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WORK CONTROL IN SEPARATIONS FACILITIES (U)

by

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The topic addressed in this technical review is the development and implementation of a work control program in one of the chemical separations facilities at the Savannah River Site (SRS) in Aiken, SC. This program will be used as a pilot for the Nuclear Materials Processing Division at the site.

The SRS Work Control Pilot program is based on the Institute of Nuclear Power Operations (INPO) good practices and guidelines for the conduct of maintenance and complies with SRS quality assurance and DOE orders on maintenance management. The program follows a ten-step process for control of maintenance and maintenance-related activities in a chemical separations facility. The program took the existing maintenance planning and scheduling system and upgraded it to comply with all INPO work control and related guidelines for histories, post-maintenance testing and scheduling.

The development process of adapting a nuclear-related-based plan to a batch/continuous chemical separations plant was a challenge. There were many opportunities to develop improvements in performance while being creative and realistic in applying reactor maintenance technology to chemical plant maintenance. This pilot program for work control in a nonreactor nuclear facility will provide valuable information for applying a controlled maintenance process to a multiphase chemical operating plant environment.

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INTRODUCTION

Work control is defined at the Savannah River Site as a configuration management process used to manage and control maintenance work activities, modifications, fabrications, and related services. The work control process, if properly executed, should result in efficient and effective management of work and ensure compliance with applicable engineering, health,

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safety, environmental, security, and quality standards and requirements. The Maintenance organization for one of the chemical Separations facilities at the site was tasked with implementing a work control process as a pilot system per site requirements. This meant upgrading a daily planning/scheduling/materials procurement system for maintenance to a systematic process consisting of the following ten sequential steps:

Step 1 Work Item Identification. Work items are formally identified and documented by the owner on a work request and may be identified by installing deficiency tags.

Step 2 Work Item Validation. Work items requested are reviewed by designated personnel to ascertain their validity, necessity, and appropriateness. The designated personnel will determine the work priority and identify the organization responsible for preparing the work package.

Step 3 Work Package Preparation. The work requested is examined by a planner to determine proper and efficient work requirements. The planner identifies items necessary to complete the task, such as manpower requirements, materials, special tooling, and support organization communications. Then the planner prepares a work package that contains the procedures and documents necessary to perform the work.

Step 4 Prework Review and Approval. Designated personnel independently review the work package for completeness and technical adequacy.

Step 5 Staging. A materials coordinator obtains all materials, permits, documents, special tooling, and drawings necessary to perform the work and stages them by a materials coordinator before scheduling.

Step 6 Scheduling. The work control schedulers properly prepare a ready-to-work (RTW) work package and schedule it according to priority, quality classification, availability of facilities and/or equipment, and manpower availability.

Step 7 Coordination and Release. The facility manager or the equipment custodian designee prepares the system/equipment for work and releases the work package.

Step 8 Work Order Performance. An assigned individual who is responsible for directing, monitoring, and reviewing the conduct of the maintenance activity and is responsible for the timely and accurate completion of any associated documentation performs and directs work.

Step 9 Work Completion and Retest. Upon completion of the maintenance activity, the maintenance supervisor reviews the documentation for completeness. The maintenance supervisor also performs any postmaintenance testing, and/or functional testing at this point. If the testing is satisfactory, the operating group accepts the work.

Step 10 Postwork Review and Documentation. The completed maintenance work package is reviewed by the group that prepared the package. The work control data entry clerk enters any pertinent maintenance history into the work management system (WMS) database and files the work package for retention.

A core group was established to plan and develop the work control process which would be used in the pilot program, drawing from a combination of existing programs such as a site nuclear reactor program, INPO, and others.

From the initial development stages to nearing full implementation, it has been evident that direct application of commercial nuclear reactor programs would be unfeasible. The purpose of this letter is to describe the planning methods used to develop the separations work control process, important features of the process, benefits to the maintenance business and key learnings during implementation of the pilot program. The results demonstrate that an INPO-based maintenance work control process is possible.

PLANNING METHODS IN DEVELOPING A WORK CONTROL PROCESS

Like other Westinghouse initiatives, the Separations Work Control Process is based on the principle of "total quality", which is defined as performance leadership in meeting customer requirements by doing the right thing right the first time. Total quality applies the following twelve conditions of excellence:

- Customer Satisfaction

  Satisfying internal and external customers through meeting their requirements and value expectations is the primary task of every employee.

- Participation

  All employees participate in establishing and achieving total quality improvement goals.

- Training

  Training is provided to ensure that each employee understands, supports, and contributes to achieving total quality.

- Motivation

  Employees are motivated to achieve total quality through trust, respect, and recognition.

- Products/Services

  Products and services are appropriately innovative and are reviewed, verified, produced, and controlled to meet customer requirements.

- Processes/Procedures

  Processes and procedures are used to create and deliver. Products and services are developed as an integrated, verified, and statistically controlled system using appropriate technology and tools.

- Information

  Required information is clear, complete, accurate, timely, useful, accessible, and integrated with products, services, processes, and procedures.

- Suppliers

  Suppliers are considered partners that are selected, measured, controlled, and recognized on their potential and actual value contributions to meeting requirements for total quality.

- Culture

  Management has established a value system in which individual and group actions adopt a "total quality first" belief and an innovative attitude to meet established world-class requirements.

- Planning

  The Strategic Business and Financial Planning groups recognize total quality as a primary business objective.

- Communications

  Verbal and nonverbal communications are two-way, clear, consistent, and forceful.

- Accountability

  Accountability measures for total quality are established, reported, analyzed, and used effectively.

The core team developing the work control process examined the twelve conditions of excellence of total quality and applied each of the twelve during their developmental work. The results of managing in this manner are shown as a summary in each area of excellence. Application of total quality principles helped ensure a successful formula for the pilot work control process in Separations facilities.

