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Westinghouse Hanford Company Conduct of Operations Manual

GOCO Cross-Cultivation Committee...

Operational Excellence Task Force

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Assistant Secretary for Defense Programs

Westinghouse
Hanford Company

P.O. Box 1970
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**WESTINGHOUSE HANFORD COMPANY CONDUCT
OF OPERATIONS MANUAL**

PREFACE

The Westinghouse Hanford Company is committed to uncompromising integrity and adherence to the highest standards of safety, quality, environmental sensitivity, and excellence in the conduct of operations. To support this commitment all employees must have a clear understanding of our standards for the conduct of operations.

This manual is the result of work by the Westinghouse Electric Company GOCO Cross-Cultivation Committee. It reflects the high standards we share with the other DOE sites that face many of the same challenges as we do here at the Hanford Site.

Our customer's emphasis and demand for disciplined, safe, and effective operations is nothing new to us. The Hanford Site has a significant history of challenges that have been met, and we will continue to succeed with the challenges remaining before us. The guidance in this manual explains how.

Every manager must have a firm grasp of the ideas in this manual. Distilled from long experience in nuclear operations, the information in this manual forms a basic curriculum in how to manage complex technical operations, regardless of their nature. While many of the conduct of operations lessons were learned from our work in nuclear operations, the underlying principles apply equally to operation of a process stream, data process network, sample laboratory, motor pool, or remediation site.

In every case, excellence in our operations depends on alert, trained employees who know their jobs and take ownership to prevent big problems from occurring while aggressively pursuing small problems to correction. We have excellence in operations when we refuse to settle for the easy answer and, instead, follow up when something "doesn't sound right."

A questioning attitude is the key asset for sound operation of any facility, program, or project. This attitude, combined with employee empowerment and management support, forms the basis for outstanding conduct of operations.

While conduct of operations standards are not always easy to implement, it is clear that we must implement them. I am confident that we will continue to achieve and surpass these demanding standards as the Hanford Site becomes the model for environmental excellence in the DOE complex.

Approved by:

Tom Anderson, President
Westinghouse Hanford Company

8/14/92
Date

Implementation Notice

**WHC-SP-0708, *Westinghouse Conduct of Operations Manual*
Release 2, Effective January 1, 1994**

Release 2 incorporates revision 1 to the Westinghouse GOCO Conduct of Operations Manual directly into WHC-SP-0708. This revision clarifies some sections, makes editorial corrections, and adds additional material that was not included in the original release. The manual was revised by representatives to the Westinghouse GOCO Conduct of Operations Council, the Westinghouse Government Operations Business Unit (Westinghouse Hanford Company, Westinghouse Waste Isolation Division, Westinghouse Idaho Nuclear Company, and West Valley Nuclear Services Company), and the Westinghouse Savannah River Company.

<u>Number</u>	<u>Title</u>	<u>Rev</u>	<u>Effective Date</u>	<u>Resp Org</u>
	Preface	0	8/12/92	OPS/OMI
	Foreword	1	1/1/94	OPS/OMI
	Introduction	1	1/1/94	OPS/OMI
Chapter 1	Operations Organization and Administration	1	1/1/94	OPS/OMI
Chapter 2	Shift Routines and Operating Practices	1	1/1/94	OPS/OMI
Chapter 3	Control Area Activities	1	1/1/94	OPS/OMI
Chapter 4	Communications	1	1/1/94	OPS/OMI
Chapter 5	Control of On-Shift Training	1	1/1/94	OPS/OMI
Chapter 6	Investigation of Abnormal Events	1	1/1/94	OPS/OMI
Chapter 7	Notifications	1	1/1/94	OPS/OMI
Chapter 8	Control of Equipment and System Status	1	1/1/94	OPS/OMI
Chapter 9	Lockouts and Tagout	1	1/1/94	OPS/OMI
Chapter 10	Independent Verification	1	1/1/94	OPS/OMI
Chapter 11	Logkeeping	1	1/1/94	OPS/OMI
Chapter 12	Operations Turnover	1	1/1/94	OPS/OMI
Chapter 13	Operations Aspects of Facility Chemistry and Unique Processes	1	1/1/94	OPS/OMI
Chapter 14	Required Reading	1	1/1/94	OPS/OMI
Chapter 15	Timely Orders to Operators	1	1/1/94	OPS/OMI
Chapter 16	Operations	1	1/1/94	OPS/OMI
Chapter 17	Operator Aid Postings	1	1/1/94	OPS/OMI
Chapter 18	Equipment and Piping Labeling	1	1/1/94	OPS/OMI
	Glossary	1	1/1/94	OPS/OMI

WESTINGHOUSE CONDUCT OF
OPERATIONS MANUAL

Manual
Section Table of Contents, Rev 1
Page 2 of 2
Effective Date January 1, 1994

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FOREWORD

The Conduct of Operations Manual has been prepared to establish standards that are to be used at all Westinghouse Government Operations Business Unit (GOBU) sites and Westinghouse Savannah River Company (WSRC). These standards comply with the requirements of Department of Energy (DOE) Order 5480.19, "Conduct of Operations Requirements for DOE Facilities" and they will be used at all Westinghouse Government Operations Business Unit sites and Westinghouse Savannah River Company.

The manual was compiled by implementing DOE Order 5480.19 and implementing procedures from the Westinghouse Government Business Unit sites, Westinghouse Savannah River Company, and other best industry practices. For each chapter of the manual, the best features were selected from each organization's implementing procedure. "Example" attachments appear in various sections throughout the manual to serve as additional guidance for implementation of the DOE Order. A glossary of terms and their definitions were established in the same manner. This compilation method sought to achieve a manual which represents the "best of the best."

The manual is organized to follow the eighteen chapters of DOE Order 5480.19 in sequence and supplements the requirements of the DOE Order to provide uniform and consistent compliance with the DOE Order. The manual was developed and revised by representatives to the Westinghouse GOCO Conduct of Operations Council, the Westinghouse Government Operations Business Unit, (Westinghouse Hanford Company, Westinghouse Waste Isolation Division, Westinghouse Idaho Nuclear Company; and West Valley Nuclear Services Company) and the Westinghouse Savannah River Company.

Revision 1 to the Government Owned Contractor Operator (GOCO) Conduct of Operations manual is effective September 1, 1993, Revision 1 to this manual, WCH-SP-0708, is effective January 1, 1994 and shall serve as the basis for implementation of DOE Order 5480.19.

**WESTINGHOUSE CONDUCT OF
OPERATIONS MANUAL**

**Manual
Section
Page
Effective Date**

**WHC-SP-0708
Foreword, Rev 1
2 of 2
January 1, 1994**

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INTRODUCTION

Westinghouse Government Owned - Contractor Operated Facilities Conduct of Operations Operating Philosophy.

"Conduct of Operations" is a set of standards which establishes an overall philosophy for achieving excellence in the operation of DOE facilities. These standards have application in many facets of our business and shall be considered by each organization that conducts or supports Operations in their efforts to improve overall organizational performance. The formality and accuracy resulting from the implementation of the elements of this manual will enhance safe operations and result in a higher quality product. The elements of the Conduct of Operations Requirements for DOE Facilities (DOE 5480.19) are tools to do our work. In like manner the tools and methods given in the Maintenance Management Program (DOE 4330.3A) are complementary and are to be used to the fullest. These DOE documents taken together and integrated into site implementation provide the framework for well operated facilities committed to excellence and not just compliance. The goal of this manual is to promote greater ownership and accountability by each individual worker and supervisor. Evidence of our success will include accountability by workers on the floor and in technical inquisitiveness at all levels. Striving for excellence involves all of us and we should not wait for someone else to find our problems.

Many believe that Conduct of Operations Requirements for DOE Facilities (DOE 5480.19) apply to only "Operations" personnel or organizations or to nuclear facilities. The principles and philosophy of this manual apply to many facets of any business. They apply to Maintenance, Engineering, Environmental Science, Radiation Protection, Waste Handling, Laboratories, Remediation, Quality Control, and other site organizations. They apply to incinerators and waste storage, treatment facilities, production and manufacturing, essentially to all segments of our business activity. The same formality and discipline is required for the process of sampling ground water for environmental monitoring and waste remediation as for sampling of reactor coolants. The same degree of formality and discipline are required for operating a tank farm as there is in operating a process line or laboratory.

The tools provided in this manual apply to all activities at our sites. The degree to which each one is applied is determined by the hazardous risk involved. This is referred to as a "graded approach." Of particular significance are the elements of Chapter 1, Organization and Administration, which apply to all activities. Also, all chapters apply to Maintenance, Environmental Science, Radiation Protection, Waste Handling, Laboratories, Remediation, and other site organizations. Certain elements of this manual may even apply to Cafeteria, Purchasing, Clerical, and Warehousing personnel. Each of the eighteen elements shall be reviewed for applicability for each of our facilities and work activities.

A graded approach is the application of the elements in sufficient depth of detail commensurate with the activity's importance and potential environmental, safety and/or health protection impact.

For example: The training required for an operator or maintenance craftsman for Chapter 9, Lockouts and Tagouts, would be very detailed and extensive. On the other hand, Lockout/Tagout training for a file clerk, cafeteria worker, or purchasing agent could be adequately covered by General Employee Training (GET).

Conduct of Operations is not solely a Manual or a DOE Order, it is an operating philosophy. All segments of our business must evaluate their activities and the tools of this manual and implement all of the elements in a graded approach. For those elements deemed not applicable, a rationale shall be documented for management review.

ABOUT THIS MANUAL

In each chapter of the manual, sidebars appear on the left margin of the pages that contain information which supplements DOE Order 5480.19. Future revisions to the manual will be designated by sidebars on the right margin of the pages that contain the revised information.

The Westinghouse Savannah River Company (WSRC) Nuclear Materials Processing Division (NMPD) Manager of Performance Improvement is the custodian of this manual. Any changes desired to this manual shall be submitted on a Change Request Form (see Chapter 16) to: Westinghouse Savannah River Company, P. O. Box 616, Aiken, SC 29802, Attention: NMPD Manager Performance Improvement - 703A-120.

1.0 PURPOSE

The organization and administration of operations shall ensure that a high level of performance in DOE facility operations is achieved through effective implementation and control of operations activities. Operations activities shall recognize that environment, safety, and productivity are compatible goals. DOE facility policies shall describe the philosophy of standards of excellence under which the facility is operated and clear lines of responsibility for normal and emergency conditions are established. Effective implementation and control of operating activities are primarily achieved by establishing written standards in operations, periodically monitoring and assessing performance, and holding personnel accountable for their performance.

This chapter provides guidelines to ensure all Westinghouse Government Operations Business Unit (WGOBU) sites and Westinghouse Savannah River Company (WSRC) operations are conducted in an effective and consistent manner in accordance with applicable U.S. Department of Energy Orders.

WGOBU and WSRC believe that operations are to be conducted in a manner such that the SAFETY OF THE PUBLIC, THE WORKER, AND THE ENVIRONMENT ARE PARAMOUNT and compatible with productivity.

Experience has shown that superior consistent performance is obtained from qualified personnel using approved procedures and where management is involved in work place monitoring and assessing performance. A key function of management is to train, teach, coach, and develop their personnel. If during off-hours situations arise where a supervisor may need additional guidance or counseling, they are encouraged to call their management for guidance.

Management must let their expectations be known by frequent, open, and free communication at all levels. Employees are encouraged to bring safety issues and solutions to management's attention. The staff of the facility is the most precious resource management has to deal with. All personnel should be held accountable for performance and all personnel shall be treated fairly and with respect. WGOCOs are stronger as a team than the sum of its components individually. By taking advantage of each of the individual facilities' strengths, learning from each others experience, borrowing and trading expertise, and sharing resources the Business Units' power is magnified and our customer, the DOE, and our country is better served. We want to do things in a high quality, standard manner as a team, helping each other do our jobs better, learning from each others experience, and supporting plant goals and objectives.

2.0 SCOPE

This chapter establishes the responsibilities, Westinghouse administrative guidelines, and requirements necessary for daily conduct of facility operations.

Excellence in operations is accomplished by establishing high operating standards by management, communicating operating standards to the workers, providing sufficient resources to the operations department, ensuring personnel are well trained, monitoring operating performance, and by holding workers and their supervisors accountable for their performance in conducting activities.

Senior management establishes operating standards taking employee input into consideration.

2.1 INPUT FROM WORKERS

Free and open communication between workers and management is encouraged. Every employee on a WGOCO site (this includes subcontractor personnel) is encouraged to bring any industrial, nuclear, or environmental safety concern to management's attention. Employee input to goals, standards and methods of performance is encouraged and expected. Input in writing is preferred, but verbal communications are acceptable. Input is to be made to the immediate supervisor, but if for any reason this is not acceptable, escalation is encouraged.

Standards are more eagerly supported when workers have had input into the development of those standards. The standards shall define operating objectives, establish expected performance levels, and clearly define responsibility in facility operations. Standards for operating activities shall also be integrated into operations department procedures and programs. Operating standards shall also be communicated to the working level by training workers in operating practices and by supervisory monitoring and guidance of work involving facility operations.

2.2 STANDARDS

Standards for certain elements for operational excellence are contained in this manual. These standards are prescriptively written and can be used as procedures. Additional standards may be developed on a site specific basis. Where appropriate, standards should be submitted to the WSRC GOCO Conduct of Operations Manual Coordinator for consideration by the GOCO Conduct of Operations Committee.

OPERATIONS ORGANIZATION AND
ADMINISTRATION (U)

Sufficient staff, equipment, and funding shall be allocated to permit the operations department to effectively perform its functions. Performance in operations shall be closely monitored by facility management.

Using a graded approach, workers will be trained using qualification standards appropriate to their job and "skill of the craft." The following Chapters include some of the standards which are to be used. Other appropriate standards may be developed and incorporated into this manual by the change form system.

Operating reports, performance indicators, and goals shall be used so that the performance of the Organization can be effectively measured. All personnel shall be held accountable for their performance through supervisory counseling, performance appraisals and, when necessary, disciplinary measures. Remedial training shall be provided when applicable.

2.3 TEAMWORK

The purpose of this section is to establish guidelines to be followed by personnel to ensure that important aspects of teamwork are met. The fundamental purpose of the facility is to provide goods and services to the DOE (our Customer) in a safe, high quality, timely, cost efficient manner. The only way this can be done is by the concerted efforts of each of us as a team. Working to support each other, anticipating each others needs. In today's world of demanding customers and compliance oriented regulators, the phrase "that is not my job" is obsolete. We each have a customer: a customer depends on you to do your job in a quality way. Quality is meeting all of your customers needs. We have to do our jobs safer, faster, cheaper and correctly the first time. We can only do that by supporting the next person or activity that depends on us. We must make their job easier so that we can all be successful as a team. We do this with respect and dignity toward each other.

Each organization has some part in the safe and efficient operation of the facility. Facility organizations are primarily responsible to provide Operations with the support and an environment which permits the facility to be operated at the expected high standards. For example, Engineering is responsible for the technical aspects of equipment and systems; that is, they issue drawings, specifications, and operational limits. Operations must operate within these specifications according to approved procedures. If Operations can not be conducted within these specifications, they must get Engineering resolution. Maintenance is likewise responsible for maintaining facility equipment, as designed or called for by Engineering, by implementation of the preventative and corrective maintenance programs, and so on with each organization. Each contributes to the safe and successful

operation of the facility. There is only one team at the facility, and all organizations are members. Success of one organization is success for all-failure of one organization is failure for all.

3.0 DEFINITIONS

WGOCO. Westinghouse Government Owned Contractor Operated Facilities. Operated by Westinghouse for the Department of Energy and includes WGOBU and WSRC.

WGOBU. Westinghouse Government Business Unit, comprising Westinghouse Hanford Company, West Valley Nuclear Services Company, Westinghouse Materials Company of Ohio, Westinghouse Idaho Nuclear Company, Waste Isolation Division

WSRC. Westinghouse Savannah River Company

4.0 RESPONSIBILITIES

All personnel are responsible for compliance with the provisions of this procedure.

Managers and supervisors shall ensure that all personnel under their direction are trained in regard to the conduct of operations as outlined in this procedure.

5.0 PROCEDURE

5.1 OPERATIONS POLICIES

Policies and procedures shall specify requirements that are to be applied to operations and support organizations. They shall specify goals, the means to achieve those goals, and provide for the controls necessary to ensure implementation. Responsibilities for implementing these policies, including the responsibility of shift personnel, shall be clearly defined. Operations personnel shall clearly understand their authority, responsibility, accountability, and interfaces with support groups.

5.1.1 Conservative Operation

It is the policy of WGOCO organizations that the primary consideration in the operation of all facilities is the SAFETY OF THE GENERAL PUBLIC, SITE PERSONNEL, THE ENVIRONMENT, AND PLANT EQUIPMENT. All operations personnel,

when faced with any abnormal plant condition, transient, or event ARE TO TAKE THE SAFE COURSE OF ACTION. CONSIDERATION OF MAINTAINING PRODUCTION IS SECONDARY.

