specific equipment. T Plant is in compliance with the intent of the Order.	**ONGOING**
4.2.3 Training Schedules and Support Continue monitoring the T Plant training program to include maintenance-specific training, scheduling, and evaluations.	**ONGOING**
4.2.4 On-the-Job-Training (OJT) Continue monitoring the T Plant training program to include maintenance-specific training, scheduling, and evaluations.	**ONGOING**
4.2.5 Qualification Continue with development of the all inclusive maintenance training program with implementation by mid FY96.	**ONGOING**

4.2.6 Training In Root Cause Analysis
Maintain training status of COG Engineering staff in root cause analysis. **ONGOING**

4.2.7 Training Program Approval, Effectiveness, and Feedback
Continue to evaluate the feedback received from various courses of instruction, and make issue to improve the training. **ONGOING**

4.2.8 Management and Supervisory Training
Improvement is ongoing as an integral part of the training evaluation programs. **ONGOING**

4.3 MAINTENANCE FACILITIES, EQUIPMENT AND TOOLS

4.3.1 Facilities

4.3.1.A. Shops and Satellite Areas
Permanent shop areas that are in compliance with the Order will be established that are safe, efficient, of sufficient size, and convenient. Improvements include designing and building new maintenance facilities with storage facilities for T Plant maintenance personnel. New facilities will meet all OSHA and other governing requirements. These items will be implemented when funded. **$1200K[1] 10/99**

4.3.1.B. Laydown and Staging Areas
Permanent and temporary laydown and staging areas are being established as requirements dictate. **ONGOING**

4.3.1.C. Storage Facilities
Permanent storage facilities for tools, supplies, and maintenance equipment will be provided as funding permits. **10/99**

4.3.2 Tool and Equipment Storage
Maintenance tool and test equipment storage areas that are readily available, accessible, and of appropriate design are being developed and will be implemented when funded with the maintenance facility. **10/99**

4.4 TYPES OF MAINTENANCE

4.4.1 Master Equipment List
An interim MEL will be developed and implemented. **10/97**

4.4.2 Types of Maintenance

4.4.2.B. PM
Develop the five-year maintenance schedule. **10/96**

4.4.3 Maintenance Action and Frequency Selection
Development of an interim MEL will be implemented. **10/97**

4.4.4 Scheduling
Develop and implement the monthly schedule. **10/97**

4.5 MAINTENANCE PROCEDURES

4.5.1 Procedures Development and Writing
Update plant procedures in accordance with applicable requirements. Include specifics for procedure development consistent with PM and CBRS procedures. Ensure new plant-specific procedures comply with the Order. Continue development of pre-approved corrective maintenance procedures. **ONGOING**

4.5.2 Procedure Verification
Document method to ensure proper verification is performed consistently. **10/96**

4.5.3 Procedure Validation
Document method to ensure proper validation is performed consistently. **10/96**

4.5.4 Procedure Approval
Document method to ensure proper approval is performed consistently. **10/96**

4.6 PLANNING, SCHEDULING, AND COORDINATION OF MAINTENANCE

4.6.1 Planning for Maintenance Activities

4.6.1 A. Planning Group Organization
Add personnel to the planning group as funding permits. **10/98**

4.6.1.B. Planning Group Responsibilities
Formalize the review process to allow a subject matter expert do the initial post-review on each package. This will reveal any shortfalls in the package and8will increase the package quality control. **10/97**

4.6.2 Scheduling Maintenance Activities

4.6.2.A. Control of Work Backlog
Continue to decrease the maintenance backlog in order to effectively schedule and manage that work. Implement a rolling monthly schedule that interacts with the daily, weekly and level 4 schedules.
This task will be implemented as the T Plant decontamination mission further develops. **10/97**

4.6.3 Coordination of Maintenance Activities
Develop and implement monthly schedule. **1/97**

4.9 PROCUREMENT OF PARTS, MATERIALS, AND SERVICES

4.9.1 Procurement Policy and Procedures
Further improve the spare parts program for T Plant that takes into account all equipment and will be updated as design changes to that equipment occur. **10/96**

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

4.10.3 Storage Material and Equipment
Improvement of the detailed equipment materials/control program is ongoing. **ONGOING**

4.10.4 Retrieval and Issuance
T Plant will further implement the Spare Parts Program both in ready stores and at the maintenance shop level. **ONGOING**

4.11 CONTROL AND CALIBRATION OF MEASURING AND TEST EQUIPMENT

4.11.3.D Issue and Recall
Improve the tracking system by implementing the tool control attendant system. **ONGOING**

4.12.1 Storage and Issuance
Current manning and the numbers of special tools and equipment justifies a separate position at T Plant as a tool crib person. T Plant Maintenance intends to implement a Tool/Equipment Control Program in accordance with the attached schedule. **06/97**

4.15 MAINTENANCE HISTORY

4.15.1 Program Development

4.15.1.A. Equipment Identification
Develop a usable interim MEL and institute history files for equipment so designated. **10/97**

4.15.1.B. Data Identification
A detailed Maintenance History Program will be developed for T Plant; definition of the types of data to be collected and recorded will be dictated in specific guidelines. **10/97**

4.15.2 Data Collection

Develop a usable MEL and institute history files for equipment so designated. **10/97**

4.15.3 Program Use

Develop a maintenance history program for selected equipment at T Plant. Review the information as conditions warrant. **10/97**

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7.0 REFERENCES

DOE, 1991a, *Accreditation of Performance-Based Training for Category A Reactor and Nuclear Facilities*, DOE Order 5480.18A, U.S. Department of Energy, Washington, D.C.

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