Process for Success

Customer Orientation

The DOE, as external customer for the Work Control organization, was given a program that aligned with INPO, DOE orders, and the NMPD Performance Improvement Plan. The internal and external customers in WSRC, namely Separations and Separations Engineering, were given orientation sessions on the program, requested to participate in procedure development, review and approval, and communicated with daily and weekly planning meetings.

Participation

The entire Work Control organization was involved in the program's development and startup, including procedure development, facility remodeling, and procurement activities by applying quality improvement safety suggestions whenever possible to recognize program improvements. The entire group agreed interactively to begin extended work weeks to assist in program startup.

Training

Over 400 personnel were given orientation sessions on the pilot program. Work Control supervisors were given a professional planner's training course to assist in their job performance.

Motivation

Work Control personnel provided input to design and layout of the office facility. An article for the company newspaper was published that highlighted the program's accomplishments.

Products and Services

The product of the program is a maintenance job package, properly planned, with available parts, and scheduling that is integrated with facility priorities and resources. Prework and postwork reviews of those detailed packages, an integrated PC–based job schedule, and a planner position staffed on each rotating four–shift provides a quality product and service to the customer.

Process and Procedures

To support the program, 42 implementing procedures and 5 flowcharts were developed. A consultant was contracted to provide program oversight during the demonstration period.

Information

Information on program requirements is shared via daily and weekly job planning and scheduling meetings. Available information includes weekly and daily job schedules, programmatic issues, total quality observations, and procedural concerns.

Suppliers

Many supplier organizations contributed to successful development of the Work Control Pilot Program. Major contributors were:

(1) Publications — prepared 5 new document forms

(2) Procurement — expedited requisitions for program needs

(3) Construction — remodeled office facilities

(4) Engineering Procedures — formatted and issued 42 new implementing procedures

Culture

The Work Control Program is a department–wide initiative, supported by department managers, developed and implemented by a cross–cut of department personnel, and focused to meet the needs of all affected work groups.

Planning

The planning process for developing and implementing work control was very intense. A program planning matrix, a procedures development plan, a procurement plan, an implementation schedule, and daily/weekly planning meetings were all tools used in successfully establishing the pilot program.

Communications

Communications with suppliers and customers were continuous and beneficial as described in the other conditions of excellence. Monthly performance indicator reports, staff meetings, and roundtable meetings also contributed to open and frequent employee information sharing.

Accountability

Specific job descriptions were generated for all Work Control positions. A person–in–charge (PIC) concept was developed and applied to each maintenance job package thereby designating accountability for successful job completion on a job–by–job basis. All Work Control personnel have indicators to measure and track individual total quality performance.

The planning process in developing Work Control was essential to the program's success. A plan to identify, number, draft, and to approve procedures allowed 42 implementing procedures to be developed. A plan for a fully trained planning group and a well–informed facility organization allowed for staffing over 30 new planning group positions with experienced personnel, providing a 2-day professional planning course and providing orientation sessions to over 400 personnel. A plan for a state–of–the–art Work Control Center facility allowed for timely procurement of essential furnishings, computer equipment and fixtures, and remodeling of a 1500-square-foot Document Control Center, all within a permanent site building in close proximity to Separations process facilities. An overall plan for meeting customer milestones and commitments allowed for successful implementation, as described above, on schedule and meeting expectations. The overall planning matrix is shown in Figure 1.

IMPORTANT FEATURES OF THE PROCESS

The Work Control process is characterized by ten principles, which when performed in sequence allow for documented control and management of maintenance work. Figure 2 shows the flow of a maintenance work request through the ten steps.

The important features of the process employed in this Separations Pilot Program span all ten steps of work control.

Deficiency Tag

The process begins with identifying deficient equipment and marking it with a controlled tag/sticker. The deficiency tag identifies the problem, validates its need, and initiates a maintenance work request to perform the work. The operations maintenance coordinator validates the work request before initiating a request for work. During work package

processing, the quality engineer determines the need for a nonconformance report based on equipment history, root–cause analysis, and failure trending.

Maintenance Work Request (MWR)

A four-page maintenance work request was developed to properly document and control work during the entire ten-step work control process. The MWR is shown in figures 3, 4, 5, and 6. Page 4 of the MWR, which allows for shift–to–shift work release by the facility operations manager, is shown in Figure 4. The MWR provides accountability for work in progress.

Configuration Control Board (CCB)

A governing body of middle management that was responsible for overall operation of a given facility was chartered to provide conceptual and final design approval of equipment/facility modifications that would impact facility safety; primarily, radiological and nuclear safety. The Control Board reviews all maintenance work/requests for facility modifications or additions of a nuclear safety nature.

Quality Classification

In April of 1990, the Savannah River Site issued a site quality assurance manual. Contained within the manual was a section identifying four quality–based classifications for systems, equipment, and components. The four classifications are defined below, in decreasing order of importance.

Nuclear Safety (NS) Classification

This classification applies to the facilities, systems, structures, and components necessary to protect the health and safety of employees and the public from nuclear hazards. Classification criteria are as follows:

(1) necessary to shut down a reactor or other nuclear system handling fissionable or other highly radioactive material and maintain it in a safe shutdown condition

(2) necessary to prevent accidental or inadvertent criticality

(3) necessary to maintain the integrity of reactor coolant pressure boundaries or other nuclear facility process boundary

(4) necessary to prevent or lessen the consequences of plant conditions that could result in potential offsite radiation exposures and affect the health and safety of the public

This classification would also apply to experimental or prototypical facilities or components that would ultimately perform a nuclear safety function. It would also apply to facilities that handle other–than–fissionable materials where the levels are great enough that releases can affect the health and safety of the public, or where failure could result in a significant release of gaseous radioactivity to the environment.