It is the policy of WGOBU and WSRC that:

- Operating personnel shall ensure the safety of the general public by the proper operation and frequent monitoring of their equipment and facilities.
- Operations, maintenance and other activities shall be conducted in an orderly and professional manner in accordance with this manual.
- Personnel shall follow written procedures in a "thinking compliance" manner. Where procedures are used, they must be followed as written. If they cannot be followed or the worker believes they are wrong, the worker shall stop work and advise his/her supervisor.
- The term "graded approach" refers to the scope of application and detail of procedure content not whether deviations from a procedure are allowed. Procedure hierarchy is covered in Chapter 16 of this manual.
- The operating organizations covered by this manual will perform self assessments relating to operational standards at least annually.

5.1.2 Principles of Operations

A list of these PRINCIPLES OF OPERATIONS is provided in Attachment B. Studies of Industry Events disclose recurring errors which could have been avoided by operators adhering to one or more basic operations' principles.

5.1.3 Operating Expectations

- Managers and supervisors will make a best effort to spend 25-35% of their time in the working spaces outside of their offices. Managers set the example for their subordinates; do not set expectations for your subordinates you cannot meet.
- There will be "no shooting of the messenger," we will face the facts and deal squarely and honestly with bad news. Management's role is to be receptive to bad news, encourage subordinates to elevate problems, and provide feedback for allowing resolution.

5.2 RESOURCES

The operations supervisor for DOE facilities shall be provided with sufficient resources in materials and personnel to accomplish assigned tasks without requiring excessive overtime by the operations staff. These resources shall include technical personnel needed to support the operations. A long range staffing plan that anticipates personnel losses shall be developed and implemented.

Organization charts defining the operational line of authority and position descriptions defining the duties and responsibilities of each management and supervisory position identified by the organization charts shall be maintained and readily available.

5.3 OVERTIME

Adequate shift coverage must be maintained without the heavy use of overtime. Use of overtime to cover vacations should be avoided. However, in the event that unforeseen problems require substantial amounts of overtime to be used (such as emergency shutdowns, extended outages, technical problems or weather related occurrences), the following guidance should be followed for the control of overtime:

- The scheduling of personnel for overtime will be limited if fatigue or lack of rest may impair operator performance.
- A person shall not be permitted to work more than 16 consecutive hours, excluding shift turnover time.
- A person shall not be permitted to work more than 24 cumulative hours in any 48 hour period, excluding shift turnover time.
- A person shall not be permitted to work more than 72 hours in a 7 day period, excluding shift turnover time.
- A person shall not be permitted to work more than 14 consecutive days without having 2 consecutive days off.
- Except during extended shutdown periods, brief pre- or post-shift training sessions, or weather-related occurrences, the use of overtime shall be considered on an individual basis and for the entire shift crew.

5.3.1 Approval for Deviation from Overtime Requirements

Any deviation from the overtime requirements shall be authorized on a case-by-case basis in advance by the Plant/Facility Manager or their designee in accordance with established procedures and with the documentation of the basis for granting the deviation. This may be done by making a signed entry in the operations logs. Individual overtime shall be reviewed monthly by the Plant/Facility Manager or their designee to assure that excessive hours have not been worked.

5.4 MONITORING OF OPERATING PERFORMANCE

As described in Chapter 6, "Investigation of Abnormal Events" operating problems shall be documented and evaluated. Based on assessments of these problems, corrective actions shall be taken to improve the performance of the organizations' performance. Additionally, frequent direct observation of operations activities by supervisors and managers is essential to performance of monitoring operations.

5.4.1 Event Reports and Major Audits

Each WGOCO is to establish an Events Coordinator. The function of the coordinator shall be to review in-house and industry events and forward them to Training and other groups.

Each WGOCO unit is to send a copy of their 10 day event reports and other documents such as audit findings to the other GOCO's units' Event Coordinator so that the coordinator may inform their site of happenings at other WGOCO sites and potential lessons from their experiences.

5.4.2 Plant Inspection Program

The purpose of the plant inspection program is to ensure that the plant industrial safety practices, radiological and hazard protection practices, material condition, and cleanliness and housekeeping meet management's standards. Through increased manager and supervisor involvement and direct personal observation, management will demonstrate interest in worker activities to a degree that will affect morale, motivation, and general work practice attitudes in a positive manner. The opportunity is created to provide positive feedback to individuals or groups whose efforts are recognized in the plant.

Tours of all operating areas should be made with the objective of improving operations. Discussions with operating staff concerning component and system performance, review of operator logs for follow-up action, and walkdown of event reports provides an incentive to personnel to improve operations. The

supervisor should know what to expect when an area is inspected. THE EXPECTATION IS EXCELLENCE, COMPLIANCE IS THE MINIMUM ACCEPTABLE. WGOO managers and supervisors are encouraged to invite their DOE counterparts on their tours of the facilities.

The plant program will include the following elements:

1. Each area of the plant will be inspected by a supervisor on a regular basis.
2. Information on the inspection observations will be collected and evaluated at a central location.
3. Corrective actions and responsibilities will be assigned for all deficiencies identified.
4. Feedback on the implementation of the program will be available to assess the overall effectiveness.
5. Results of the inspections will be tracked and trended. The results of that analysis will be made available to the appropriate personnel.

A sample plant inspection program is shown on Attachment A.

5.4.3 Self Assessments

Inspections, audits, reviews, investigations, and self-assessments are a part of the checks and balances needed in an operating program. Line managers and supervisors shall perform routine observations of personnel performing operating activities. Deficiencies identified shall be documented, analyzed, trended, and corrected. Also, other groups (i.e., quality assurance personnel) shall periodically review and assess operational performance. These reviews can assist line managers and supervisors in identifying and correcting problems. A self-assessment program shall be used by each facility to verify conformance with the requirements of this document and to achieve the expected performance and technical inquisitiveness. Facility Assessment Records (checklists) shall be completed to document the assessment results.

"Walking your spaces" is one way that a space and process ownership philosophy can be successful. To "walk your spaces" means keeping a critical eye on all activities. The objective is not only to make sure everything is running efficiently, but to constantly improve what one is responsible for while making safety a priority. This can also be achieved by practicing good housekeeping techniques, reporting deficiencies, and following up on the

corrective actions. Keys to an effective program are insisting that others respect ones area, doing the same for them, and leaving work areas in as good or better condition than when found.

5.4.4 Operations Self-Appraisal and Verification

Programmatic operations appraisals should be independently conducted and/or verified to ensure that environment, safety and health considerations, and operations functions (such as training) are being conducted in accordance with established operational criteria.

5.4.5 Operating Performance Goals

Safety, Environmental, Production, and Operating goals shall be established and used as management tools for involving cognizant groups or individuals in improving operating performance and measuring effectiveness.

Goals shall be auditable, measurable, realistic, and challenging. Meeting goals shall require a definite set of actions or an action plan. The action plan shall be developed with input from personnel involved in conducting operations and approved by management. Goals should be set and used as motivators for improvement, not as ends in themselves. The purpose is not simply to meet a numerical goal; rather, the purpose is to improve and monitor operating performance. The progress toward completing the action plan and achieving goals shall be monitored periodically. If results show a significant variance from the desired progress in achieving goals, management shall review the action plan to ensure that it is adequate and is being executed. A periodic assessment of performance relative to operating goals shall be provided to facility management. This summary shall include an explanation of performance and actions planned to improved future performance.

Goals shall be established in areas such as the following :

- Minimizing the total number and length of time equipment operating parameters are out of normal limits
- Minimizing the unavailability of safety systems
- Minimizing personnel errors
- Achieving As Low As Reasonably Achievable (ALARA) results
- Minimizing reduced facility capability
- Minimizing the number of unscheduled facility shutdowns
- Timely completion of scheduled surveillances

- Minimizing the amount of overtime
- Achieving and maintaining complete staffing and training of shift positions
- Minimizing waste volume
- Minimizing the number of activated (visual or audible) alarms
- Operating within environmental permit conditions
- Minimizing treated water consumption. This includes sanitary and cooling water and any water that requires chemical addition prior or during use.
- Minimizing lubricating and or fuel oil consumption.

5.4.6 Performance Indicators

Performance indicators for strategic parameters should be developed and given visibility appropriate to the mission of the facilities. The experience and lessons learned from using and developing performance indicators should be shared among the other GOCOs.

5.5 ACCOUNTABILITY

Workers and their supervisors shall be held accountable for operating performance. Personnel involved in significant or frequent violation of operating practices shall be counseled, retrained, and disciplined as appropriate. Supervisor performance appraisals and promotions shall include an assessment of operating performance and their successful handling of administrative, personnel, and technical issues.

5.6 MANAGEMENT TRAINING

Formalized supervisory and management training shall be incorporated into training programs. This is especially important to the first-line supervisors on shift and should aid them in managing shift activities. First line and first time Supervisors are to be given training to enhance "people" and administrative skills. DOE Order 5480.20 Personnel Selection, Qualification, Training, and Staffing Requirements at DOE Reactor and Non-Reactor Nuclear

Facilities provides appropriate guidance and should be used in a graded fashion. In addition, training for technical and operations supervisors should include the following subjects:

- **The Conduct of Operations** (using the contents of this manual)
Emphasis on Chapter 1, Organization and Administration
- **Job Specific Procedures and Expectations.**
Procedure changes, reviews controls, implementation
- **Casualty Control**
Emergency Response and Action Levels
Emergency Operating procedures
Fire protection/Suppression
First Aid/CPR
- **Operational Safety**
Criticality Safety or Site Specific Hazards Safety
Fitness for Duty
Basis for Operational Safety Requirements (OSRs) and Safety limits
Technical Specifications and Limits for Continued Operation (LCOs)
Safety Analysis Report (SAR) or Similar Document for the facility
Unreviewed Safety Questions
- **Administrative Requirements**
Functions and Organizations of site
Policy and Procedures
Role of the Supervisor
Labor agreement
Quality Assurance (line function) and Total Quality
DOE Orders
Federal and State Environmental Laws i.e., NPDES, CAA, CWA
RCRA, CERCLA, etc. (where appropriate)
OSHA
Critique Methodology, Root Cause and Event Reporting
Planning and Scheduling and Coordinating for Safety and Productivity
Work Control
- **Supervisory Management/Development**
Leadership
Interpersonal Relations Skills
Management Skills - Listening and Employee Concerns
Problem analysis and decision making
Westinghouse Corporate Courses

Training for nontechnical supervisors should cover the above subjects on a graded basis appropriate to their needs and duties.

Training should be documented using Qualification Standards. Written and oral examinations (boards) are to be used to help develop the supervisor and identify opportunities for reinforcement of the training received and the need for additional training. Oral boards should be convened by the training organization. The composition of the board shall be specified by training department procedures and shall include a senior organization manager to assure that the candidate has the proper safety, environmental and productivity philosophy. Minutes of the oral board shall be maintained. As a minimum, a summary of the questions and an evaluation of candidates answers should be recorded. At the discretion of the senior Westinghouse oral board member, a DOE representative may be invited as an observer.

Relentless training and improving is a characteristic of excellence. Each facility shall establish and budget for continuing training to maintain and enhance the proficiency of the operating personnel who perform functions associated with safety-related structures, systems and components identified in the SAR.

5.7 PLANNING FOR SAFETY

Facility guidance shall exist which describes safety preplanning requirements for all operational activities. The guidance shall explain the role of safety analysis reviews, job safety analyses, and the handling of safety matters. All personnel shall understand the safety planning requirements.

5.8 PLANNING FOR ENVIRONMENT

A WGO CO operating goal is zero discharge of pollutants to the environment.

Deliberate action will be taken to eliminate discharges to the environment of any toxic, hazardous, noxious, or offensive materials. Unnecessary water and oil consumption is wasteful and is an added burden on the environment. Each organization should identify the person(s) responsible for tracking and trending site water and oil use and discharges. The intent is to eliminate the needed processing of waste water. Leaking showers or rain water in leakage into areas or systems in which fluids have to be purified prior to release are examples of waste sources. It is important to minimize the generation of water which must be treated because the resulting waste stream (i.e., spent resin, backflush chemicals, and chlorine) adds to the cost and the environmental burden. Normal oil consumption baselines should be established. Oil use should be tracked to aid in elimination of discharges or spills to the environment. Examples of lube oil losses are oil leaks from mechanical drive steam turbines discharged via condensate drains to sewers, oil that is spilled from storage drums and tanks to the soil. Management

attention is required to minimize unnecessary consumption. All sites shall maintain a waste water and oil balance. It is not intended to duplicate permit requirements but supplement them.

Facility guidance shall exist which describes environmental preplanning requirements for all operational activities. The guidance should explain the role of permit compliance, permit modification and renewals, environmental consent decrees and agreements, and environmental mitigation action plan commitments.

5.9 FITNESS FOR DUTY

Personnel shall present themselves and maintain themselves in a condition fit for duty. Consumption of alcohol during work hours, including meal breaks, shall not be allowed.

No employee shall be permitted to assume their duties and responsibilities if it is obvious that the person is not alert, coherent, or capable of performing the requirements of the position.

Persons who observe behavior that indicates an individual is unfit for duty have the responsibility to confidentially advise a member of Management of such observations. Management shall evaluate the individual and make the final determination of the fitness of the individual to assume their responsibilities.

It is the ongoing responsibility of Management to evaluate the fitness for duty of personnel. The Manager's judgment in this regard is final. As quickly as safe operation permits, the Manager will document the circumstances leading to the removal of a person from the assigned activities and notify Upper Management.

It is a requirement that no person shall be required to work, if by so doing the individual feels the results of the work would jeopardize the safe operation of equipment, other personnel, or the general public.

6.0 REFERENCES

1. DOE Order 5480.19, Conduct of Operations Requirements for DOE Facilities.
2. DOE Order 5480.20, Personnel Selection, Qualification, Training, and Staffing Requirements at DOE Reactor and Non-Reactor Nuclear Facilities.

7.0 ATTACHMENTS

Attachment A Sample Plant Inspection Procedure
Attachment B Principles of Operations

ATTACHMENT A

SAMPLE PLANT INSPECTION PROCEDURE

1.0 PURPOSE

The purpose of this program is to provide a means to ensure deficiencies in industrial safety, material, environmental, radiation and radiological protection, cleanliness, housekeeping, and work in progress are identified and corrected to meet management standards.

The technical and administrative attributes of the facility operation are to be randomly sampled to assure the required standards are being met.

This program is both performance and compliance based.

2.0 SCOPE

The program includes:

- A. Material Condition
- B. Industrial Safety and Hygiene
- C. Housekeeping
- D. Radiation and Radiological Protection Practices
- E. Environmental
- F. Waste Reporting, Tracking and Closeouts
- G. In Progress Inspection, Maintenance, Modifications, and Operations

3.0 TERMS/DEFINITIONS

None

4.0 RESPONSIBILITIES

The Senior Facility Manager is responsible for the effectiveness of this program. Facility supervisors are responsible to understand, support, and continually develop management standards that surpass the industry average. A senior staff manager will administer the program by designating inspecting schedules, collecting inspection data, disseminating resolution item responsibilities, and ensuring that deficiency closeout status is up-to-date.

OPERATIONS ORGANIZATION AND
ADMINISTRATION (U)

All individuals listed on the Inspection Schedule are responsible to conduct inspections of their assigned area for the type of inspection indicated.

- A. Inspection areas are reassigned periodically to help ensure consistency throughout the plant.
- B. The inspection schedule should specify the week, inspection type and responsible supervisor.
- C. The inspection schedule will be issued to each supervisor quarterly.
- D. There are seven (7) types of inspections:
 - 1. Material Condition (M)
 - 2. Industrial Safety (S)
 - 3. Housekeeping (H)
 - 4. Radiation Protection (R)
 - 5. Waste Generation, Treatment, Storage (W)
 - 6. Environmental (E)
 - 7. In Process (IP) Inspection - this includes Conduct of Operations, Maintenance Modification, Construction, and Engineering.
- E. Each supervisor shall conduct an inspection of his assigned inspection area during the week scheduled.
- F. Each inspection should include a detailed walkdown of the area. Particular attention should be paid to out-of-the-way and limited-access areas. Improvements in specific areas should also be identified.
- G. Subordinates should be included on inspections periodically. This will provide a method to demonstrate inspection techniques and convey high standards.
- H. Deficiencies should be documented during the inspection to provide accurate description and location information.
- I. On-the-spot corrective action should be encouraged as appropriate.
- J. The inspection reports will be assembled and deficiency responsibilities will be assigned, tracked, and trended.
- K. All deficiency reports will be tracked and trended to establish causes, develop opportunities, and eliminate present and future problems in a safe, cost effective manner.

- L. Management Tours - In addition to the inspections conducted above, senior management should conduct random, unannounced observation tours on weekends and on backshifts. The tours can be unstructured but the results should be documented and provided to the President at the site. To facilitate awareness by senior managers of areas of activity beyond their responsibility, it is expected that every senior manager will be assigned, on a rotating basis, to conduct facility tours. A portion of the tours are to be conducted on backshifts and weekends. The tours are to be broad in scope and facility coverage.

6.0 REFERENCES

1. INPO Good Practice 87-023, Plant Inspection Program.
2. Associated INPO Good Practices 83-045, 84-030 (OP-206), 85-203 and 85-038.