Critical Protection (CP) Classification

This classification applies to systems, structures, and components that do not perform a direct nuclear safety function, but whose failure could arrest nuclear safety function. This includes fire protection, when associated with Nuclear Safety items and safeguards for Special Nuclear Material. It also applies to systems, primarily waste handling, that handle radioactive materials but are not classified nuclear safety class and also to those facilities, systems, structures, and components whose failure could have serious nonradiological environmental consequences.

Production Support (PS) Classification

This classification applies to systems, structures, or components necessary to support continued operation of an operational facility. The consequences of failure are production-oriented and relate to economic impact or ability to support national defense commitments. Items that have an impact on industrial safety also fit into this category. Production in this context refers to the output of a facility. This could mean the documented results of a research effort if the facility is a laboratory.

General Services (GS) Classification

This classification applies to systems, structures, and components that are administrative and supportive in nature. Failure does not impact the ability to carry out or protect a nuclear safety function. It may be desired to selectively apply controls because of financial considerations as well as the impact of some GS facilities on production or process equipment. All items that do not fall into a higher classification, fall into the GS classification.

The highest classifications are assigned to those systems, structures, and components required for nuclear safety and to those items that ensure the accomplishment of nuclear safety functions or whose failure have other serious radiological or environmental consequences. Production-related concerns and national defense commitments are next in priority. It is expected the highest level, Nuclear Safety class, would ordinarily be subject to full QA program application using all criteria necessary to satisfy DOE Order 5700.6. The remaining classifications allow selective application of QA elements. However, items in all classifications, including GS, must have basic control and verification provisions applied, as appropriate, to ensure the proper level of quality is obtained.

The Work Control Pilot program developed a matrix using the four quality classifications, and applied a graded quality approach to maintenance activities. Each applicable section of the 20 in the site quality assurance manual was reviewed to determine the maintenance impact according to quality classification. The results of the review are summarized in a matrix in Figure 7. As the matrix shows eight areas of quality apply to maintenance activities and the extent of application is based solely on equipment or component classification rather than extent of repairs. To date, the pilot program for the separations facility has had 84 percent of the equipment classified with PS class and 8 percent each with NS/CP or GS class. The result properly focused attention on repair or replacement of those components important to safe operation of the site.

Types of Work Packages

The work packages used prior to the pilot program consisted simply of a copy of the maintenance work request, and, if available, a blank set of work instructions, in a manilla folder. Because of incomplete instructions, the mechanic could not complete assigned tasks. The pilot program has a system of four work package types, each used for a different category of activity, each color coded, and each arranged in a user friendly document package. The four types are described below:

Modifications/Additions Package (MAP)

Most comprehensive work package assembled. Involves change or modifications to a facility's baseline design.

Emergency Maintenance Package (EMP)

Least comprehensive work package assembled. Used for Priority 1 work in which there is insufficient time to assemble a complete work package. Work performed under this work package is corrective maintenance or troubleshooting-type work and does not involve modification or addition to a facility's design baseline.

Preventive Maintenance Package (PMP)

Preventive maintenance involves maintenance performed to keep equipment/facilities in optimum operating condition. This maintenance may involve routine inspections, lubrications, or calibrations to major overhauls. Package contents involve routine/repetitive type work. The work package is authorized once upon its initial development. Subsequent packages can be used without authorization unless the preventive maintenance will require a lockout of a facility's system or may affect a facility's system. In that case, reauthorization is necessary. The work package is initiated by a computer-generated work request on a predetermined frequency.

Troubleshooting or Corrective Maintenance Package (TCMP)

Package contents involve routine/repetitive type work. The work package is authorized once upon its initial development. Subsequent packages can be used without authorization unless the maintenance performed will require the lockout of a facility's process or process support system or may affect a facility's process or process support system. In that case, reauthorization is necessary. The work package is initiated each time it is needed by an individual work request.

A section in each work package includes a sealed, plastic insert with those documents necessary for hands-on work in the field. Primarily to limit the number of documents entering a radiologically controlled area, this feature has helped control important documents by lessening exposure to potential contamination.

Job Plan

Prior to the pilot program, the only real planning done prior to a job was in the area of parts availability. The pilot program developed a job plan form, shown as figures 8, 9, and 10, which allows a maintenance planner to walkdown a job, verify equipment nameplate

information, establish criteria for job execution, and develop a bill of materials. The job plan has been helpful in identifying all known resources and requirements, and in making those available prior to beginning a job. Identification is especially important in high radiation work fields.

Shift Release

A requirement was added to have shift-by-shift release of work by the designated facility operations manager. A member of the maintenance planning group receives signature approval at the start of each shift for scheduled work to begin during the period. The approval is documented on page 4 of the maintenance work request as shown in Figure 6. This system establishes control and accountability for facility operations and support to the designated manager in charge.

Person-in-Charge

A second method of establishing accountability is the evolution of a person--in-charge (PIC) concept. Each maintenance work request is now assigned a person responsible for successfully executing the work, and subsequently testing and documenting the activity. The designate can change based on the type and extent of work. For example, maintenance first-line supervisors are usually the PICs for preventive maintenance work and systems engineers the designated PICs for system modifications. Overall, the system lends credibility to each authorized maintenance task.

Scheduling

The prior system of scheduling maintenance work was more of a day-to-day, crisis management response plan. Daily schedules were developed one day in advance and issued using a word processor spreadsheet. The pilot program uses Primavera Finest Hour software through a Lotus 1-2-3 spreadsheet to support a frozen weekly schedule, dynamic daily schedules, and a frozen monthly periodic preventive maintenance schedule. Scheduling is based on a job priority established by the equipment custodian, with tiebreakers being the designated quality classification. Only those work packages with a "ready-to-work" status are scheduled on a plan of the week and subsequent plan of the day basis. An emergency job priority system is in place to supersede the weekly and daily schedules, but is used only if one of four preapproved criteria per DOE Order is exceeded.