7.0 ATTACHMENTS

Attachment (M)	Material Condition Deficiency Report
Attachment (H)	Housekeeping Deficiency Report
Attachment (S)	Industrial Safety Deficiency Report
Attachment (R)	Radiation Safety Deficiency Report
Attachment (W)	Waste Deficiency Report (Sample not provided)
Attachment (E)	Environmental Deficiency Report (Sample not provided)
Attachment (I)	In Process Inspection Deficiency Report (Sample not provided)

THE ATTACHED CHECK LISTS ARE NOT ALL INCLUSIVE. THEY HAVE BEEN ADDED TO THIS MANUAL TO PROVIDE A STARTING BASELINE

ATTACHMENT (M)

MATERIAL CONDITION DEFICIENCY REPORT CHECKLIST

1. Leaks - water, steam, oil, air, chemicals
Valve - packing, stem, seal, flange, body rust, corrosion
2. Lubrication - oil, grease, water (evidence of too little or too much as noted by sight glasses) flow indicators, grease cups or fittings.
3. Handwheels/Actuators - missing identification label, keys, pins, etc.
4. Filters, Screens/Louvers - clogged, dirty, broken, missing
5. Gauges/Instruments - not in calibration, inoperable, face broken, damaged pointer, burned out lamp, over-ranging
6. Drains - clogged, full, missing grating
7. Lines/Pipes/Fasteners - loose, missing, insulation damaged or stripped
8. Panels - covers missing, open, dirty, graffiti, latch hardware, labeling missing, dirty inside
9. General Area - burned out lighting, graffiti
10. Valve packing - bottomed-out adjustments, dirty corroded glands
11. Pump packing - bottomed-out adjustments, dirty corroded glands
12. Cables/Trays - frayed, unsecured, dirty, foreign objects, terminations improper
13. Motors/Pumps - dirty, grounding straps, excessive noise or vibration, cluttered area
14. Uncontrolled Operator Aids - make shift labeling, superfluous information, post-it notes, missing or poor tagging
15. Equipment grounds
16. Wiring - improperly terminated, bent, not laced, missing insulation

ATTACHMENT (H)

HOUSEKEEPING DEFICIENCY REPORT CHECKLIST

1. Cluttered areas, dirt accumulation, messy loose items, uncleaned horizontal surfaces
2. Undisposed of packaging material
3. Cigarette butts on floor, near doors, on the ground
4. Tools or parts left unattended for prolonged periods of time
5. Caked dirt on equipment and bed plates
6. Signs and labeling in poor condition
7. Storage area disorderly
8. Shop areas cluttered, old parts lying about
9. Floors not maintained, messy, unattractive corners
10. Restrooms/Shower - not properly cleaned, showers/faucets leaking
11. Cleanup of local areas of maintenance
12. Painting required
13. Chemical containers lying about, disorderly
14. Chemicals unlabeled and not specified in a work procedure
15. Hazardous chemicals or containers improperly labeled or stored
16. Chemical leaks or spills
17. Improper chemical use
18. Oil absorbent towels saturated with oil
19. Oil leaks/spills not promptly wiped up
20. Inspect panels for loose material, improper terminations
21. Other

ATTACHMENT (S)

INDUSTRIAL SAFETY DEFICIENCY REPORT CHECKLIST

1. Ladders - broken, unstable support, too steep, improper use
2. Catwalks - no safety rails installed, no toe-board
3. Scaffolding - improper guard rails, missing toe boards, being used without approved inspection tag attached
4. Compressed gas bottles - unsecured, caps missing, unlabeled
5. Tripping/Slipping Hazards - hoses, piping, holes, oil, water
6. Aisle ways - protrusions, clutter
7. Unsafe Work Habits
 - a. Failure to wear hard hats, safety glasses, proper shoes, ear protection
 - b. Working on energized equipment w/o proper approval or apparel
 - c. Handling chemicals w/o proper protection, no apron, face shield, gloves, ventilation
 - d. Improper lifting of heavy objects
 - e. Lack of fire watch for welding, grinding
 - f. Smoking in prohibited areas
 - g. Working without safety belts, lanyards
8. Fire Protection Equipment - hose racking poor, fire doors open, material in "KEEP AREA CLEAR" area
9. Area Controls - hazardous zones not posted, warning signs not available, accessible junk
10. Hearing Conservation - posted stay times inadequately labeled
11. Eyewash Stations - access restricted, inoperable
12. Fire Hazards - untreated wood, packing boxes, flammables unauthorized
13. Control of Confined Spaces
14. Lockout - Tagout

ATTACHMENT (R)

RADIATION SAFETY DEFICIENCY REPORT CHECKLIST

1. RWP - Not legible, not understandable, or not appropriate
2. Barriers - ropes, etc., not properly positioned or misleading
 - improper area posting or posting moved or taken down
 - area not posted
 - purpose of barrier not easily determined
3. Personnel Practices
 - a. Wearing or removing clothing improperly
 - b. Eating, drinking, or chewing in controlled area
 - c. Wearing dosimetry improperly
 - d. Handling rad materials w/o protective clothing
 - e. Frisking incorrectly (too fast, incomplete, not at all)
 - f. Throwing contaminated material, carelessness
 - g. General disregard for radiation safety
4. Protective clothing containers overflowing or outside of contaminated areas
5. Radiological protection equipment and instrument damaged or calibration overdue
6. Accumulation of radioactive materials, tools, small items in other than designated areas
7. Spills or leaks not redirected or contained
8. Inadequate RWP or job coverage by Rad Protection group
9. ALARA
 - personnel delay times not spent in low background areas
 - inadequate equipment or planning resulting in higher doses or contamination
 - general failure to follow good ALARA work practices
 - dose spent vs. dose allowed
10. Survey maps current, accurate, appropriate
11. Sample work knowledge of Rad safety practices
12. Inspection of Rad Con offices. Review source control
13. Conduct of Rad Con Ops., i.e. Procedures, Required Reading, Log Keeping
14. Waste minimization

ATTACHMENT B*

PRINCIPLES OF OPERATIONS

1. BELIEVE YOUR INDICATION unless it is confirmed to be in error.
2. DO NOT OPERATE WITH ALARM CONDITIONS, if necessary use extraordinary compensatory measures.
4. DO NOT OPERATE SO THAT LIMITS OR PROTECTIVE DEVICES ARE CHALLENGED.
5. Do not rely on check valves for leak isolation or as boundary valves. Check valves leak when you want them to be tight and are tight when you want them to leak.
6. Obtain double boundary isolation from high energy sources.
7. Check the position of valves that are supposed to be open by going in closed direction and those supposed to be closed by going in the closed direction. For closed valves THIS CHECK IS NOT POSITIVE because the valve could be stuck on its back seat.
8. Do not take the next step unless you can return safely.
9. DO NOT DEFEAT, BLOCK, OBSCURE, or MUFFLE AN ALARM LIGHT, HORN or WARNING DEVICE or alarm or warning system.
10. Do not operate with deficiencies that require the operator to intervene or otherwise compensate for deficiencies. DO NOT ACCEPT THE UNACCEPTABLE.
11. Leaks are an operators enemy, they cost money, generally get worse, and are not design features, so why operate with them.
12. DO NOT OVERRIDE OR BYPASS INTERLOCKS, LIMIT SWITCHES, or PROTECTIVE DEVICES OR SYSTEMS.
13. Extraordinary controls are needed when LEADS ARE LIFTED or when JUMPERS ARE INSTALLED; attention to their effects and REMOVAL is paramount.
14. Have spare empty tank volume when filling systems so the system can be drained.
15. Check alarms and indicating lights each shift.

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16. If there is no approved procedure or it has not been done before, get the procedure, walk it down, train on it, use mock ups.
17. Extraordinary controls are needed when relief valves are gagged, blocked, disabled, or undergoing testing.
18. Beware of temporary systems and modifications, they tend to become permanent and bypass the engineering rigor.
19. A temporary system that is used in lieu of the permanent system has to be every bit as good in function and protection as the permanent system. The same training, procedure, and operating discipline apply.
20. Know what to expect. If it does not happen or appear, STOP, and go to a steady state or shut down mode.
21. If an automatic safety feature fails, SHUTDOWN NOW; if an automatic operating aid fails, shutdown unless manual modes of operation are prescribed by procedures.
22. Where inspection is required, the inspector can not be the doer.
23. Beware of the results of independent verification if the verifications are done at the same time.
24. The person who signs must know what he is signing for.
25. Beware of the "all.....are.....", What is all?, How many is all?
26. Surveillance tests of all safety, alarm, limit or warning features of an operating system must be *conducted*. Failure of a test may be a Limiting Condition for Operation (LCO) situation.
27. What gets measured gets done.
28. Follow the procedure; build it like the drawing.
29. What is delivered is what is inspected, not what is expected.
30. A solid test program is fundamental to a solid operational system. Test after maintenance, then operational check it before it is put into service.
31. Fix everything that is broken, if not broken, maintain it.
32. If two or more indicators monitoring the same parameter do not agree, believe the worst case.

**WESTINGHOUSE CONDUCT OF
OPERATIONS MANUAL**

**Manual
Chapter
Page
Effective Date**

**WHC-SP-0708
1, Rev 1
23 of 24
January 1, 1994**

**OPERATIONS ORGANIZATION AND
ADMINISTRATION (U)**

- 33. Contamination, Stop it at its source!
- 34. When draining a volume, system, component, set up to collect or dispose of the fluid, depressurize, vent, drain, confirm. Protect the environment and the component. Use containments and filtered vents. Tag vent and drains, someone could change their position.

WESTINGHOUSE CONDUCT OF
OPERATIONS MANUAL

OPERATIONS ORGANIZATION AND
ADMINISTRATION (U)

Manual
Chapter
Page
Effective Date

WHC-SP-0708
1, Rev 1
24 of 24
January 1, 1994

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**SHIFT ROUTINES AND OPERATING
PRACTICES (U)**

1.0 PURPOSE

This chapter provides standards for the professional conduct of operations personnel which should be established and followed so that operator performance meets the expectations of DOE and facility management. The guidelines of this chapter describe watchstanding practices that apply to all operating personnel. This chapter describes some important aspects of routine shift activities and watchstanding practices.

2.0 SCOPE

Professional conduct and good watchstanding practices result in appropriate attention to facility conditions. Effective equipment monitoring is necessary to detect abnormal conditions or adverse trends so that appropriate action can be taken before equipment malfunction occurs. Notifying supervisors promptly of unusual or unexpected situations helps to ensure that proper attention is given to changing and/or off-normal conditions. Equipment status and the authority to operate equipment shall be understood by all operations personnel to ensure activities can be controlled and coordinated. Operations personnel shall follow proper industrial safety, radiological protection (if applicable) and quality assurance practices. These items are key elements that shall be included in an effective operator watchstanding program. A desire to conduct assigned tasks expeditiously shall not interfere with good watchstanding practices.

3.0 DEFINITIONS

"AT-THE-CONTROLS" - The specific floor space where a control operator(s) is stationed and in which other personnel in that area can block the operator's view of instruments, controls, indications, or otherwise restrict or distract from their attention.

CONTROL AREA - An area or room having an assemblage of control devices (i.e., switches, dials, breakers, valves) and indicating/monitoring equipment (i.e., meters, gauges, recorders, digital and analog readouts) which are used for the control of a process or system and interruption or improper operation of that process or system could jeopardize personnel safety, hazard the environment or result in significant financial loss.

OPERATOR - Broadly defined as anyone authorized to operate equipment. In addition to operations department personnel, this definition could include chemistry personnel, radwaste technicians, and other facility personnel.

SHIFT SUPERVISOR - The senior individual designated by position description as responsible for all aspects of operation of the facility assigned and to whom all on-shift operations personnel report during the

assigned shift. The Shift Supervisor responsibilities are transferred only through formal turnover to a qualified relief. This responsibility includes all aspects of shift evolutions as related to facility operation including production, personnel and equipment safety, both nuclear and industrial environmental protection, maintenance, quality assurance, radiation and contamination control, and employee training.

SHIFT OPERATING PRACTICES - Actions and checks required as a minimum of operators as they conduct their routine duties:

ROUND SHEET - A written record of operating parameters for equipment and areas located within the responsibility of a particular operator position. Round sheets contain information such as time of observation, maximum and minimum acceptable operating parameters and normal operating ranges. Round sheets also should contain a narrative section for describing causes for abnormal conditions, for noting actions taken to correct abnormal conditions and for indicating that supervisors have been notified of abnormal conditions. As an alternative to the narrative section on round sheets, narrative records may be maintained in bound or loose leaf binders.

NORMAL OPERATING RANGE - Those operating parameter values expected during normal equipment operation.

MAXIMUM AND MINIMUM VALUES - The highest and lowest parameter values that are either provided by the equipment supplier or determined by actual testing or experience.

4.0 RESPONSIBILITIES

It is the responsibility of the on-shift operating crew to safely operate the DOE facility through adherence to operating procedures and technical specification or operational safety requirements and sound operating practices. The authority for operations should be through formal turnover to a qualified relief.

4.1 SHIFT SUPERVISOR

The Shift Supervisor shall maintain authority and responsibility for all facility operations, which shall be transferred only through formal turnover to a qualified relief. If a special test, evolution, or abnormal condition arises, facility personnel should be aware that the responsibility and authority to determine corresponding operating conditions, system alignments, or equipment manipulations rests fully with the Shift Supervisor. The Shift Supervisor shall not permit any individual to bypass or overrule their operational judgment without bringing the matter to the attention of higher line authority.

SHIFT ROUTINES AND OPERATING
PRACTICES (U).

Shift Supervisors are responsible for good conduct and discipline on their shift. This includes evaluation of personnel fitness for duty and any actions required to assure the safety of personnel and equipment under their cognizance.

4.2 ALL PERSONNEL

Personnel are responsible and accountable for all operations conducted on their shift including the status of all systems, components, and records within their defined work area. Personnel are responsible for conducting operations through adherence to operating procedures, Technical Specifications and Operational Safety Requirements in such a way as to maintain safe conditions within the boundaries of the work locations, and in such a way as to complement overall facility operation.

Personnel shall not attempt any operational activity they do not feel qualified to perform.

Personnel are responsible to think ahead during the conduct of an evolution, to anticipate the results of the next actions and, if appropriate, stop and resolve concerns prior to proceeding.

Personnel shall show ownership of facility areas. This ownership includes not only maintaining systems and equipment operating within specified limits, but also maintenance of the material condition of the spaces for which the operator is responsible. This includes wiping up fluid leaks, initiating corrective action for deficient equipment, and other like activities.

Personnel are expected to report to work alert and prepared to carry out the full range of expected duties. If due to sudden illness or some other reason, a person becomes unable to perform the assigned duties, they are expected to request a relief.

5.0 PROCEDURE

5.1 STATUS PRACTICES

The operator responsible for equipment shall be promptly notified of all changes in status, abnormalities, or difficulties encountered in performing assigned tasks. Similarly, all personnel shall notify the Shift Supervisor of any unexpected situations.

5.2 SAFETY PRACTICES

Personnel shall adhere to the requirements of the industrial safety program. Proper hearing, vision, head, foot, and respiratory protection shall be worn

SHIFT ROUTINES AND OPERATING
PRACTICES (U)

in designated areas to reduce the potential for injury. Similarly, ladders or other approved means shall be used to access equipment located overhead when permanent steps or catwalks are not available to minimize the potential for accidents. Personnel shall not routinely climb or walk on facility components and insulation because this could result in personnel injury or damage to equipment. Personnel shall exercise appropriate precautions when entering or working in or around energized panels or equipment. For example, operators should ensure that electrical panel closures are securely fastened prior to making the breakers operable to energize equipment. This reduces the potential for personnel injury if a fault causes breaker arcing during operation.

All personnel shall:

- Comply with all prescribed safety precautions and regulations. Any operation that is in violation of a safety rule shall be stopped and reported immediately to management.
- Ensure safety chains and guards are properly positioned when touring the facility and work areas.
- Ensure all doors are properly closed. Doors serve as fire containment, air locks, contamination control, and security barriers. Normally, doors shall not be propped open for the passage of electrical leads, hoses, or for any other reason. Action shall be taken to clear and close any door found propped open. Problems with the closing of fire containment or security doors shall be reported to the shift supervisor or security personnel.
- Look for and correct hazardous conditions.

5.3 OPERATOR INSPECTION TOURS

Operator tours shall be of sufficient detail to ensure that the status of equipment is known. Operators shall conduct a thorough tour of all areas within their responsibility and make appropriate equipment inspections at designated times and at least once per shift. The Facility Manager may designate specific rooms to be inspected less frequently because of adverse radiological or equivalent personnel safety conditions, or more frequently if problems have been encountered. In these cases, the Facility Manager shall specify an alternate inspection schedule. Site security concerns shall not override operator safety assessment duties. A tour normally shall be made early in the shift to gain familiarity with the condition and status of equipment for which the operator is responsible.

During tours, equipment shall be inspected to ensure that it is operating properly or, in the case of standby equipment, that it is fully operable. In addition, the following activities shall be conducted in conjunction with the tour:

- The status of equipment (i.e., operating, standby, work in progress, or out-of-service) shall be determined so that the operator will be best able to respond to problems encountered during the shift.
- Components, such as electrical panels, ground detectors, alarm panels, auto-start standby equipment, and breakers shall be inspected for abnormal or unusual conditions. Unexpected conditions such as equipment vibration, unusual noises or smells, or excessive temperatures shall be reported to the Shift Supervisor so that repairs, troubleshooting, or additional operator action may be directed as necessary.
- Equipment panel alarm light bulbs and annunciators shall be periodically checked at least once per shift to ensure satisfactory operation of visual and audible abnormal condition indicators.
- Operators shall inspect all areas for which they are responsible and note any deficiencies that may be present. These deficiencies may include steam, oil, or water leaks; fire and safety hazards or radiological problems; seismic concerns such as open electrical panels and mobile objects; clogged floor drains; housekeeping or cleanliness problems; and building deficiencies such as inoperative lighting, roof leaks, or doors that do not close properly.