Work Package Changes

A work package change request form is used for approved work packages that cannot be worked as planned because of a change in field conditions, inadequate documentation, etc. The forms ensure that the packages are revised and reapproved before work is continued. The form also documents deviations from or modifications to an original work package. The approval for these changes is received from the PIC or the entire prework package review team, based on a graded approach dependent upon the quality classification of the equipment.

Shift Planner

A maintenance planner was added to each rotating four-shift in alignment with the operations shift schedule. This was done primarily to improve response time on offshift hours for emergency maintenance work package preparation, but also to assist in customer support for the work control process.

Service or Construction Contracts

The pilot program includes all work originated from a maintenance work request, regardless if the work is actually done by plant maintenance or subcontracted to a construction craft force or to a vendor. The same ten principles of the work control process apply in all cases.

Document Control Center

A 450-square-foot, interim-records-document-control-controlled area was established within the work control center to manage work packages, blueprints, work procedures, and other controlled documents necessary for effective maintenance planning. The document center provides ready access to planners, first-line supervisors, and systems engineers in providing maintenance and engineering support for Separations facility equipment.

Equipment Walkdowns

Prior to initiating the Work Control pilot program, it was recognized that an inadequate equipment records and history database existed. This inadequacy was accentuated by an inconsistent equipment numbering system and ineffective labeling program. A pilot Work Control program would only be as successful as the equipment records, history, labeling, and numbering system would allow. Therefore, a parallel equipment walkdown program was established to support implementation of the Work Control process. The elements of the walkdown program are: field verification of nameplate equipment data, resolution of missing data via engineering research, component identification and numbering, equipment labeling, and entry of data into the site computerized maintenance management WMS system. The program mirrors the master equipment list development in Chapter 4 of the INPO Conduct of Maintenance Guidelines.

Equipment walkdowns 221-H and 211-H will be used to update incomplete WMS information, to assign new equipment numbers per the new site nomenclature system, and to assign quality classifications per the site *Quality Assurance Manual*.

The process begins with the actual field walkdown using a data collection sheet in which nameplate data and additional information are collected from the field by three mechanics (one maintenance, one electrical, and one power mechanic) per the SRS *Equipment and Spare Parts Data Collection Rulebook*. For instrumentation, field information is entered into a Loveland M&TE database. Also, equipment numbers are assigned by loop rather than individual instrument, and preventive maintenance cards are generated by loop number. An engineer contractor locates information that is not readily found in the field by searching prints, manuals, custodian files, etc., and records it on the data collection sheet. The contractor then transfers the information from the data collection sheet to an equipment record form and to other appropriate data entry forms. After the engineering contractor assigns a new equipment number using site equipment nomenclature procedures, technical

support personnel verify the quality classification and forward the equipment record form and the data entry forms to the area controller. Then the area controller enters the information into WMS and equipment is tagged or labeled with newly assigned numbers. Finally, data collection sheets are filed and used to develop further maintenance plans and procedures.

Oversight

Several resources were secured to ensure that the work control process was successful. First, a consultant with over 25 years' experience in nuclear industry maintenance planning, scheduling, reliability engineering, spare parts, etc., was contracted primarily to provide technical oversight and to assess the overall effectiveness of the program as it relates to INPO criteria, work control principles, maintenance support, etc., thereby suggesting improvements to strengthen the pilot program before the division adopts it. A shift advisor program began in October 1990 in the Separations Operations group; its purpose was similar to the work control consultant. Shift advisors will also oversee the pilot program implementation. Thirdly, the Productivity Improvement Department at Savannah River Site is using cost-time profiles to evaluate delay time in the ten-step work control process, focusing on the work package preparation and work package prework review steps. Results should improve overall efficiency and response time. Lastly, performance indicators were developed to measure and trend the work control process during the pilot period, thereby focusing on areas needing attention. It was these indicators, after three months in use, which led to soliciting help from the Productivity Improvement group in the areas described above.

BENEFITS TO MAINTENANCE PROGRAM

Indications that the new work control process has improved operations are evident in several areas already. The first is in configuration management. All maintenance work is now documented and controlled on an item-specific basis. A second area is in post-maintenance testing. The process now requires post-maintenance testing commensurate with the quality classification of the equipment and extent of repair. The periodic preventive maintenance program is achieving near 100 percent compliance with monthly schedules and INPO requirements. Equipment records in WMS are being completed to provide necessary history and information for the job planning. The maintenance work procedures are being upgraded to meet quality and INPO standards, and lastly, accountability for job performance has improved with the initiation of a person-in-charge (PIC) concept for each maintenance activity.

KEY LEARNINGS

The development of the work control process has been a continual learning process as well. Evolution has been from a simple daily maintenance scheduling process to that of a systematic, ten-step, fully controlled maintenance planning and scheduling system that is truly in support of the site configuration management program. Along the way, many lessons learned have surfaced that would benefit those attempting to undertake a similar effort.

Planning

PLAN! PLAN! PLAN! This cannot be overemphasized. Studying all of the issues, and detailing each process development area are essential to success. Start early and monitor continuously.

Procedures

Maintenance work procedures or work instructions must be of a quality standard to complement the work control process, otherwise developing adequate procedures becomes the critical path item.

Equipment Walkdowns

Establishment and verification of a complete database of equipment nameplate data and history, and a consistent numbering and labeling system are essential for successful control of future repairs.

Training

Focus on the entire organization. Orient everyone to the overall process, train by function on the details, and seek professional help for specific duties such as maintenance planning. Ensure a thorough understanding of the process prior to implementation.

Management Support

Management's support is vital to survival. Early and continual exposure to the program will ensure its success. Involving a cross-cut of the entire facility organization in development and implementation of the process is important to ensure buy-in at lower levels of the business.