Operators shall take appropriate action to correct or report deficiencies noted during tours. Equipment deficiencies shall also be documented in accordance with the facility maintenance work request system.

If too many concurrent activities will prevent completion of assigned tasks, request direction from Shift Management. Any decision not to pursue an assignment must be reviewed with the appropriate supervisor.

5.4 ROUND SHEETS

Round sheets, data sheets, or reading sheets are an effective method for providing operators with guidance on the extent to which equipment and areas should be inspected during routine tours. The recording of key equipment parameters during tours provides a record of equipment performance and can be used to reconstruct events leading up to unusual occurrences or system malfunctions. This record permits short-term trending by operators so that undesirable trends and equipment problems can be identified and corrected. Round sheets also facilitate operator turnover of equipment status and are an effective aid in the training and qualification of new operators.

SHIFT ROUTINES AND OPERATING
PRACTICES (U)

Round sheets shall be developed and approved by the Facility Manager. They shall include parameters for equipment located within the particular shift position. Where appropriate, equipment parameters on round sheets shall include maximum/minimum values or expected operating ranges to enable operators to recognize abnormal readings quickly. Limits derived from Technical Specifications or Operational Safety Requirements shall be highlighted. Equipment should be listed on round sheets in the same order that it would be encountered during a normal tour of the operating station. The round sheet should include a narrative section.

Operators shall use the narrative section to document major evolutions, causes of abnormal conditions, and actions taken to correct abnormal conditions. A narrative log book may be substituted for the narrative section on the round sheet. Data shall be recorded on round sheets at the times specified. When round sheet data is not obtained within one hour of the specified time, the actual time the data was obtained should be noted on the round sheet, Shift Supervisor shall be notified, and the reason noted on the round sheet. As soon as possible, the reading will be taken and evaluated for potential out-of-limit conditions that may have occurred during the period missed.

Parameters exceeding the specified maximum or minimum values shall be circled or otherwise highlighted on the round sheet and promptly reported to the control area or cognizant supervisor. The causes of abnormal indications shall be promptly investigated with supervisors becoming involved as appropriate. Disposition of all circled parameters shall be explained in the narrative section. Round sheets shall be reviewed by the cognizant supervisor each shift to identify trends or abnormal readings, and to verify that data has been properly recorded.

Operator tours shall be periodically monitored by supervisory personnel to ensure that comprehensive tours continue to be conducted, including, as necessary periodic inspections of equipment and areas not listed on the round sheets.

5.5 PERSONNEL PROTECTION, AND AS LOW AS REASONABLY ACHIEVABLE (ALARA)

Personnel shall be appropriately qualified to follow good personnel protection practices to maintain personnel exposure ALARA, (as defined in DOE 5480.11, ALARA Program) to radiation, chemicals, electromagnetic fields, toxic materials, and other personnel hazards. In particular, personnel shall observe the following requirements:

- Adhere to all posted personnel protection requirements and observe proper practices and precautions while in controlled areas.
- Correctly utilize appropriate monitoring instruments when required.

- Be cognizant of their own exposure levels and take appropriate action to minimize exposures.
- Be knowledgeable of the proper use of radiation work permits, safe work permits, or inhalation limits, where applicable.
- Promptly report protection deficiencies and hazards to supervision and/or appropriate protection personnel (personnel shall take appropriate immediate actions to reduce or correct the hazards).
- Inform appropriate protection personnel before evolutions or activities are performed that have a potential to significantly change conditions in the facility.

Supervisory personnel shall periodically review exposure trends of personnel under their supervision. Emphasis should be placed on determining the adverse factors that contribute to personnel exposures and minimizing those factors to keep exposures as low as reasonably achievable.

5.6 RESPONSE TO INDICATIONS

Operators shall believe instrument readings and treat them as accurate unless proven otherwise. Ignoring an unusual reading because the operator believes an instrument is faulty can cause abnormal conditions to be undetected. Operators shall check other indications, if possible, when unexpected readings are observed. Prompt action shall be taken to investigate the cause of abnormal or unexpected indications so that prompt corrective action can occur. When malfunctioning or inaccurate instruments are discovered, the instruments shall be appropriately identified to prevent subsequent confusion. Instrument and control personnel should be notified to effect repairs. In situations of operator doubt, operators shall be instructed to achieve facility, personnel, and environmental safety above facility production.

5.7 RESETTING PROTECTIVE DEVICES

When protective devices (such as circuit breakers or fuses) trip, an attempt shall be made to understand the cause of the trip before it is reset. Normally, before action is taken, an operator shall ensure that no abnormal condition exists that would preclude resetting. However, because the consequences of inappropriately resetting protective devices vary considerably, good judgment and specific guidance are necessary in this area. Operations management shall provide appropriate guidance so that tripped protective devices are properly addressed. Facility trips and unplanned forced shutdowns require a thorough investigation in accordance with the guidance of Chapter 6.

5.8 KEY CONTROL

To facilitate control over keys that are used in the day to day operations, there shall be a key accountability log in place to record what keys are being used by which individuals. The key storage cabinet shall contain an inventory list to expedite location of keys. Key accountability shall be maintained by a review during Shift Turnover (Chapter 12) or, as a minimum, conducting a weekly inventory.

5.9 PROCESS RATE OR LOAD CHANGES

The Shift Supervisor, Control Area Operator, or Cognizant Manager for a test and research facility shall approve all power or process rate changes because these persons are held accountable for safe operation. Additionally, they will probably be the persons most knowledgeable of problems that occur as a result of these changes. However, the operator may decrease load or rate without approval, if necessary, to respond to a facility emergency situation in accordance with the facility's emergency procedures.

5.10 AUTHORITY TO OPERATE EQUIPMENT

The overall operation of the facility shall be governed by approved procedures and shall be directed by the Shift Supervisor for a large DOE facility and by the Facility Manager for a test and research facility.

Operations management shall ensure that only trained and qualified personnel operate equipment. In general, the operator and the operator's supervisor shall be aware of all activities affecting equipment. The operations supervisor should specify those general activities that may normally be performed without informing the supervisor and should amplify these specifications as appropriate. Examples of such activities are pumping certain sumps (plant equipment operators) and the routine minor adjusting of controls necessary for maintaining stable process conditions. However, nonroutine operation of controls should not be made without specific approval of the Shift Supervisor. During emergencies, operators shall take necessary immediate actions required to ensure personnel, facility, and environmental safety without obtaining prior approval; however, the appropriate manager or supervisor shall be promptly informed of these actions. Operators shall be instructed that safety should be achieved over facility production for off normal and emergency facility conditions.

Personnel safety, facility casualties/emergencies, Operational Safety Requirements (OSR), Technical Specifications compliance, are of prime importance and will take precedence over all other activities.

5.11 SHIFT OPERATING BASES

The operating base is the facility area to which an operator returns when not performing other assigned duties. An operating base shall be established for each shift position. The operating base shall be located at a convenient place within the area of responsibility for that shift position. Each operating base shall be equipped with appropriate office equipment for the operator to maintain necessary procedures and references to conduct administrative duties. Also necessary communication equipment shall be available at the operating base. Shift turnovers shall be conducted within those facility areas assigned to the operations department and typically at the operating base.

5.12 POTENTIALLY DISTRACTIVE WRITTEN MATERIAL AND DEVICES

Written material unrelated to operations and entertainment devices (such as radios, televisions, tape players, and computer games) shall be prohibited from use by on-duty personnel in order to minimize distractions from their responsibilities. Written material and entertainment devices shall not be brought to work stations. However, operators may read training bulletins, technical manuals, operating experience information or review other written, audible, or visual materials that relate to operator duties. Judgment shall be used to ensure the operator's primary duties are not compromised. The Shift Supervisor (or equivalent) should provide guidance to the shift crews for the use of potentially distractive materials and devices.

5.13 PROCEDURE COMPLIANCE

All operations shall be performed in strict compliance with approved procedures. If during an emergency there are no procedures covering the situation, operators shall take the actions necessary to place the facility in a safe condition and to protect the public, plant personnel, the environment, and facility equipment. Subsequent to such an event, an evaluation shall be made as part of the abnormal event investigation to ascertain the need for a procedure.

5.14 OPERATOR DRESS STANDARDS AND GROOMING

The perception of our performance by our customers, regulators, suppliers, and vendors is strongly influenced by our appearance. Therefore, it is inappropriate to wear articles of clothing such as shorts, cutoffs, tank tops, open-toed shoes, and other attire not appropriate for the facility. Personnel shall complement professional behavior by example by reporting for work with personal appearance and clothing appropriate for their position. Maintenance of a neat, uniform, and well groomed appearance is a fundamental element of a professional atmosphere. It contributes to pride and esprit de corps and is

an essential part of the image that we wish to convey to both the facility and the public. Personnel who operate the facility system and equipment generally set the standards that others follow. To maintain a professional appearance, clothing worn while at work (including hard hats) shall not include slogans, symbols, or diagrams not related to company or facility activities.

Clothing worn by operations personnel should neither be so tight as to be restrictive, nor so loose as to be caught in moving machinery. Protective clothing shall be worn in all zones designated for such attire. Safety equipment such as safety shoes, hard hats, ear plugs, or safety glasses must be worn where required. Substantial footwear resistant to puncture and liquid penetration is recommended.

Hair should be well groomed and not present an unkept appearance. Bulk and length of hair shall be such that it cannot interfere with vision or become a hazard to the wearer in emergency situations. It shall not interfere with the proper fit of headgear, respiratory equipment, and similar other emergency equipment.

5.15 FITNESS/ALERTNESS/ATTENTION TO DUTY

Operations personnel shall adhere to the Fitness for Duty requirement of Chapter 1. In addition, personnel have the individual responsibility to be alert throughout their shift assignment. In addition to maintaining alertness, personnel shall be attentive to the work and tasks they perform to assure that they are accomplished completely and accurately.

Activities within the Control Area should be performed with formality. Activities outside the control room with the potential to affect operations, such as on-line maintenance and surveillance, should be fully coordinated with the control area. Communications with or notification of the operator At-the-Controls should be established and maintained throughout each activity.

Potentially distracting activities such as non-work related reading, radio listening, game playing, and horseplay are prohibited. Non-job related discussions should not detract from operations personnel professional responsibilities. Computers shall only be used for company work activities.

The rules of common courtesy shall be observed at all times. Courtesy shall be extended to fellow workers, and to persons from other work groups. When difficulties are encountered in interfacing with others, it is expected that the individual involved will attempt resolution in a courteous, professional manner and that if the difficulty persists, the personnel involved will request assistance from management. Courtesy is essential to maintain professional decorum.

Personnel in more senior positions have a responsibility to set a proper example for more junior operations personnel by continuously demonstrating a

SHIFT ROUTINES AND OPERATING
PRACTICES (U)

responsible, professional attitude toward work assignments. More senior, experienced personnel are expected to provide assistance, guidance, and direction to personnel in less senior, experienced positions.

The following requirements are applicable to Operations Personnel:

- Operators shall be alert and attentive to alarms and if appropriate, shall take timely action to address and correct the cause of alarms. It is expected that operators will maintain parameters within normal ranges so that the number of actuated alarms is minimized.
- Operators shall monitor console and panel displays frequently to determine trends and to detect the development of problems.
- Operators shall take prompt actions to determine the cause of the abnormalities, advise Shift Management of the abnormalities and take corrective action.
- Operators shall not undertake more concurrent evolutions than they can safely and effectively control. An excessive number of such concurrent evolutions can compromise the operator's ability to detect and respond to abnormal conditions. It is the operator's responsibility to report to shift management, any situation where the number of concurrent evolutions or work activities could detract from the operator's ability to properly control or monitor his assigned plant systems and equipment.
- Operators must be continuously alert to facility conditions and ongoing activities affecting facility operations, including conditions external to the facility such as meteorological conditions, and changes in support equipment status. Operators should anticipate operational occurrences, promptly respond to off-normal conditions, and correct problems affecting operational conditions in a timely manner.

Good operating practice requires frequent monitoring and checking of facility systems. Such monitoring shall include status in the control area and general operating conditions in the operating areas of the facility.

A primary activity of shift operations personnel is the observation and monitoring of the operating status and condition of equipment, controls, and displays. These observations obtain the following types of information:

- Configuration of the equipment or system, e.g., valve position, switch position, vibration, instruments isolated or valved into service, including that of blocked equipment.
- Condition of equipment or system, e.g., clean, dirty, blocked by material or trash, vibrating, overheated, etc.

- Status of equipment; e.g., shutdown, operating, isolated, in standby, etc.
- Status of alarms or other warning indicators such as barriers or signs.
- Process parameters with respect to expected or normal values.

Shift operating personnel are encouraged to develop and publish a statement of professionalism. It is not sufficient for operating personnel to solely rely on requirements established by managers, DOE, or other entities. A commitment to professionalism in the way we do our business will result in greater safety, reliability, and performance. Management will support development of the statement of professionalism to the extent requested by the operating personnel.

5.16 MAINTENANCE OF RECORDS

Records must be legible, accurate, complete, understandable, and recorded in permanent black ink.

Errors shall be corrected by drawing a single line through the incorrect information and entering the correct information adjacent to it, or on the space available with reference to the deleted information. The individual making the correction will place his initials and the date the correction is made next to the corrected entry.

The individual responsible for maintaining logs and data sheets is responsible for signing and dating the portions of the records covering their shift assignments. All blanks must be filled in with the required information or marked not applicable (NA).

Recorder charts shall be marked with the date, time, recorder identification number, and operator initials upon installation of a new chart and removal of a completed chart. The recorder should be inspected for proper operation on a daily basis with date, time, and operator's initials annotated on the chart. When significant events or unusual trends in parameters occur, the resulting recorder traces shall be marked, as to the time and event to assist in operation analysis.

Whenever significant problems requiring corrective action by the operator are encountered, the problems will be logged. When problems are solved, the resolution should also be logged. A status entry on problems is required. Follow-up entries are required that the problem has been investigated and resolved.

**WESTINGHOUSE CONDUCT OF
OPERATIONS MANUAL**

**Manual
Chapter
Page
Effective Date**

**WHC-SP-0708
2, Rev 1
13 of 14
January 1, 1994**

**SHIFT ROUTINES AND OPERATING
PRACTICES (U)**

5.17 HOUSEKEEPING

The responsibility for good housekeeping rests with each and every member of the operations staff. A job shall not be considered complete until the housekeeping is completed. Any situations involving disregard for housekeeping policies shall be promptly reported to the Shift Supervisor.

6.0 REFERENCES

1. DOE Order 5480.19, Conduct of Operations Requirements for DOE Facilities.
2. DOE Order 5480.11, ALARA Program

7.0 ATTACHMENTS

None

**WESTINGHOUSE CONDUCT OF
OPERATIONS MANUAL**

**SHIFT ROUTINES AND OPERATING
PRACTICES (U)**

**Manual
Chapter
Page
Effective Date**

**WHC-SP-0708
2, Rev 1
14 of 14
January 1, 1994**

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1.0 PURPOSE

The purpose of this chapter is to define the policy for Control Area Activities. Control area activities should be conducted in a manner that achieves safe and reliable facility operations. This chapter addresses the important elements of control area activities that are necessary to support safe and efficient facility operation.

2.0 SCOPE

Control areas are the most critical facility operating bases and the coordination point for important facility activities. Therefore, activities in the control area must be businesslike, and a professional atmosphere conducive to safe and efficient operation must be maintained. In addition, control area operators shall not be overburdened with administrative responsibilities, and control area access shall be limited so that operators will not be distracted from properly monitoring facility parameters.

3.0 DEFINITIONS

CONTROL AREA - An area or room having an assemblage of control devices (i.e., switches, dials, breakers, valves) and indicating/monitoring equipment (i.e., meters, gauges, recorders, digital and analog readouts) which are used for the control of a process or system and interruption or misoperation of that process or system could jeopardize personnel safety, hazard the environment, or result in significant financial loss.

"AT-THE-CONTROLS" - The specific floor space where a control operator(s) is stationed and in which other personnel in that area can block the operator's view of instruments, controls, indications, or otherwise restrict or distract from their attention.

4.0 RESPONSIBILITIES

4.1 Facility Manager

The Facility Manager is responsible for identifying control areas and those areas considered "at-the-controls" and for the establishment and maintenance of high standards for control area conduct.

4.2 Shift Supervisor and Control Area Operators

The Shift Supervisor and Control Area Operators have the responsibility and authority to uphold the standards of conduct defined in this manual. They shall restrict access or remove personnel from Control Areas for which they

are responsible during routine and/or emergency operations as required, to meet this responsibility.

5.0 PROCEDURE

5.1 Control Area Access

Control area access shall be limited to those persons on official business only. Entry shall be controlled by the Shift Supervisor or designee. The "at-the-controls" area shall be clearly identified, and its boundary shall be understood by all persons who are granted access to the control area. Access to the "at-the-controls" area shall be restricted to personnel who need to be in the area and entry into this area shall be granted by the control area operator and persons who might need to enter this area should know who can grant access.