Planner Skills

The best planners are mechanics who have facility experience, a firm technical base, organizational ability, and good communications. All four traits are helpful in job-planning and work-package preparation. Supplementing the planning staff with experienced engineers and nuclear industry planners is beneficial.

Cost to Incremental Benefit

Allocate resources to the areas of the process that relate directly to the rate of return from that investment. This may vary between organizations. The pilot program is still too early in implementation to offer a judgment here.

Preventive Maintenance

Get control of the work control process by placing emphasis on establishing the periodic preventive maintenance program first. It is important to improve work procedures, post-maintenance testing, and spare-parts availability applied to the preventive maintenance program upfront while the details of the corrective maintenance program are resolved. An experienced systems engineering staff will help expedite this program.

Mechanic Efficiency

Be prepared for less "wrench time" in the early stages of implementation, as little as zero percent utility on some days. Mechanics can be temporarily reassigned to help prepare work packages for generic, routine tasks and to expand the backlog of available work. The utility should increase to 40-50 percent within 8 to 10 weeks of startup.

Startup Staffing

The startup maintenance planning staff will be at least 10-25 percent higher than the steady state staffing after full implementation. The "ramp up" additional staffing is necessary to prepare generic work packages, upgrade existing work procedures, and establish the preventive maintenance program.

Computerized Maintenance Management

Many computerized maintenance management packages exist in industry. Most are capable of supporting the basic needs of the maintenance and operations organizations. The system of choice should be fully utilized for equipment records, job planning, history, root-cause analysis and failure trending, parts procurement, and work procedures. Testing to ensure compliance with minimum requirements and ease of reprogramming to meet user requests are also important. Uptime of 22-23 hours average per seven-day workweek is necessary for continued facility operation.

SUMMARY

This paper has summarized the key features, benefits and lessons learned during implementation of an INPO-based Work Control process in a chemical Separations facility. Although lengthy and difficult to implement, the process can pay dividends by effective control, testing, and documentation of maintenance work activities. The best management practices of a maintenance work control process as given per INPO are applicable regardless if they are applied verbatim to a nuclear reactor or in concept to a multiphased chemical plant. The initial investment is high, but the long-term return is worth the effort. An effective work control process supports the basis for a site configuration management program.

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10. QAP 3–1, *Design Control*
11. QAP 7–1, *Graded Procurement System*
12. QAP 11–1, *Test Control*
13. QAP 14–1, *Inspection, Test, and Operating Status*

Updated: 5/31/90

ITEM	4B/90	5A/90	5B/90	6A/90	6B/90	7A/90	7B/90	8A/90	8B/90
PIP MILESTONE	DRAFT PROCEDURES READY AND FULL STAFFING	CONTINUE STAFFING	CONTINUE STAFFING	FINALIZE STAFFING/ BEGIN TRAINING ON PROGRAM	COMPLETE TRAINING ON PROGRAM/BEGIN IMPLEMENTATION OF PROGRAM	FULL SCALE PILOT IN CANYON/OFF			
PEOPLE		1 QA	2 AMO Engineers 1 Separations 2 QA 1 Separations Engineering	1 Health Protection	3 Proc. Writers 2 Separations 4 Naval Fuels 2 Separations Engineering 5 Clerical (Canvas for Shift Planners)	5 Cog. Sys. Engineers	1 Naval Fuels 1 SRL		
PROCEDURES	Drafts of: 291–051, 052, 053, 054, 055, 057, 059, 062, 068 Site WC Procedure MP/MRP Drafted	Drafts of: 291–060, 061, 064	Approvals of Procedures in Draft on 4B & 5A/90 Drafts of: Site WC Manual QA Review of Packages ST Review of Packages HP Review of Packages 291–058, 070, 072	Approvals of Procedures in Draft on 5B/90 MP/MRP Approved Drafts of: 291–056, 073, 074 291–901b Site WC Manual – SE Comments	Approvals of Procedures in Draft on 6A & 6B/90 Drafts of: 291–010, 063, 071 Site WC Manual – PMT Comments	Drafts of: Scheduling Software Quality Plan Planners User's Manual Site WC Manual – Reactor Comments	Scheduling Software Quality Plan Planners User's Manual approved Site WC Manual – Site Comments	Site WC Manual Site Comments	Site WC Manual Site Comments
PROGRAMS		Begin Equipment Walkdown Preparations Identify WMS Fields required for Scheduling Program	Begin Equipment Walkdown and Safety Classifications Begin PM Package Preparation for Pilot Groups	Write extraction program to pull fields from WMS for Schedules	Begin writing Primavera Program for custom Schedule Formats Complete program on Schedule formats	Begin Pilot Program phase in – 7/2: • All WG begin using new MWR, Tagging, Work Packages, New Classifications 7/2 – 7/16: • Prepare packages for UR, RO, SHR Work	Pilot Program Status: 7/16 – Full Compliance 1 work group ex. sched. 7/23 – Full Compliance 1 work group 7/30 – Full Compliance all WG ex. sched.	8/6 – Full Compliance all work groups including Daily and Weekly Scheduling	9/3 – Monthly, Annual, Scheduling
FACILITIES			Move Misc. People from 704–H to 707–H COD Complete on 724–H Complete Scope of Work on 704–H remodeling	Order Materials for 724–H & 704–H Renovations	Begin Renovation of 704–H WC Pilot Area & 724–H Building	Continue 704–H WC Pilot Area Renovation and 724–H Office Renovation	Complete 704–H WC Pilot Area Renovation & 724–H Offices Move 704–H SE Personnel to 724–H		
MISC. ITEMS		Received 16 IBM Computers	Finalize WC Temp Document Control Ctr. System Relocate Kit Bldg.	Duplication Machine, Office Furniture & modules, Print Reduction Machine due in to WC. WC Consultant Contracted	WMS Revision #65 & Impact Level Programming to be completed or alternative fields considered	WC Consultant Orientation	WC Consultant Assessment begins		
TRAINING		Develop Training Plan	Managers Reviews on Pilot Program	Orientations to Pilot Participants on Program	Training on Pilot Procedures to Participants	Continue Training on Pilot Procedures to Participants DOE Review of Pilot Program	Continue Training on Pilot Procedures to Participants	Planner/Scheduler Job Specific Training	Planner/Scheduler Job Specific Training