5.2 PROFESSIONAL BEHAVIOR

Professional behavior shall be displayed in the control area at all times. Only activities essential to supporting operation and activities authorized by management shall be conducted in the control area. Potentially distracting activities (such as radio listening, game playing, non-job related literature reading, and horseplay) shall be prohibited. Non-job related discussions shall be minimized so as not to interfere with conduct of the shift or monitoring of key parameters.

Personal phone calls shall not be permitted except in an emergency. The control area is not to be used as an eating place for operators and other personnel. Control area personnel may eat in the control area out of necessity. Other control personnel shall not use the control area as their eating area. They should use properly designated eating areas. At no time should liquids be consumed in an at-the-controls area unless specifically authorized for unique conditions by facility policy.

All control areas activities shall be conducted in a disciplined, formal, business-like, and professional manner. The noise level in the control area will be kept at a minimum. Formality and professionalism in the conduct of shift operations shall be required. (Leaning on the bench board or control panels and/or having ones back to the control board being monitored is not considered professional).

5.3 Monitoring the Main Control Panels

Operators shall be alert and attentive to control panel indications and alarms. Control panel indications shall be monitored frequently, and prompt action taken to determine the cause of and correct abnormalities. Emphasis shall be placed on closely monitoring and trending to detect problem situations early. Operator response to alarms shall be timely, and actions shall be taken to address and correct the alarm causes. All reasonable actions shall be taken to clear alarming conditions. Alarms and annunciators shall not be disabled. The number of evolutions affecting control panel indications that are performed concurrently shall be limited so that the operator's ability to detect and respond to abnormal conditions will not be compromised. If computer or automated systems are in place, there shall be an appropriate backup to those systems.

5.4 Control Area Operator Ancillary Duties

Duties assigned to operators shall not interfere with their ability to monitor facility parameters. Activities such as preparation of tagging, reviews of operating procedures, Required Reading, and review of maintenance work activities shall not interfere with the operator's primary responsibilities. The administrative workload of operators responsible for monitoring and operating the control board shall be minimized. If one operator is involved in administrative tasks, other operators should assume responsibility to monitor the unit. Some administrative activities are better performed away from the "at-the-controls" area by an operator who is not responsible for operating the main control panel.

5.5 Operation of Control Area Equipment

Only persons specifically authorized by administrative procedures shall operate control area equipment. When trainees operate this equipment, trainees shall be supervised and controlled by the operator, who is on-shift instructor qualified, and who normally would perform the operations. If the operator is not on-shift instructor qualified, then the trainee shall be supervised and controlled by an operator that is qualified.

6.0 REFERENCES

1. DOE Order 5480.19, Conduct of Operation Requirements for DOE Facilities.

7.0 ATTACHMENTS

Attachment A Sample Control Area Access Sketch

ATTACHMENT A

SAMPLE CONTROL AREA ACCESS SKETCH

"At-the-Controls Areas."
Access restricted
without proper
authorization

Limited Access Area
Obtain permission
prior to entry

Entry Point
Obtain permission
prior to proceeding
beyond this point

1.0 PURPOSE

The purpose of this chapter is to establish a methodology for highly effective, reliable, and accurate transmission of information within the facility through verbal and audible means.

2.0 SCOPE

Since accurate communications are essential for the safe and efficient operation of facilities, guidance in the use of the various forms of audible and verbal communication is necessary. These communications must be controlled to ensure that they do not detract from normal operations and are available in an emergency.

Audible communications are used to transmit operating, administrative, and emergency information within the facility. Face-to-face, telephone, radio, public address announcements, sound-powered phones, and special sounds (horns and bells) are examples of audible communications. This includes repeating back instructions to ensure the accurate transmission and receipt of verbal instruction. Standardized terminology and the use of a phonetic alphabet (Attachment A) are other means of ensuring that verbal communication are understood.

Many facilities use horns, sirens, bells, and the public address system to alert personnel to abnormal or emergency conditions. These communication must be controlled to ensure that they do not detract from normal operations and are available in an emergency.

3.0 DEFINITIONS

None

4.0 RESPONSIBILITIES

4.1 FACILITY PERSONNEL

Facility personnel are responsible for the following:

- Verbal communications involved in facility operations shall be conducted in accordance with this procedure.
- Reporting defective communication equipment in accordance with the facility work control system program.

4.2 FACILITY/OPERATIONS MANAGER

The Facility Manager is responsible for the following:

- Ensuring the requirements and instructions of the facility communications program are implemented.
- Ensuring that all communications are conducted in a professional manner.
- Conducting a periodic survey of facility areas to ensure all facility personnel can be alerted to emergency situations when working in high-noise areas. This survey shall also ensure that all on-duty shift personnel can be quickly contacted.

5.0 PROCEDURE

5.1 EMERGENCY COMMUNICATIONS SYSTEMS

Methods shall be implemented to ensure all facility personnel are promptly alerted to facility emergencies. When personnel are working in areas where the public address system or emergency signals cannot be heard, alternate methods for alerting these persons shall be utilized. Flashing lights, personal pagers that vibrate and can be felt, and persons dedicated to notifications are examples of alternate methods that might be effective.

Emergency communications systems shall be periodically tested to ensure that they are functional. Control areas shall have the capability of overriding other users of the public address system for emergency announcements.

5.2 PUBLIC ADDRESS SYSTEM

The use of the facility public address system shall be administratively controlled to ensure it retains its effectiveness in contacting facility personnel. Excessive use of the public address system for paging of personnel and unnecessary announcements shall be avoided because excessive use can reduce the impact of important announcements and can be distracting. Facility telephones and other point-to-point communications channels shall be used in lieu of the public address system whenever practical. Consideration shall be given to dedicating certain paging system channels to specific groups or functions, (e.g., a dedicated channel for routine operations or a dedicated channel used only for emergencies).

5.3 CONTACTING PERSONNEL

A method shall be implemented to ensure that control areas can quickly contact all personnel. To avoid operator confusion, a distinction shall be made between a routine and emergency notification. Examples cited above in 5.1, Emergency Communication Systems, for communication in high-noise areas may be effective in accomplishing this function.

5.4 RADIOS

Portable radios can be an effective means of providing mobile point-to-point communications and may be used for this purpose. Radio usage shall not be allowed in areas where electronic interference with facility equipment may result. Areas where radio usage is prohibited shall be posted. Instructions regarding frequencies (channels) and postings should be provided. Consideration should be given to dedicating certain radio channels to specific groups or functions (e.g., a dedicated channel for security or a dedicated channel employed integrated surveillance tests). There should be an area log kept to keep track of area radios. It should include radio identification numbers, maintenance dates, etc.

5.5 ABBREVIATIONS AND ACRONYMS

The use of abbreviations and acronyms shall be minimized. Only abbreviations and acronyms from an approved list shall be used in facility communications. Both written and spoken terms shall be described in the list. For example, residual heat removal service water might be written "RHRSW" and spoken "RHR service water."

5.6 ORAL INSTRUCTION

Oral instructions shall be clear and concise. In all communications, the sender and intended receiver shall be readily identifiable. Instructions involving the operation of equipment shall be repeated by the receiver to the extent necessary for the sender to ensure that the instructions are correctly understood.

5.6.1 Operating Directions

Operating directions are verbally assigned actions involving the operation of a component or system. Verbal directions are normally limited to short, straight forward directions. Matters not meeting this criterion should be presented and acknowledged in writing. Operating directions may be given directly by telephone, by use of the public address/page system, or by portable radio.

When appropriate, operating directions shall be given with specific control bands. A specific control band shall be included as part of the operating directive. For example, when a supervisor, over a radio or phone, directs a technician to maintain a Particle Accelerator Magnet voltage below 420 volts, the verbal direction should be given as follows: "Beam technician, maintain Magnet voltage between 420 and 410 volts." The Beam technician should respond "Understand to maintain Magnet voltage between 420 and 410 volts." The supervisor should then respond "That is affirmative."

If an operator is given a directive to perform an action, and the operator cannot or believes they cannot follow the directive, then the operator is obligated to communicate those concerns to the originator of the directive or to management.

The following requirements are normally applicable to verbal directions:

- The instructions are given using clear, concise, expressions, and terminology. When alpha-numeric information is being communicated, use the phonetic alphabet (Attachment A) to minimize misinterpretation.
- Directions are explicit and understandable, including the following types of information:
 - who is giving the direction
 - who is to perform the action
 - what is to be done and if time permits, why
 - when it is to be done
 - if applicable, to use a procedure
 - additional communications required (e.g., when to report back)

If the recipient repeats or paraphrases the message incorrectly, the originator immediately shall correct the recipient by saying "Wrong" and repeat the message.

Multiple actions shall not be contained in a verbal instruction. It is preferable to report back for additional instructions.

The completion of Shift Supervisor ordered actions shall be reported to the Shift Supervisor. This communication shall be acknowledged by the Shift Supervisor.

Some verbal instructions may need to be supplemented with written guidance to ensure important information is not forgotten.

Clarity—The message shall be as free from ambiguity as possible.

If the recipient does not understand the message, the recipient shall ask the originator to repeat or rephrase the message.

When practicable, the person giving the direction should observe displays and note any confirming information (valve position lights, pressure, level voltage, current, flow, etc.)

5.6.2 General Attributes of Good Communication

- Ensure the identity of the people are clearly understood. Identify yourself and your position and insure that you know to whom you are speaking, by both name and position.
- Use clear, precise, terminology. Do not use slang terms. Avoid words that sound alike (e.g., avoid the use of "increase" and "decrease", rather use "raise" and "lower"). Use commonly agreed upon terms.
- Use both the noun name and number of equipment.
- Repeat back messages, either paraphrased or verbatim.
- Speak distinctly and deliberately.
- Acknowledge all communications.
- Do not include multiple actions in a verbal instruction which could be confused or misunderstood. Either write down the instructions or give several, short directions which occur upon the completion of the preceding task.

5.7 TELEPHONE

To ensure accurate and timely verbal communications via radio or telephone, the following communication practices should be used. These practices are to be used both during normal and emergency operation communications:

- Answer phone and radio with your name and position.

Example: "George Westinghouse, Central control room supervisor."

- Begin the communication by stating your name and position, followed by the first communication statement.

Example: "This is George Westinghouse, Central Control Room Supervisor. Start Two Bravo Magnet Generator. Report back when you have established 410 plus or minus 10 volts output."

Once initial identification of the sender and receiver has been established, it need not be repeated with each message, the telephone is a point-to-point system.

5.8 PORTABLE RADIOS

Sender and receiver identification shall be included in each message.

Portable radio communications shall be tested prior to conducting a procedure that requires radio communication and anytime its operability is in doubt.

Radio communication equipment used in normal operations shall be used in an emergency to communicate with mobile units.

5.9 PERSONAL PAGERS

Personal pagers or other suitable means shall be provided to personnel working in areas where the facility paging system cannot be heard.

Personal pagers that vibrate and can be felt or flashing lights shall be used in work areas with high noise levels.

5.10 TESTING COMMUNICATION LINKS

Dial telephones and facility communication phones shall be tested periodically to ensure they are operable.

All facility areas shall be checked periodically to ensure personnel can be alerted to emergency conditions. In high-noise areas, the use of flashing lights or personnel dedicated to making notification in person are acceptable alternatives to the public address system.

A periodic survey shall be conducted to ensure all on-duty shift personnel can be contacted quickly in all areas.

6.0 REFERENCES

1. DOE Order 5480.19, Conduct of Operations Requirements for DOE Facilities.

7.0 ATTACHMENTS

Attachment A Phonetic Alphabet

ATTACHMENT A

PHONETIC ALPHABET

Use the phonetic-alphabet when alpha-numeric information is being communicated to minimize misinterpretation.

A- Alpha	N- November
B- Bravo	O- Oscar
C- Charlie	P- Papa
D- Delta	Q- Quebec
E- Echo	R- Romeo
F- Foxtrot	S- Sierra
G- Golf	T- Tango
H- Hotel	U- Uniform
I- India	V- Victor
J- Juliett	W- Whiskey
K- Kilo	X- X-Ray
L- Lima	Y- Yankee
M- Mike	Z- Zulu

WESTINGHOUSE CONDUCT OF
OPERATIONS MANUAL

COMMUNICATIONS (U)

Manual
Chapter
Page
Effective Date

WHC-SP-0708
4, Rev 1
8 of 8
January 1, 1994

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1.0 PURPOSE

Facility operation by personnel under instruction shall be carefully supervised and controlled to avoid mistakes in operations by unqualified personnel and to use trainees' time effectively. This chapter establishes guidelines for conducting an on-shift training program in a manner such that the trainee satisfactorily completes all of the required training objectives and receives maximum learning benefit from the experience while facility operation is maintained in a safe manner.

2.0 SCOPE

On-shift training is normally controlled by the operations organization personnel because the operation of equipment is usually involved. Operations administered controls are appropriate for the following aspects of the training activities:

- On-shift training shall adhere to established training programs so that instructional uniformity will be maintained.
- On-shift instructors/evaluators shall be qualified for the activities they perform to ensure both correct operation and quality training.
- Trainees shall be supervised by qualified operators so that unqualified personnel do not make mistakes that could affect safety.
- Policies that direct how trainees may be used to support operations work activities shall be developed. These policies shall ensure that trainee personnel are effectively and appropriately used and that they are aware of all operating limits and hazards.
- On-shift training shall be appropriately documented.

3.0 DEFINITIONS

ON-SHIFT TRAINING (OST) (sometimes referred to as on-the-job training) - That portion of an operator qualification program where the trainee receives training within the job environment and with as much hands-on experience as possible.

4.0 RESPONSIBILITIES

The Facility Manager (or equivalent) shall approve the training program so that it will best meet operations needs.

The Shift Supervisor shall assure implementation and involvement of their personnel in proper on-shift training.

The Training Department shall develop a facility on-shift training program.

5.0 PROCEDURE

5.1 ADHERENCE TO TRAINING PROGRAMS

On-shift training shall be conducted in accordance with training programs that specifically identify items the trainee must accomplish on shift. The knowledge requirements for each item shall be defined as well as what the trainee must do (perform, simulate, observe, or discuss). Both the instructor and the trainee shall understand what is required for each training item.

5.2 ON-SHIFT INSTRUCTOR QUALIFICATION

On-shift training shall be conducted by individuals formally qualified in the operation of the system or process involved and will require the successful completion of appropriate instructor training requirements for on-shift training. However, operator-qualified training department personnel may also be used. The on-shift instructors shall be specifically selected, taking into account communication skills, technical knowledge, and ability to provide trainees with hands-on experience. In many cases, the trainees will actually be operating equipment; this requires special instructor techniques in order to prevent misoperation or damage of equipment.

5.3 QUALIFIED OPERATOR SUPERVISION AND CONTROL OF TRAINEES

Whenever trainees operate equipment, a qualified operator serving as an on-shift instructor shall observe the trainee in order to ensure the trainee does not make an error that could adversely impact the facility. Until the trainee has demonstrated reasonable proficiency in an operation, they shall discuss the procedure steps, cautions, and notes with the instructor. Trainees shall also demonstrate actions to be performed by pointing to the control switch, valve, breaker, etc., that will be manipulated.

On-shift instructors shall not become complacent with trainees. Just because a trainee has previously performed a task does not mean the trainee is aware of all problems that could occur. The instructor shall always monitor the trainee closely and remain in a position to intervene or assume control, if necessary.

When trainees record equipment parameters on official round sheets (as opposed to practice roundsheets) or logs, the on-shift instructor shall verify that the recorded information is correct. In addition, the trainee and on-shift

instructor shall discuss any out-of-specification reading and the consequences of allowing such a trend to continue.

5.4 OPERATOR QUALIFICATION PROGRAM APPROVAL

The operator qualification program shall be approved by the Facility Manager, and changes to the program shall be coordinated with the training department. For operating positions requiring certification, qualifications shall be based on one-to-one instruction at that station.

5.5 TRAINING DOCUMENTATION

Completion of the operator qualification program shall be formally documented. Classroom requirements and written exam results shall be documented by the training department instructors. On-shift training and system checkout shall be documented by on-shift instructors.

5.6 SUSPENSION OF TRAINING

Trainee operation of equipment shall be immediately suspended during unanticipated or abnormal events, accident conditions, or whenever the operations personnel or on-shift instructor believes suspension is necessary to ensure safe and reliable facility operation. During abnormal or accident conditions, trainees shall provide assistance at the discretion of the qualified operator.

5.7 MAXIMUM NUMBER OF TRAINEES

The maximum number of trainees allowed to simultaneously participate in any particular training evolution shall be considered. Consideration shall be given to training effectiveness and to the potential for adverse effects on the facility. A maximum limit for the trainee-to-instructor ratio will ensure that the trainee is provided with the most effective instruction and will ensure that the instructor is not distracted by having too many trainees at once. Shift Supervisors shall ensure that established limits are observed.

5.8 ELEMENTS OF ON-SHIFT TRAINING (OST)

Effective OST involves four elements:

- The objectives of OST (what the trainee is expected to know/perform when training is completed) must be known to the trainer/evaluator and the trainee.

- The standards for successful completion of OST (skill and knowledge performance criteria) must also be known by the trainer/evaluator and the trainee.
- The trainer/evaluator must have the knowledge and ability to teach/evaluate the trainee in accordance with the training objectives and standards.
- The training and competency of the trainees must be documented as factors in the qualification process; to provide feedback to the training system and to meet training record requirements.

Once appropriate objectives and standards are established, training on each task or grouping of like tasks, is conducted in two distinct steps: the trainee is taught, and the trainee is evaluated. The teaching step may be accomplished by trainee self-study, observation, discussion, simulation, and/or performance under the supervision of qualified job incumbent or trainer. The evaluation step is typically a "checkout" in which the trainee performs or simulates a task under the scrutiny of an evaluator and/or discusses the task if necessary. Both the teaching and evaluation steps are essential to effective OST programs. The results of these steps are then documented to satisfy training record requirements and to provide input to the formal qualification process as appropriate.

5.9 ADMINISTRATIVE POLICIES FOR IMPLEMENTATION OF ON-SHIFT TRAINING (OST)

In order to enhance the effectiveness of OST, controls should be established governing trainee prerequisites, trainer/evaluator qualifications, and program coordination. Such controls may be established through administrative policies or procedures.

The process of determining program content, the establishment of performance standards, and implementation of the program are enhanced significantly by the participation of line managers and supervisors. It is essential that they become involved and provide resources and technical input, as well as administrative guidance on the commitment of schedules and to the qualification process and its relation to the work assignment.

5.10 COORDINATION OF ON-SHIFT TRAINING (OST)

Policies or procedures should assign responsibility to selected individuals for coordinating OST programs. The role of the coordinator should include the following activities:

- Assigning target dates for trainees to reach milestones and complete the program.

- Monitoring trainee progress.
- Providing training material and assistance to trainees and trainers/evaluators.
- Coordinating training assignments to take advantage of unusual or infrequent job-related activities.
- Documenting training as it is completed.
- Informing appropriate supervisors of training problems and of individuals' progress in completing OST.
- Evaluating training effectiveness and factoring feedback from job performance into the training program.
- Ensuring documentation of completion of OST requirements exists prior to the trainee being assigned jobs/tasks.

5.11 CONDUCT OF ON-SHIFT TRAINING (OST)

The general steps involved in the conduct of OST should be understood by trainees/evaluators. The following process can be utilized for conducting the training and evaluation phases of OST.

5.11.1 Training Phase

The following training sequence is recommended:

Trainee is provided with OST materials, including the following:

- Instructions in the use of OST materials
- Schedule of target dates
- OST evaluation checklists, objectives, and references
- Supporting study material (prints, procedures, system descriptions, etc.)

Trainee studies references and material related to one or more OST items.

- Trainer demonstrates proper performance of the task if practical. During this demonstration, the trainer explains potential consequences of improper performance, provides "how-to" information, and answers questions. This is an appropriate time to discuss lessons learned from specific job-related industry operating experience.

CONTROL OF ON-SHIFT TRAINING (U)

Trainee conducts, discusses, and/or walks through the item (s) with a qualified OST trainer.

- Trainer corrects performance problems observed and helps the trainee learn from his mistakes.

When confident of having mastered OST item(s), trainee requests checkout from qualified OST evaluator for the item(s).

5.11.2 EVALUATION PHASE

The following evaluation sequence is recommended:

- Evaluator schedules checkout.
- Evaluator conducts checkout using the standards to evaluate trainee's knowledge/skills.

If trainee knowledge and skills are satisfactory, evaluator signs the item off. If not, the evaluator identifies areas for further study/practice, initials items, and directs trainee to return for another checkout when noted weaknesses have been upgraded.

Evaluator provides feedback to trainer if performance deficiencies are noted. Such feedback should be used to improve the training process.

6.0 REFERENCES

1. DOE Order 5480.19, Conduct of Operations Requirements for DOE Facilities.

7.0 ATTACHMENTS

None

INVESTIGATION OF ABNORMAL EVENTS (U)

1.0 PURPOSE

The purpose of this chapter is to cover important aspects of abnormal event investigation to ensure that facility events are thoroughly investigated to assess the impact of the event to determine the root cause of the event, to ascertain whether the event is reportable to the DOE in accordance with DOE Order 5000.3A, OCCURRENCE REPORTING AND PROCESSING OF OPERATIONS INFORMATION, and to identify corrective actions to prevent recurrence of the event. "Near miss" situations will also be investigated to reduce the probability of a similar situation recurring as an actual facility event. Since abnormal events are not unique to the operating organizations, the guidelines brought out in this chapter may have applicability in other areas of a facility. Required notifications associated with abnormal events are addressed in Chapter 7 and in DOE 5000.3A.

This chapter describes the responsibilities and activities required for the preparation of critiques. The goal of having a critique is to capture all the facts related to the event, evaluate them for proper immediate actions, and ensure that we learn from the event to prevent its recurrence. Additionally, the critique process frequently uncovers areas that need improvement that were not directly involved with the incident itself. Critiques are not performed to assign blame to individuals, but rather to determine the truth.

2.0 SCOPE

An established and thorough review process shall ensure that all significant aspects of an abnormal event or "near miss" situation are identified, investigated, and resolved. In addition, the investigation of "near miss" situations can identify detrimental conditions that, if left uncorrected, can impact safety and operations.

A comprehensive review program shall identify those types of events that require investigation, assign responsibility for conducting the investigation, list necessary qualifications for those conducting investigations, list the necessary information that must be examined, outline the steps for performing an investigation, and establish guidelines for assigning and completing corrective action.

It is helpful to define which circumstances should result in an abnormal event investigation. The criteria shall be available to first line supervisors so that, following an event, the investigation process can begin in a timely manner. The list of events or criteria requiring an event investigation shall be based on DOE requirements. These requirements include such considerations as personnel safety, facility safety and reliability, and DOE requirements. A manager shall have overall responsibility for the event investigation process. However, the manager may delegate specific investigative tasks to other personnel as appropriate. Investigator qualifications shall be

established to ensure competency in technical aspects of operation and investigative techniques. The credibility of the investigation process will depend heavily on the credibility of the event investigators.

The process of performing an abnormal event investigation shall be established to ensure the thoroughness of each investigation and to ensure consistency between investigations. The program shall describe the information collected, investigative techniques utilized, and the final reporting format. Two important products of the event investigation are the identification of the root cause and assignment of corrective action to prevent recurrence.

The abnormal event investigation program is needed to thoroughly investigate abnormal events, verify the proper operation of equipment, identify the root cause of events, ensure all necessary notifications are completed, comply with DOE requirements, and ensure appropriate corrective action steps are established to minimize the chance of the event recurring. Operations personnel shall recognize this need as well as their obligation to assist in performing thorough investigations.

Critiques shall accomplish three objectives:

- Determine whether the immediate actions taken have stabilized the Facility, maintained the Facility in a safe condition, and corrected the event.
- Gather information and data to be used for subsequent investigation, if necessary.
- Reconstruct the event in sufficient detail to allow accurate analysis of the event.

3.0 DEFINITIONS

CATEGORIZATION - relative ranking of an occurrence to ensure that the urgency of notification is readily identifiable and that more serious occurrences are highlighted to management.

EMERGENCIES - emergencies are the most serious occurrences and require an increased alert status for onsite personnel and, in specified cases, for offsite authorities.

NEAR MISS - a situation which an inappropriate action occurs (or a necessary action is omitted) but is detected and corrected before an adverse effect on personnel or equipment results.

ROOT CAUSE - an underlying or initiating event or condition, within management control, that produces the failure of a component which, if corrected, will mitigate the occurrence/recurrence.

INVESTIGATION OF ABNORMAL EVENTS (U)

CRITIQUE - a meeting of the persons who were involved in or who knew anything about an event (good or off-normal) to document a chronological listing of the facts.

CRITIQUE LEADER - a person trained in the critique process and procedure to manage critique meetings.

ABNORMAL EVENT - any deviation from the planned or expected event, condition, or operation of the Facility if the deviation has impacted, or could impact, safe operation, or has environmental protection, ~~safety~~, or health protection significance. In the context of this procedure, "event" is synonymous with "Abnormal Event."

CRITIQUE TEAM - the people present at the critique meeting. The Critique Team shall consist of at least the Facility Manager or his designee, the Critique Leader, all personnel involved with the event, a Safety Engineer if appropriate, a Critique Recorder, and any system experts needed to explain system design or operation. A DOE representative will be invited, and a Shift Advisor should attend if the critique is operations related.

CORRECTIVE ACTION - action taken to correct an event and prevent its recurrence.

IMMEDIATE CORRECTIVE ACTION - corrective action taken at the time of the event to mitigate the event, and bring the facility to a safe condition. Immediate corrective action is also the additional corrective actions taken at the direction of the Facility Manager as a result of the critique.

SUGGESTED CORRECTIVE ACTION - corrective action stemming from the critique report that are long-term in nature. These corrective actions are not commitments to action until reviewed and authorized by the department writing the critique.

LESSON-LEARNED COMMITTEE - an Operations group charged with ensuring Operations takes satisfactory action on all its events and critiques, correcting the situation, and preventing event recurrence, taking into account all reviews and analysis performed, e.g., UOR, RER, etc.

4.0 RESPONSIBILITIES

4.1 ALL PERSONNEL

All personnel are responsible for promptly notifying management of events and conditions which could have adverse safety, health, quality assurance, security, operational, or environmental implications.

4.2 FACILITY MANAGER

The Facility Manager or his designee, is responsible for event investigations as follows:

- Ensuring the immediate corrective actions taken subsequent to the event are satisfactory to correct the event
- Ensuring critiques are initiated for all situations required by this procedure
- Ensuring critiques are conducted in accordance with this procedure
- Assigning a Critique Leader for each critique
- Attending all critiques
- Reviewing and approving critique reports
- Assigning responsibility for immediate corrective actions within their responsible area, or getting responsibility through department managers when outside their group
- Requesting other departments to provide the necessary support for critiques when needed
- Ensuring all corrective actions associated with their facility are completed on schedule
- Ensuring necessary actions to prevent recurrence of operations related events
- Ensuring the corrective actions taken in response to any given event are satisfactory to mitigate the event and prevent recurrence
- Reviewing all critiques, looking for and acting upon event trends
- Reviewing Suggested Corrective Actions in each Operations Department critique report and authorizing such for commitment\

5.0 PROCEDURE

5.1 EVENTS REQUIRING INVESTIGATION

Events requiring investigation are those events that occur in the facility and adversely affect operations, personnel safety, or DOE requirements (DOE 5000.3A). In general, any event (bad or good) whose analysis and

INVESTIGATION OF ABNORMAL EVENTS (U)

documentation would benefit the organization (or others) shall be documented. The criteria for when to perform an event investigation should be clearly established. Specific events requiring investigation should be listed for supervisory use, along with criteria for use in deciding what "near miss" situations should receive review. The following conditions and situations at a minimum shall require an investigation:

- Design limits violated (Tech Specs, OSR, SAR, or other limits).
- Facility system performance is unusual, abnormal, or unexplained;
- Facility safety conditions are abnormal or unexplained;
- Reportability to DOE or other agencies (e.g., EPA) is appropriate;
- An unplanned shutdown or significant loss of operation occurs;
- Safety or system features are improperly positioned;
- Procedural violation or personnel error occurs that caused or could have caused serious personnel injury or equipment damage that could have affected facility safety.
- Equipment failure occurs that could affect facility capability or safety;
- Radiological or toxic material limits are exceeded or radioactive or toxic material is lost/released;
- Actual or attempted sabotage is suspected;
- Chemistry or process parameters are out of specification or indicate unexplained trends;
- A department head or the facility Safety Review Committee deems an investigation is appropriate;
- Loss of special nuclear material;
- Repetitive problems occur.

The above list is not intended to be all-inclusive. At the discretion of the operations supervisor (or other appropriate department head), other specific events should receive a formal investigation.

"Near miss" situations are reviewed to uncover aspects of the situation that, if not identified or corrected, can cause recurrence of the event, possibly with more serious consequences.

5.2 ELEMENTS OF A GOOD CRITIQUE PROCESS

- Both off-normal events and successes are critiqued.
- Designation of who calls and conducts the meeting(s). Beware of prejudice and influence. It may be necessary to assign a leader who was not involved in the event.
- A critique is a formal meeting. It may consist of several meetings with a combination of personnel.
- All who can contribute attend the critique meeting(s).
- The DOE Facility Representative is notified of, and invited to attend, all critiques.
- Critique meetings are, with few exceptions, held as soon as the situation is stable. Normally a critique should be held before the involved people leave for the day. Exceptions should be approved by the Facility Manager.
- Initial categorization and notification for Order 5000.3A is made before, or concurrently with the critique meeting.
- Key, involved persons write personal statements: What I did, saw, heard, etc.
- Statements are preferably prepared before the critique meeting starts, and before the key, involved people get together to discuss the event. The intent is not to prevent people from "getting their story straight", but that one's memory of an event can be influenced by the types of discussions held during a critique. The intent behind getting written statements is to obtain raw data that can later be interpreted and compared to other people's observations. These statements should not be considered a "witch hunt" or an attempt to assign blame.
- Personal statements are signed and dated.
- Completed personal statements are provided to the leader at the critique meeting. They are attached to the meeting minutes and become part of the official record.
- Formal meeting minutes are recorded. Facts shall be listed in chronological order. Tape recorders, stenographers, etc., are used to help document the minutes. (See Attachment B for an example.)
- Critique minutes are signed by the leader and all contributors.

- A pre-designed form helps to guide the leader through the critique process. It provides the line of questioning and includes places for the pertinent information.
- Critique minutes include a listing of what happened in chronological order (Attachment B).
- The Critique minutes are factual. They serve as the record of what happened for simple events and the foundation for any subsequent investigation, if warranted, for more complete events.
- Categorization and/or notification may be changed when the critique is completed.
- Critique minutes facilitate the assigning of corrective action and provide the basis from which root cause/recurrence control can be determined.
- Critique reports are distributed within the facility, to other selected facilities, to DOE, and to a central organization for the purposes of further distribution and analysis.
- Persons designated as critique leaders are formally trained for the task.
- A critique attendance sheet (Attachment C) shall be completed.

5.3 THE CRITIQUE

Critiques will be held as soon as possible (within hours) after the situation has been stabilized. If possible, the critique shall be scheduled during or immediately following the shift in which the event occurred, to facilitate discussion and interviews while events are still fresh in the minds of those involved.

The Critique Leader shall present a synopsis of the event to the critique team. The presentation shall include all information necessary to explain the event. Not everyone attending the critique may be familiar with the system or operation under investigation, so a brief explanation of the system design or procedure should be given. Show system diagrams, slides, handouts, operating and maintenance procedures, etc. A system expert should be present at the critique to answer questions about the system.

The critique team should first chronologically reconstruct the event, using collected data. The scope of the investigation must span from before the event occurred to after the situation was stabilized. Pertinent alarms,

trips, actuations, and isolations will be listed in the sequence of events. Relevant facility parameters should be incorporated into the chronological list of events during reconstruction.

After reconstructing the event and establishing clearly what happened in the event, the critique team will determine whether the immediate corrective actions taken were satisfactory to maintain the facility in a safe condition, mitigate the event, and prevent its recurrence.

5.4 INVESTIGATION RESPONSIBILITY

The Shift Supervisor or other designated manager shall be responsible for event investigations.

Portions of the investigations may be delegated to other personnel. For example, the initial review following a reactor trip might be conducted by the Shift Supervisor. Based on the results of the Shift Supervisor investigation, the need for further review will be established. Example of specific tasks of an investigation that may be delegated include gathering necessary records, conducting interviews, recommendations, and determining the long-term corrective action to prevent recurrence. However, the overall responsibility for the consistency and thoroughness of event investigations should be the responsibility of the appropriate manager.

5.5 INVESTIGATOR QUALIFICATION

The credibility of the investigative process is highly dependent upon the knowledge and experience of the individuals performing the investigation.

Individuals performing an investigation shall be technically knowledgeable and well respected by the facility staff.

Investigators shall not have a bias or a vested interest in the results of the investigation.

Investigators shall be trained in facility systems and operations and other major disciplines appropriate for the event under investigation.

Investigators shall be trained in techniques for conducting an investigation which include areas such as root cause determination, diagnostics for plant events, interviewing techniques, and factors affecting human performance.

5.6 INFORMATION TO BE GATHERED

Sufficient data must be collected to allow the event investigators to perform a reconstruction and analysis of the event.

INVESTIGATION OF ABNORMAL EVENTS (U)

An individual shall be assigned responsibility for collecting the required information and assembling the information for review.

It is important to collect the necessary information as soon as possible after the event to minimize the possibility of losing information or that observers of the event will be unavailable. This information shall include:

- Initial facility conditions.
- Statements of personnel involved in the events (this should be permanently recorded see Attachment A).
- Pertinent computer printouts (post-trip log sequence of events) and strip charts.
- Pertinent documentation (such as logs, radiation work permits, chemistry logs, radiological surveys, etc.) as required to establish conditions prior to and during the event.
- Immediate corrective action taken.

As listed above, statements of operators and facility personnel involved in the event should be obtained. This item is particularly useful because personnel observing or participating in an event can provide insights into the facility response during the event and into actions leading up to the event that would be not available from strip charts or other hard copy data. Methods for collecting this information can vary; however, the event investigation containing relevant information should be permanently recorded for future reference.

When collecting hard copy (such as strip charts), it is important to annotate the data with its source, chart speed (if applicable), and a time mark to aid in coordinating the data during the reconstruction of the event. The collection of data should not interfere with the continued operation of the facility. Temporary interference should occur only if necessary to understand the event.