Figure 1. Work Control Pilot Program Statistics

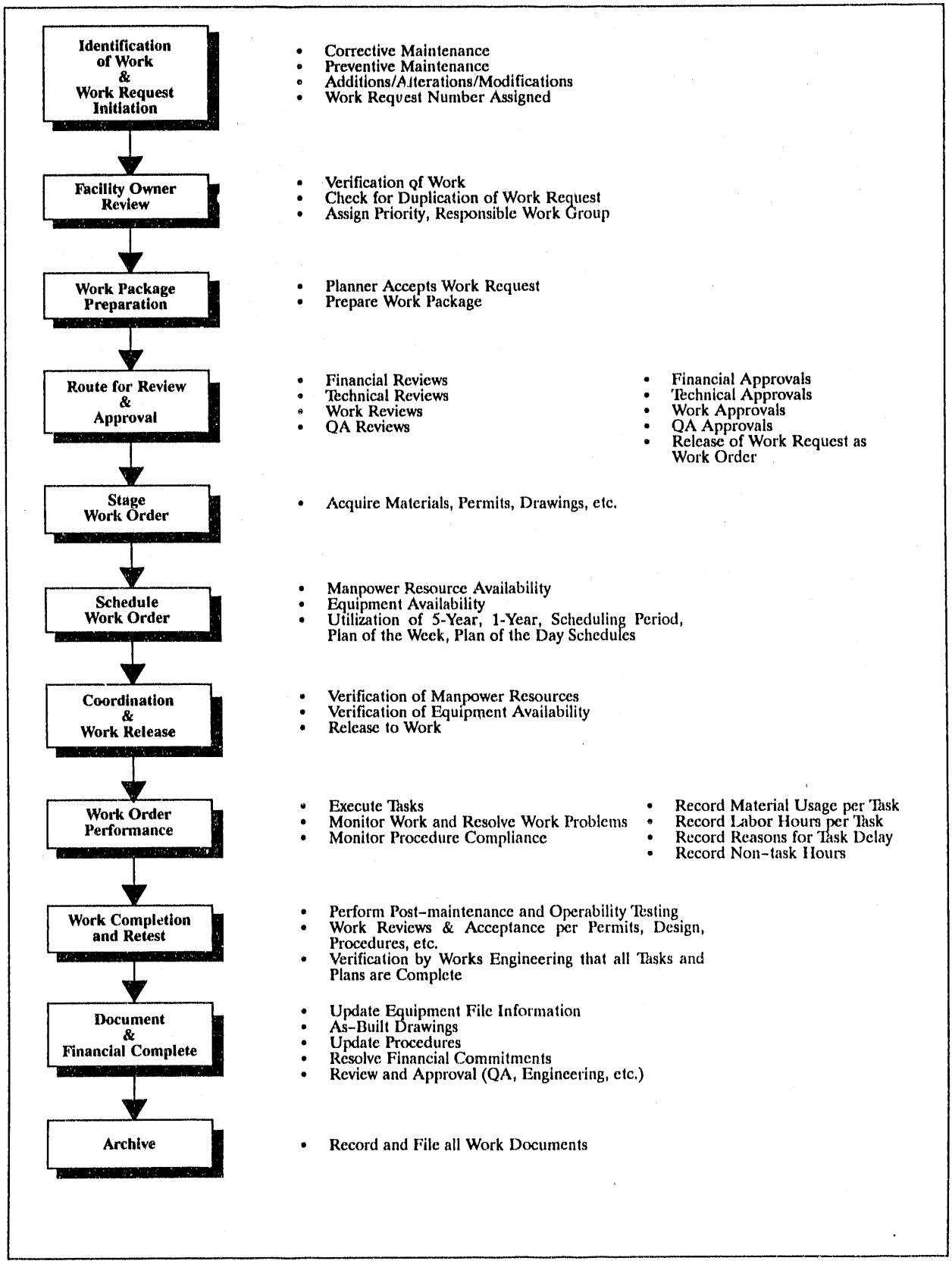

Figure 2. Work Control Process Flowchart

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Maintenance Work Request

1. WR No. _____ Deficiency Tag No. _____ Deficiency Tag Hung ☐ Yes ☐ N	2. Tracking No. ☐ N/R	3. AMO No. ☐ N/R	4. Date	5. Work Group
6. EP/EN	7. IDP No.	8. Equipment Noun Name/Plant System		9. Location (Bldg/Area)
10. Job Title				
11. Description of Defect/Problem or Work Requested				
12. Initiator	13. Phone	14. SS No.		15. Priority
16. Permits Required WCP ☐ Yes ☐ No	16A. SCDHEC ☐ Yes ☐ No	16B. Work in Radiological Controlled Area ☐ Yes ☐ No RWP No. _____ SRWP No. _____		17. Print Revision ☐ Yes ☐ No
18. Work Class	19. Work Type	19A. Minor Maintenance ☐	20. Quality Class	

Minor Work Validation N/R ☐			
21. N/R ☐ Operation Approval	SS No.	Authorization Level	Date
21A. N/R ☐ Power Operation Approval	SS No.	Authorization Level	Date
21B. N/R ☐ Work Control	SS No.	Authorization Level	Date