5.7 EVENT INVESTIGATION

Upon completion of the data collection, a structured review of the abnormal event shall occur. The format of the investigation will depend upon the significance of the event. Each event investigation shall include the following steps, with emphasis placed on each individual step depending upon the severity or potential consequences of the event.

5.7.1 Event Reconstruction

Events should be reconstructed using the collected information. If available, this can best be accomplished using the sequence of events recorder printouts as a basis. If the sequence of events printout is not available (or not applicable) or if the abnormal event was not of significant magnitude or nature to impact the sequence of events recorder, then a chronological listing of events shall be developed. It is desirable to include personnel involved in the event in the reconstruction process.

5.7.2 Event Analysis and Evaluation

Once the facts of the event have been established, the event shall be analyzed to determine the response of equipment and involved personnel. Emphasis shall be placed on determining the proper response of systems, comparison of actual and expected response, adequacy of procedures, and factors affecting human performance. The event shall be compared with previous event investigations of similar events or transients. During the analysis, a safety evaluation should be performed to ascertain the proper response of equipment and to identify detrimental effects on facility equipment. If the event was a process shutdown, the acceptability of restart may be determined at this time. In some instances, however, root cause determination and corrective action determination may also be required prior to restart. Supervisors need to be sure no further corrective action is required prior to restart.

5.7.3 Root-Cause Determination

The root causes of the event shall be determined. Root causes can be defined as those causal factors that, if corrected, would preclude a recurrence of the event.

5.7.4 Corrective Action Determination

Appropriate corrective action shall be established for each event investigation, and specific personnel shall be assigned responsibility for the corrective action. Corrective actions can take the form of procedure changes, training, design modifications, and changes to administrative controls. The final approval for corrective action should be made by the Facility Manager.

5.8 INVESTIGATIVE REPORT

An investigative report shall be prepared in a timeframe determined by the responsible authority.

INVESTIGATION OF ABNORMAL EVENTS (U)

The report shall include a description of the event (including pertinent conditions), a discussion of the impact of the event, root cause, lessons learned, and proposed corrective action(s).

The report shall include positive aspects of the event (such as particularly effective personnel responses).

The investigative report shall be approved by the Facility Manager and reviewed by appropriate supervisors, managers, and if required, the Safety Review Committee.

It is important that the lessons learned from an event investigation be shared with all appropriate personnel who could benefit from the lessons learned. For example, a problem with an operations procedure might also exist in another department's procedures.

5.9 EVENT TRAINING

Events shall be evaluated by the Shift Supervisor to determine if events shall be included in personnel training programs.

Due to the severity or possible safety consequences, it may be appropriate to train personnel on the event immediately.

A program shall be in place for personnel to be immediately trained on an event when they next report to work.

5.10 EVENT TRENDING

Patterns of deficiencies such as operator errors or inadequate procedures shall be trended.

A periodic summary report of events, causes, and trends shall be submitted to department heads, the Facility Manager and other appropriate managers.

Department heads shall ensure that training programs include appropriate material from the summary report.

5.11 SABOTAGE OR TAMPERING

Acts of known or suspected sabotage or tampering are a special case of event investigations. If an act of sabotage or tampering is discovered or suspected, it is important that safety of the facility receive paramount consideration. An investigation that incorporates assessing facility or

systems status must begin immediately. The following factors should be included:

- Stabilize operations as they currently exist; do not introduce transients or changes until system and component reliability can be positively established. Establish a two-man rule for all activities.
- Determine the condition and ensure the operability of all safety-related systems that are needed to safely-shutdown, terminate operation or to maintain the facility in a stable condition; consideration should be given to passive surveillances.
- Before conducting surveillance tests to ensure operability of key components or systems, be prepared and assume that they have been tampered with; be able to take remedial measures if the test fails.
- As part of the investigation process, "freeze" the facts; use of photographs, video tape, documented interviews, may be desirable, especially if the component or system configuration needs to be altered for safety or environmental reasons.
- Based on the facts established during the initial investigation, including any testing, decide if continued operation is justified or if systems are available to support a safe and orderly facility shutdown or termination of activities.
- If the facts established during the initial investigation verify sabotage or tampering, establish communications immediately with DOE.
- Minimize the impact of discovered acts of sabotage and deter future acts of sabotage.

6.0 REFERENCES

1. DOE Order 5480.19, Conduct of Operations Requirements for DOE Facilities.
2. DOE Order 5000.3A, Occurrence Reporting

7.0 ATTACHMENTS

- Attachment A Example Personnel Statement Form
- Attachment B Example Critique Report
- Attachment C Example Critique Attendance Sheet
- Attachment D Example Apparent Causes, Immediate Corrective Actions, Suggested Corrective Actions

ATTACHMENT A

EXAMPLE PERSONNEL STATEMENT

Date: _____ Revision: _____

Critique Title: _____

Critique Number: _____

In your own words, write down what happened in the event. Include any information from before the event began until after it was over. Include the following:

1. Plant conditions as you know them prior to the event.
2. Any indications that a problem existed.
3. List any equipment malfunctions.
4. What you were doing immediately prior to the event.
5. Your actions in response to the indications.
6. List any inadequacies in the procedures, practices, or training.

Completed By: _____ Signature: _____

Date: _____ Time: _____ a.m./p.m.

If additional sheets are used sign, date, and record time on each page.
Include critique number and title.

ATTACHMENT B

EXAMPLE CRITIQUE REPORT

Date: _____

Revision: _____

Critique Title: _____

Critique Number: _____

Date and time of critique: _____

Name of Critique Director: _____

Department performing critique: _____

SUMMARY OF THE EVENT:

References/Procedures applicable to the event:

CRITIQUE REPORT APPROVAL

Critique Leader Signature: _____ Date: _____

Lead Manager Signature: _____ Date: _____

A Representative of Each Organization: _____ Date: _____

at the Critique Signature: _____ Date: _____

_____ Date: _____

Detailed Chronology of Event:

[illegible]

ATTACHMENT D

EXAMPLE CRITIQUE REPORT

Apparent Causes

Date: _____

Revision: _____

Critique Title: _____

Critique Number: _____

1. Apparent Cause: _____

2. Apparent Cause: _____

3. Apparent Cause: _____

4. Apparent Cause: _____

5. Apparent Cause: _____

ATTACHMENT D

EXAMPLE CRITIQUE REPORT

Immediate Corrective Actions

Date: _____ Revision: _____

Critique Title: _____

Critique Number: _____

1. Action: _____

Response to Apparent Cause #: _____ Date Due: _____

Responsibility (Name): _____

2. Action: _____

Response to Apparent Cause #: _____ Date Due: _____

Responsibility (Name): _____

3. Action: _____

Response to Apparent Cause #: _____ Date Due: _____

Responsibility (Name): _____

4. Action: _____

Response to Apparent Cause #: _____ Date Due: _____

Responsibility (Name): _____

ATTACHMENT D

EXAMPLE CRITIQUE REPORT

Suggested Corrective Actions

Date: _____

Revision: _____

Critique Title: _____

Critique Number: _____

1. Action: _____

Response to Apparent Cause #: _____

2. Action: _____

Response to Apparent Cause #: _____

3. Action: _____

Response to Apparent Cause #: _____

4. Action: _____

Response to Apparent Cause #: _____

WESTINGHOUSE CONDUCT OF
OPERATIONS MANUAL

INVESTIGATION OF ABNORMAL EVENTS (U)

Manual
Chapter
Page
Effective Date

WHC-SP-0708
6, Rev 1
20 of 20
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1.0 PURPOSE

This chapter describes the requirements for timely notification of DOE and other appropriate agencies of events, conditions, or concerns that have or may have safety, health, quality assurance, security, or environmental concerns. Timely notification should be employed to ensure that the facility is responsive to public health and safety concerns.

2.0 SCOPE

This chapter provides guidelines to ensure uniformity, efficiency, and thoroughness of notifications to support fulfillment of DOE requirements that are consistent with DOE Order 5000.3A.

For events that require notification of DOE personnel (and when appropriate, state and local officials), it is essential that information be gathered and transferred in a systematic, controlled method. Procedures that define responsibilities and provide for adequate documentation should be used to control the process and ensure that the notification procedure is effective.

3.0 DEFINITIONS

CONCERN - matter of interest that may involve an event or condition adverse to safety, health, quality assurance, security, or has environmental implications.

CONDITION - as-found state, whether or not resulting from an event, which may involve adverse safety, health, quality assurance, security, or environmental implications. A condition differs from an event in that an event is a real-time occurrence (e.g., pipe break, valve failure, loss of power), whereas a condition is more programmatic in nature. For example, technical inadequacy, such as an error in analyses or calculation; an anomaly associated with design or performance; or an item indicating a weakness in the management process.

EVENT - a real-time occurrence or incident that may involve safety, health, quality assurance, security, or environmental considerations and includes industrial accidents, fires, personal injuries, equipment damage or malfunction (e.g., pipe break, valve failure), severe weather, higher than expected levels of contamination or radiation, operating anomalies (e.g., loss of power), transients and test, or experiments not completed as planned or that produced unexpected results (e.g., unsatisfactory surveillance test).

4.0 RESPONSIBILITIES

Personnel shall report events, conditions and concerns to their immediate supervisor or if the immediate supervisor is not available, report to the site specific individual responsible for emergency reporting.

Immediate supervision shall report events, conditions, and concerns to the site specific individual responsible for emergency reporting.

5.0 PROCEDURE

5.1 GENERAL

Upon discovery of an emergency or non-routine event, personnel shall take immediate actions to ensure their own safety. If appropriate, personnel shall warn other employees who may be affected. Then, as soon as possible, personnel shall report the event to their immediate supervisor. If the immediate supervisor is not available, personnel shall report the event directly to the site specific individual responsible for emergency reporting.

The immediate supervisor shall immediately report via radio or telephone the event to the site specific individual responsible for emergency reporting. Additional actions by the immediate supervisor may be required when requested by the site specific individual responsible for emergency reporting.

All notifications shall be in accordance with site specific emergency reporting procedures implementing DOE Order 5000.3A.

5.2 NOTIFICATION PROCEDURES

Site specific emergency reporting procedures shall be developed to address appropriate notifications and shall include the following elements:

- Specific responsibilities for notifications.
- Identification of events and conditions requiring notification.
- Identification of primary and alternate personnel to be notified for various situations.
- Establishment of time requirements for notifications that are consistent with the facility emergency plan.
- Definition of record keeping requirements that documents the reason for notifications, the time of notifications, and the person notified.

NOTIFICATIONS (U)

5.3 NOTIFICATION RESPONSIBILITY

The Shift Supervisor shall ensure that all appropriate personnel receive notification when required.

The actual notification of specific individuals or agencies may be accomplished by other individuals.

5.4 NAMES AND PHONE NUMBERS

Names of primary and alternate contacts and current phone numbers and page codes shall be readily available to the person assigned to make the notifications.

5.5 DOCUMENTATION

All notifications shall be documented and a formal record of notifications shall be maintained.

- Fill-in-the-blank forms for different types of situations may be useful as a checklist and for providing necessary documentation.

5.6 COMMUNICATION EQUIPMENT

Adequate communication equipment shall be maintained in the facility control area to meet the objectives of this procedure.

6.0 REFERENCES

1. DOE Order 5480.19, Conduct of Operations Requirements for DOE Facilities.
2. DOE Order 5000.3A, Occurrence Reporting.
3. DOE Order 5500.2A, Emergency Notification, Reporting and Response Levels.

7.0 ATTACHMENTS

| Attachment A Sample Notification Checklist

ATTACHMENT A

SAMPLE NOTIFICATION CHECKLIST

Event Report No. ____ Today's Date ____ Page ____ of ____

1. Hello, my Name is Caller's Name, Social Security Number Your SS Number, I
2. am the Your Title at the Facility Name Facility.
3. Is this Agency? To whom am I speaking Name?
4. I want to report an event at time hours. (military time on Date,

THE EVENT DESCRIPTION

5. The Brief Description of event

THE EVENT STATUS

(Attach additional pages if needed)

6. The Situation is now Stable, Unstable, Under control, Unknown, and No assistance, or the following assistance is required at this time.

THE EVENT CLASSIFICATION

8. This is the initial or updated notification and this event is being classified as Off Normal.
9. Unusual Occurrence, Emergency

OTHERS NOTIFIED

10. Company Senior Site Manager
11. Others and organizations, ____
12. Date ____ and time of this notification . Signed by ____ Approved ____

CONTROL OF EQUIPMENT AND SYSTEM STATUS (U)

1.0 PURPOSE

This chapter provides direction for control of equipment and system status to ensure that facility configuration is maintained in accordance with procedural requirements and that operating shift personnel know the status of facility equipment and systems.

This guidance shall include instructions for system alignments, locking of components, verification of technical specification compliance prior to plant operating-mode changes, authorization prior to removing or restoring equipment to service and identification and documentation of equipment deficiencies.

2.0 SCOPE

This chapter applies to individuals responsible for the system of administrative controls, procedures, and requirements for the control of equipment and system status.

It is imperative that equipment and systems in a DOE facility be properly controlled. Not only must the operating shift be aware of how equipment and systems will function for operational purposes, but in order to satisfy the design bases and the operational limits, the proper component, equipment, and system configurations must be established and maintained.

DOE facilities are required to establish administrative control programs to handle configuration changes resulting from maintenance, modifications, and testing activities. Typically, changes in equipment and system configuration are to be communicated from shift to shift through the shift turnover process or through an equivalent method of controlling status. Turnover checklists and equipment status boards are often used as aids for compiling and transmitting status information efficiently and accurately.

3.0 DEFINITIONS

None

4.0 RESPONSIBILITIES

4.1 SHIFT SUPERVISOR

Maintain proper configuration and authorize status changes to major equipment and systems.

5.0 PROCEDURE

5.1 STATUS CHANGE AUTHORIZATION AND REPORTING

The Shift Supervisor is responsible for maintaining proper facility configuration and shall be the only individual to authorize status changes to major equipment and systems. Since the supervisor is typically the senior operating person on shift, the supervisor is tasked with maintaining a broad overview of facility operations. The supervisor's perspective of status must necessarily be the focal point of shift operations.

Authorization to change the status of equipment and systems of lesser importance may be delegated by the Shift Supervisor to other cognizant operators. For example, radwaste operations may be assigned to a radwaste operator or to a foreman who authorizes changes in operating alignments or equipment configuration. The Shift Supervisor shall be advised periodically of changes in status of equipment and systems so assigned.

Since the operators must be aware of equipment and system status, the Shift Supervisor shall ensure that all changes in status of equipment are communicated to these persons. Typically, the control area operator is in the line-of-information flow to and from the supervisor.

Changes in the status of facility equipment and systems shall be reported to the governing stations (e.g., control area) or to the individual (or their relief) who authorized the change.

Typically changes in status of safety related equipment and systems shall be authorized by the supervisor and reported to the control area.

5.2 EQUIPMENT AND SYSTEMS ALIGNMENT

Individual components for system equipment shall be properly aligned prior to placing the equipment into operation. Alignment checks shall be performed after extended shutdowns, maintenance, or as defined by other procedures. An initial alignment of valves, switches, and breakers establishes a baseline configuration against which further operations may be measured. Once the equipment or system is properly aligned and is operating in accordance with operating procedures, frequent complete alignments of all individual components may not be necessary.

Prestart checklists (e.g., alignment checklist, valve lineup lists) shall be used to guide the operator in establishing the correct component positions.

CONTROL OF EQUIPMENT AND SYSTEM STATUS (U)

The prestart checklists shall include equipment nomenclature that matches the nomenclature placed on the component, a location for sign off of each check, the required alignment position for each component, and a location for noting deviations.

The Shift Supervisor shall review and approve completed prestart checklists.

The need for a complete alignment of equipment and systems should be based on the level of control that has been maintained over the status of the components. Typical situations that may require equipment and systems to be aligned include startup from cold shutdown, major outages, and mode changes. Following maintenance or other shutdown situations, safety related equipment shall be functionally tested, in accordance with the surveillance requirements of the Technical Specifications/Operational Safety Requirements, before the equipment or system is considered operable.

Records of equipment and system alignments shall be retained for reference by the operating shift per facility specific administrative procedures. Administrative controls that analyze and document deviations from the reference alignment should be established. Administrative control programs (e.g., tagout/lockout, temporary modification, etc.) are addressed in other chapters of this manual.

5.3 EQUIPMENT LOCKING

Locking devices shall be used on those components over which special administrative control must be established.

Locking devices provide some security that a component will be operated only by authorized facility personnel performing required evolutions in a controlled fashion. Additionally a locking device should alert the operator of the importance of the component and remind the operator that special controls over repositioning are to be maintained. In this respect, all personnel should receive training regarding their responsibilities concerning the manipulation of locked components.

The following administrative elements shall be established to define acceptable controls over locked components:

- A list of components that are required to be locked may be established and approved by the operations supervisor or appropriate manager. The list shall be separate from the standard alignment checklists.
- Criteria for locking of additional components and necessary authorizations should be provided.

CONTROL OF EQUIPMENT AND SYSTEM STATUS (U)

- When key operated locks are used, access to the keys should be readily available and restricted to authorized personnel.
- Specific techniques for verifying the position of locked components shall be established. A hands-on physical check of critical equipment or the observation of a reliable position indicator should be used whenever possible.
- When locked components must be unlocked or placed in a position other than the normal locked position, the deviation should be authorized and documented.
- Periodic checks of locked components shall be performed to ensure that locking devices are properly attached and that the component is in the required position.
- Lockout or Tagout shall be accomplished only by authorized qualified personnel.