Major Work Validation N/R ☐			
22. N/R ☐ Operation Approval	SS No.	Authorization Level	Date
23. N/R ☐ Power Operation Approval	SS No.	Authorization Level	Date
24. N/R ☐ Technical Approval	SS No.	Authorization Level	Date
25. N/R ☐ Technical Approval	SS No.	Authorization Level	Date
26. N/R ☐ Implementing Group Approval	SS No.	Authorization Level	Date

Work Estimates N/R ☐			Area Controller N/R ☐	
27. Contract Group	28. Est. Hours	29. Est. Mat'l. Dollars	37. Davis Bacon Act	38. Auth. Limit Code
30. Subcontract	31. Est. Hours	32. Est. Mat'l. Dollars	39. Initials	40. Overriding
33. Subcontract	34. Est. Hours	35. Est. Mat'l. Dollars	41. Inspection Required ☐ Yes ☐ No	
36. Total Dollars			42. PET Required ☐ Yes ☐ No	

Construction Estimate N/R ☐			
43. Labor ($)	Materials ($)	FIC ($)	Total ($)

44. Construction Approval	SS No.	Authorization Level	Date
45. Area Maintenance Manager's Approval	SS No.	Authorization Level	Date

Figure 3. Maintenance Work Request, OSR 7–975, Page 1 of 4

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Minor Maintenance

(For Minor Maintenance Only as Noted in 19A)

Work Release			
N/R ☐ OPS Manager	SS No.	Authorization Level	Date
N/R ☐ Power OPS Manager	SS No.	Authorization Level	Date
Implementing Work Group Supervisor	SS No.	Authorization Level	Date
Work Acceptance			
N/R ☐ OPS Manager	SS No.	Authorization Level	Date
N/R ☐ Power OPS Manager	SS No.	Authorization Level	Date

Work Performance		
Total Regular SE Manhours Worked	Total Overtime SE Manhours Worked	Total Estimated Material Costs

History N/R ☐

Condition (As Found)

Repairs Performed

Condition (As Left)

Figure 4. Minor Maintenance Form, OSR 7-975, Page 2 of 4

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Page 4 of 4

A B C

Work Release/Partial Release Addendum

Work Request No.

Work Release	Job Task Sequence No. for Partial Release	SS No.	Authorization Level	Date
54. N/R ☐ OPS Manager				
55. N/R ☐ Power OPS Manager				
56A. N/R ☐ Implementing Work Group Supervisor				
56B. N/R ☐ Implementing Work Group Supervisor				
56C. N/R ☐ Implementing Work Group Supervisor				
Comments				

Work Release	Job Task Sequence No. for Partial Release	SS No.	Authorization Level	Date
54. N/R ☐ OPS Manager				
55. N/R ☐ Power OPS Manager				
56A. N/R ☐ Implementing Work Group Supervisor				
56B. N/R ☐ Implementing Work Group Supervisor				
56C. N/R ☐ Implementing Work Group Supervisor				
Comments				

Work Release	Job Task Sequence No. for Partial Release	SS No.	Authorization Level	Date
54. N/R ☐ OPS Manager				
55. N/R ☐ Power OPS Manager				
56A. N/R ☐ Implementing Work Group Supervisor				
56B. N/R ☐ Implementing Work Group Supervisor				
56C. N/R ☐ Implementing Work Group Supervisor				
Comments				

Work Release	Job Task Sequence No. for Partial Release	SS No.	Authorization Level	Date
54. N/R ☐ OPS Manager				
55. N/R ☐ Power OPS Manager				
56A. N/R ☐ Implementing Work Group Supervisor				
56B. N/R ☐ Implementing Work Group Supervisor				
56C. N/R ☐ Implementing Work Group Supervisor				
Comments				

Figure 6. Work Release/Partial Release Addendum, OSR 7–975, Page 4 of 4

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Maintenance Work Order

Work Package Approval			
46. Planning Manager	SS No.	Authorization Level	Date
47. N/R ☐ Engineering	SS No.	Authorization Level	Date
48. N/R ☐ Technical	SS No.	Authorization Level	Date
49. N/R ☐ Technical	SS No.	Authorization Level	Date
50. N/R ☐ Quality	SS No.	Authorization Level	Date
51. N/R ☐ HP	SS No.	Authorization Level	Date
52. N/R ☐ Implementing Work Group	SS No.	Authorization Level	Date
53. N/R ☐ Other	SS No.	Authorization Level	Date
Work Release (Total Job)			
54. N/R ☐ OPS Manager	SS No.	Authorization Level	Date
55. N/R ☐ Power OPS Manager	SS No.	Authorization Level	Date
56. N/R ☐ Implementing Work Group	SS No.	Authorization Level	Date
Work Completion			
57. Housekeeping Returned to Normal ☐ Yes ☐ No			
58. N/R ☐ Implementing Work Group	SS No.	Authorization Level	Date
Post Maintenance Testing			
59. N/R ☐ Implementing Work Group	SS No.	Authorization Level	Date
60. N/R ☐ Engineering	SS No.	Authorization Level	Date
Functional Testing			
61. N/R ☐ OPS Manager	SS No.	Authorization Level	Date
62. N/R ☐ Power OPS Manager	SS No.	Authorization Level	Date
Work Acceptance			
63. N/R ☐ OPS Manager	SS No.	Authorization Level	Date
64. N/R ☐ Power OPS Manager	SS No.	Authorization Level	Date
Work Package Review and Closeout			
65. N/R ☐ Implementing Work Group	SS No.	Authorization Level	Date
66. N/R ☐ Engineering	SS No.	Authorization Level	Date
67. N/R ☐ Technical	SS No.	Authorization Level	Date
68. N/R ☐ Technical	SS No.	Authorization Level	Date
69. N/R ☐ Quality	SS No.	Authorization Level	Date
70. N/R ☐ HP	SS No.	Authorization Level	Date
71. N/R ☐ Other	SS No.	Authorization Level	Date
Work Package Closeout			
72. Work PackageCoordination Supervisor	SS No.	Authorization Level	Date

Comments Issued to Planner/ Scheduler/Material Coordinator ☐ Yes ☐ No	PCR Issued ☐ Yes ☐ No	Print Revision Issued ☐ Yes ☐ No	History Reviewed ☐ Yes ☐ No	WP Closeout In WMS ☐ Yes ☐ No

Planning Manager	SS No.	Authorization Level	Date

Figure 5. Maintenance Work Order Form, OSR 7-975, Page 3 of 4

QA DESIGN CLASSIFICATIONS PLANNING MATRIX
(Graded Approach to Major Maintenance)

Quality Assurance Elements		Design Classifications (QAP 2–1)			
		NS	CP	PS	GS
QAP 3–1	Design Control				
	DOE Order 6430.1A Safety Classification	SC	SC	nSC	nSC
	SAR Safety Classification – Existing Facility nSR	SR	SR		
	As-Built Print Closure	6 mon.	6 mon.	N/A	N/A
QAP 4–1/7–1	Procurement Document Control Graded Procurement System	1 or 2	1 or 2	1 or 2	2 or 3
QAP 5–1	Procedures and Instructions SE Procedures Category (SOP 291–905)	1 or 2	1 or 2	1 or 2	3 or N/A
QAP 6–1	Work Package Review and Approval				
	Technical (SOP 14–1)	YES	YES	NO	NO
	Quality (SOP 207–1)	YES	YES	YES	NO
	CCB (SOP 221–H 727)	MD/AD	MD/AD	NO	NO
	Cognizant Engineer (SOP 291–054)	YES	YES	YES	NO
QAP 10–1	Inspections QV Inspections Required (SOP 207–1)	Ind. QV	Ind. QV	Peer	Self
QAP 14–1	Test Control Post-maintenance Testing (SOP 291–055)	YES	YES	YES	NO
QAP 15–1	Nonconforming Items NCR Closure	30 days	30 days	6 mon.	N/A

Figure 7. QA Design Classifications Planning Matrix

QA DESIGN CLASSIFICATIONS PLANNING MATRIX
(Graded Approach to Major Maintenance)

Quality Assurance Elements		Design Classifications (QAP 2-1)			
		NS	CP	PS	GS
QAP 3-1	Design Control				
	DOE Order 6430.1A Safety Classification	SC	SC	nSC	nSC
	SAR Safety Classification - Existing Facility	SR	SR		
	nSR				
	As-Built Print Closure	6 mon.	6 mon.	N/A	N/A
QAP 4-1/7-1	Procurement Document Control Graded Procurement System	1 or 2	1 or 2	1 or 2	2 or 3
QAP 5-1	Procedures and Instructions SE Procedures Category (SOP 291-905)	1 or 2	1 or 2	1 or 2	3 or N/A
QAP 6-1	Work Package Review and Approval				
	Technical (SOP 14-1)	YES	YES	NO	NO
	Quality (SOP 207-1)	YES	YES	YES	NO
	CCB (SOP 221-H 727)	MD/AD	MD/AD	NO	NO
	Cognizant Engineer (SOP 291-054)	YES	YES	YES	NO
QAP 10-1	Inspections QV Inspections Required (SOP 207-1)	Ind. QV	Ind. QV	Peer	Self
QAP 14-1	Test Control Post-maintenance Testing (SOP 291-055)	YES	YES	YES	NO
QAP 15-1	Nonconforming Items NCR Closure	30 days	30 days	6 mon.	N/A

Figure 7. QA Design Classifications Planning Matrix

(WPD-2-Pilot)

JOB PLAN SHEET				
Work Request #: _____	Date: _____		Work Group #: _____	
Job Title: _____				
Person in Charge: _____			Telephone #: _____	
Manpower Key				
Maintenance - M	Construction - C	Electrical - E	Health Protection - H	Rigging - R
Engineering - En	OPS Standby - S	Machinists - Ma	Equipment Custodian - EC	Vendor - V
JOB PLAN				
Prerequisites: Job Preplan:				
ALARA Considerations:				
Notifications:				
Support Groups:				

TASK	Respon-sibility	Time (hrs.)	Confirm. Initials
1)			
2)			
3)			
4)			
5)			

Figure 8. Job Plan Sheet, OSR 7-997, Page 1 of 3

(WPD–2A–Pilot)

JOB PLAN CONTINUATION SHEET			
JOB PLAN:			
TASK	Respon–sibility	Time (hrs.)	Confirm. Initials
6)			
7)			
8)			
9)			
10)			
11)			
Acceptance Criteria/Testing:			
Comments/Status: (SE–Line)			

Figure 9. Job Plan Sheet, OSR 7–997, Page 2 of 3

(WPD-2B-Pilot)

JOB PLAN CONTINUATION SHEET

Work Request #: _____

Drawing References

_____ _____ _____ _____

Materials List

Quantity	Description
1) _____	_____
2) _____	_____
3) _____	_____
4) _____	_____
5) _____	_____

Tools

_____

_____

Special Requirements

ESR Required:	☐Yes ☐No (#:)	Ventilation Work:	☐Yes ☐No
Radiological Area:	☐Yes ☐No (#:)	Welding Required:	☐Yes ☐No
Scaffolding Required:	☐Yes ☐No (#:)	WCP Required:	☐Yes ☐No
Asbestos Removal:	☐Yes ☐No (#:)	Fire System Affected:	☐Yes ☐No

Additional Remarks/Notes

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Job Plan Prepared By: _____ Telephone: _____

SSN: _____ Date: _____

Figure 10. Job Plan Sheet, OSR 7-997, Page 3 of 3

END

DATE
FILMED
4 129 92