All equipment which requires locking and tagging for the protection of personnel from injury, protect equipment from damage, and prevent the release of hazardous material to the environment during maintenance, inspections, tests and abnormal activities shall be locked and tagged in accordance with Chapter 9 - Lockouts and Tagouts.

5.4 OPERATIONAL LIMITS COMPLIANCE

Administrative controls shall be established to document compliance with requirements of operational limits (limiting conditions for operations).

The Shift Supervisor shall be cognizant of actions taken to comply with operational limits requirements and shall ensure that appropriate actions are taken to correct or mitigate any adverse consequences.

Logs, round sheets, turnover checklists, or other appropriate documentation shall reflect the initial facility conditions and actions that are taken in response to operational limits requirements.

Appropriate operating personnel shall be knowledgeable of operational limits and actions for which they are responsible.

Responsible personnel shall periodically review the operational limits and action statements for operations in effect to ensure that the required actions are met.

CONTROL OF EQUIPMENT AND SYSTEM STATUS (U)

5.5 EQUIPMENT DEFICIENCY IDENTIFICATION AND DOCUMENTATION

Equipment deficiencies shall be recorded by operations personnel and identified in the work control system for correction.

Methods that identify deficient equipment to operating personnel shall be established.

Equipment deficiencies shall be communicated to operations personnel responsible for monitoring equipment by the use of deficiency tags, logs, round sheets, or shift turnover checklists.

5.6 WORK AUTHORIZATION AND DOCUMENTATION

The Shift Supervisor or designee shall give written authorization, on the document controlling the work, for all shift activities on equipment important to safety, that affect operations, or that change control area indications or alarms.

Documentation of the status of work in progress shall be available in the control area for review. These activities could include such things as maintenance, test, fuel movement, radiography, and others.

5.7 EQUIPMENT POST-MAINTENANCE TESTING AND RETURN TO SERVICE

Equipment shall be tested following maintenance to demonstrate that it is capable of performing its intended function.

Testing of equipment following maintenance shall include performance of all functions that may have been affected by the maintenance.

Post-maintenance testing of equipment shall verify that the maintenance performed corrected the original problem and no new problems were introduced. If the original problem was not corrected or new problems were introduced, stop all testing and evaluate the situation.

Any post-maintenance testing shall be specified on the maintenance work order or accompanying documentation. If a test fails, maintenance work shall be re-evaluated and new work instructions issued to correct the problem or a revision to the test shall be made.

The Shift Supervisor shall ensure that testing appropriately proves equipment operability.

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5.8 ALARM STATUS

The status of control board or local panel alarms shall be readily available to operating personnel.

Information that shall be readily available to operating personnel includes alarms that are totally disabled, alarms with individual inputs disabled, alarms with temporarily changed setpoints, alarms that are normally lighted during operation, and multiple input alarms that do not reflash when more than one input is activated.

Appropriate actions shall be taken to monitor equipment parameters for abnormal conditions that would be masked by deficient or non-reflashing alarms.

Color-coding of alarm windows or the use of deficiency stickers may be useful in enhancing operator awareness of these status considerations.

5.9 TEMPORARY MODIFICATION CONTROL

An administrative control system shall be established for installation of temporary modifications such as electrical jumpers, lifted leads, pulled circuit boards, disabled annunciators/alarms, mechanical jumpers/bypasses, temporary setpoint changes, installed or removed blank flanges, disabled relief or safety valves, installed or removed filters or strainers, plugged floor drains, and temporary pipe supports.

Prior to modification, the administrative control system shall ensure the temporary modifications are approved by design authority to allow for technical oversight and an evaluation of the impact on current design activities, and approval of the design modification.

Administrative control systems shall make provisions for safety reviews, installation approval, independent verification of correct installation and removal, documentation of the modification, update of operating procedures and documents, training, marking of installed modifications, and periodic audits of outstanding modifications.

5.9.1 Temporary Modification, Lifted Lead, Blocking, Jumper Control

A log of all temporary modifications including electrical jumpers, lifted leads (and papering relay contacts so they do not close), pulled circuit boards, disabled annunciators/alarms, mechanical jumpers/ bypasses, temporary setpoint changes, installed or removed blank flanges, disabled relief or safety valves, installed or removed filters or strainers, plugged floor drains, and temporary pipe supports must be in the control area. This log is

to be used by the operating personnel to maintain configuration control and system status. This log and the alterations should be audited weekly. "Red lined Drawings" of these alterations should be in the Control Area. The intent of these controls is to aid the operator in maintaining and knowing the configuration of the systems.

Independent verification and unique identification is required when electrical jumpers, lifted leads, pulled circuit boards, disabled annunciators/alarms, mechanical jumpers/ bypasses, temporary setpoint changes, installed or removed blank flanges, disabled relief or safety valves, installed or removed filters or strainers, plugged floor drains and similar modifications or alterations are involved (See Chapter 10).

The same technical rigor applied to a permanent change is to be used for temporary modifications.

5.10 Distribution and Control of Equipment and System Documents

A system shall be established to ensure that operations personnel receive and utilize the latest revisions of engineering drawings and specifications. Operations personnel shall be made aware of all changes to these documents.

The document distribution shall include all operations related activities such as procedures review groups, maintenance groups, facility safety analysis groups, and testing groups.

6.0 REFERENCES

1. DOE Order 5480.19, Conduct of Operations Requirements for DOE Facilities.

7.0 ATTACHMENTS

None

WESTINGHOUSE CONDUCT OF
OPERATIONS MANUAL

Manual
Chapter
Page
Effective Date

WHC-SP-0708
8, Rev 1
8 of 8
January 1, 1994

CONTROL OF EQUIPMENT AND SYSTEM STATUS (U)

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LOCKOUTS AND TAGOUTS (U)

1.0 PURPOSE

The purpose of this chapter is to provide a method for equipment status control through component Tagging or Locking which shall protect personnel from injury, protect equipment from damage, maintain operability of facility systems, and maintain the integrity of the physical boundaries of facility systems.

If there is a potential for equipment damage or injury during equipment operation, servicing, maintenance, or modification activities due to inadvertent activation of equipment, a facility Lockout/Tagout program should be established and used. The Lockout/Tagout program should provide for independent verification of the removal from service and the restoration to service of safety-related and other facility equipment. This chapter describes the important elements of a Lockout/Tagout Program and is intended to meet the requirements of 29 CFR 1910.

2.0 SCOPE

A Tagout program includes the placement of a Tagout device on an energy-isolating device, in accordance with an established procedure, to indicate that the energy-operating device and the equipment being controlled may not be operated until the Tagout device is removed.

Similarly, a Lockout program includes the placement of a Lockout device (e.g., a lock, or hasp with a lock in place) on an energy-isolating device in accordance with an established procedure ensuring that the energy-isolating device and the equipment being controlled cannot be operated until the Lockout device is removed.

An effective Lockout/Tagout program should be developed by each facility and should include detailed administrative procedures, training of personnel, and uniquely identifiable tags. The program should also exercise appropriate control over Lockout/Tagout preparation, approval, placement, and removal; provide for adequate documentation; and be consistent with the requirements of 29 CFR 1910.

3.0 DEFINITIONS

LOCKOUT - the application of a lock on a control to render the control inoperative. Other devices (such as wiring a control inoperative, installation of a control defeating device) also may constitute a lesser degree of lockout.

TAGOUT - the application of a danger or caution tag on the control that indicates that the control is not to be used except under conditions indicated by the tag.

QUALIFIED PERSONNEL - a person who has been trained in performing duties of lockout and tagout.

AFFECTED PERSONNEL - an employee whose job requires the use of a machine or equipment on which maintenance is being performed under a tagout/lockout or whose job requires working in an area in which maintenance is being performed.

4.0 RESPONSIBILITIES

4.1 SHIFT SUPERVISOR

Shift Supervisor shall assure that required lockouts and tagouts for their area of responsibility are prepared, installed and controlled in strict adherence with facility procedures.

4.2 ALL PERSONNEL

All Personnel shall adhere to the requirements of the lockout and tagout procedures.

5.0 PROCEDURE

5.1 LOCKOUT AND TAGOUT USE

Locks and tags shall be placed on controls for safety or other special administrative reasons.

Locks may be built into a switch or may be external locks (e.g., padlock) that are affixed or removed when necessary.

Keys and combinations for locks shall be controlled. Tags shall be placed on, or as close as possible to, the control that is tagged out.

5.2 LOCKOUT AND TAGOUT IMPLEMENTATION

If a device has the capability of being locked out, locks shall be used.

If the isolating device cannot be locked out, the device shall be tagged out and an alternate method of locking out the isolating device shall be implemented.

New equipment design and major modifications to existing equipment should be designed to provide the capability of being locked out.

Experience has shown that the use of miniature tags have proven to be beneficial where circumstances warrant. Miniature tags are tagout devices that are smaller in size than full size tags yet serve the same function as full size tags. Miniature tags shall be used on control panels or other areas that have closely spaced control switches and indicators and/or pushbutton type control switches where attachment of a full sized tag may obscure switches, indicators, controls, or identification labels.

5.3 PROTECTIVE MATERIALS AND HARDWARE

Locks, tags, chains, wedges, key blocks, adapter pins, self-locking fasteners, or other hardware should be provided for isolating, securing, or blocking machines or equipment from energy sources.

Lockout and tagout devices shall be singularly identified as the only devices used for controlling energy and shall not be used for other purposes.

Lockout and tagout devices shall meet the following requirements:

- **Durable** - Lockout and tagout devices shall be capable of withstanding the environment to which the device will be exposed considering time, weather conditions and chemical environment.
- **Standardized** - Lockout and tagout devices shall be standardized within the facility. Features to be considered are color, shape, size, standard print, and format.
- **Substantial** - Lockout devices should be substantial to prevent removal, without the use of excessive force or unusual techniques, such as the use of bolt cutters or other metal cutting tools.

When used as the sole means of preventing operations of an energy isolating device, tagout devices, including their means of attachment shall, in addition to other requirements for their use, be of a non-reusable type, attachable by hand, self-locking, and nonreleasable with a minimum unlocking strength of no less than fifty pounds and having the general design and basic characteristics at least equivalent to a one piece, all-environment-tolerant nylon cable tie.

Tagout device attachment means should be of a non-reusable type attachable by hand, self locking, and non-releasable.

- **Identifiable** - Tagout and lockout devices shall indicate the identity of the personnel and the organization applying the device.
- **Warning** - Tagout devices should warn against hazardous conditions if the machine or equipment is energized and should include the legend DO NOT OPERATE.

LOCKOUTS AND TAGOUTS (U)

5.4 LOCKOUT AND TAGOUT PROGRAM

A lockout and tagout program should be established consisting of procedures to control potentially hazardous energy and materials and personnel training. This program should ensure that potentially hazardous energy or toxic material sources are isolated and rendered inoperative during servicing or maintenance or in any case where unexpected energizing, startup, or release of stored energy or toxic material can cause injury.

5.5 PROCEDURES FOR LOCKOUT AND TAGOUT

Procedures should be developed, documented, validated, and utilized for control of potentially hazardous energy or material. Procedures should clearly and specifically state the scope, purpose, authorization, rules, and techniques of the Lockout/Tagout program. Procedures should include, but not be limited to, the following:

- Specific statement of intent of use.
- Specific procedural steps for isolation, blocking and securing machines or equipment for hazardous energy or material.
- Specific procedural steps for the placement, removal, and transfer of the Lockout/Tagout devices(s).
- Specific requirements to test machines and to determine and verify the effectiveness of Lockout/Tagout or other control measures.

It is not necessary to document the steps for lockout and tagout of a particular machine or equipment, when all of the following elements exist:

- The machine or equipment has no potential for stored or residual energy or reaccumulation of stored energy after shutdown, which could endanger personnel.
- The machine or equipment has a single energy source which can be readily identified and isolated.
- The isolation and locking out of that energy source will completely deenergize and deactivate the machine or equipment.
- The machine or equipment is isolated from an energy source and locked out during servicing or maintenance.
- A single lockout device will achieve a locked out condition.
- The lockout device is under the exclusive control of the authorized personnel performing servicing or maintenance.

- The servicing or maintenance does not create hazards to other personnel.
- The facility, using the exception, has had no accidents involving the unexpected activation or reenergization of the machine or equipment during servicing or maintenance.

5.6 DOCUMENTATION OF LOCKOUT AND TAGOUT

Lockout/tagout placement, activation, and removal shall be recorded, including any information relevant to their occurrence. This record shall be maintained by the Shift Supervisor to ensure accuracy and completeness. Personnel shall review the changes to the lockout and tagout record each shift as part of the shift turnover process (Chapter 12).

5.7 APPLICATION OF LOCKOUT AND TAGOUT

The established procedure for the application of implementing lockout and tagout shall satisfy the elements of 5.2 and the following actions in sequence:

5.7.1 Preparations for Shutdown

Before a machine or equipment is turned off, personnel should be informed of the type and magnitude of the energy, the hazards and the methods of control.

5.7.2 Machine or Equipment Shutdown

The machine or equipment shall be shut down using approved procedures. An orderly shutdown shall be used to avoid any added hazard.

5.7.3 Equipment Isolation

All lockout and tagout devices needed for control are physically located and operated in such a manner as to isolate the equipment from the energy source.

5.7.4 Affixing Lock/Tags

Lockout or tagout devices shall be affixed to each isolation device by authorized qualified personnel in a manner that will hold the devices in a "safe" or "off" position, or clearly indicate that operation of the device is prohibited.

LOCKOUTS AND TAGOUTS (U)

5.7.5 Stored Energy

On application of lockout or tagout devices, all potentially hazardous stored or residual energy should be relieved, disconnected, restrained, or otherwise rendered safe. If stored energy might reaccumulate to a hazardous level, verification of isolation should be continued until the servicing or maintenance is completed.

5.7.6 Verification of Installation

Before starting work on equipment that has been locked or tagged out, personnel shall verify that isolation and deenergization have been accomplished.

5.7.7 Release from Lockout/Tagout

Before lockout or tagout devices are removed and energy restored to the equipment, procedures should be followed to ensure the following:

- **Equipment/Workspace** - The machine or equipment is operationally intact. The area has been inspected to ensure that nonessential items have been removed. Per the approved procedure, if applicable, the individual authorizing tag removal has specified the final component position and, when appropriate, the sequence in which components should be positioned. In addition, the need to check the positioning of other components that were not locked or tagged, but are related to the operations of the lockout and tagout component, should be determined at this time and appropriate instructions should be developed. When necessary, check the position of other components to ensure that components within the lockout/tagout boundaries are correctly aligned to support operation.
- **Personnel** - The workspace shall be checked to ensure that all personnel have been positioned safely or removed from the area. Before lockout and tagout devices are removed and equipment energized, affected personnel should be notified before equipment is re-energized.
- **Lockout/Tagout Device Removal** - Each lockout and tagout device shall be removed from each energy-isolating device by an authorized qualified individual. The individual shall reposition the components in the sequence specified and check the positioning as necessary. The removal of locks or tags shall be documented. Tags shall be returned to the Shift Supervisor. The Shift Supervisor

shall be satisfied that all tags and safety devices associated with the lockout and tagout area are accounted for after removal and destroy the tags.

When the person who applied the Lockout/Tagout device is not available to remove it, that device may be removed under the direction of the appropriate supervisor/manager, provided that specific procedures and training for such removal have been developed and incorporated into the facility program. The supervisor should demonstrate that the specific procedure provides equivalent safety to the removal of the device by the authorized personnel who applied it. The specific procedure should include the following elements:

- Verification by the supervisor/manager that the person who applied the device is not available.
- Assurance that all reasonable efforts are made to inform the person that the device has been removed.
- Ensuring that all relevant personnel have this knowledge before they resume work at the facility.

5.7.8 Lineup Verification

Independent verification of systems or component alignment should be performed and documented following removal of tags on safety-related and other important systems. Chapter 10, Independent Verification contains additional guidelines on this subject.

5.8 TESTING OR POSITIONING OF EQUIPMENT

Temporary removal of lockout and tagout devices shall be discouraged. However, situations in which lockout and tagout devices must be temporarily removed and the equipment energized, the following sequence of operations shall be followed:

5.8.1 Removal must be approved by supervisor

5.8.2 Clear the equipment of tools and materials

5.8.3 Remove personnel from the equipment area

5.8.4 Remove the lockout and tagout device as directed by procedure

5.8.5 Energize and proceed with testing or positioning

5.8.6 Deenergize all systems and reinstall a lockout and tagout

This Lockout/Tagout shall be controlled and documented with the same rigor as used in the original Lock/Tagout.

5.9 PERIODIC INSPECTIONS

Inspections shall be conducted monthly by authorized qualified personnel to determine adherence to procedures and to correct any deviations or inadequacies observed. Inspections shall include a review of the responsibilities of all personnel.

The Shift Supervisor shall certify that the periodic inspections have been performed, documenting the equipment and procedures involved, dates of inspection, personnel participating in the inspections, and personnel performing the inspections.

5.10 CAUTION TAGS

The use of CAUTION TAGS shall be restricted to those situations in which a component or system is functional, but when some precaution or item of information is necessary before operation.

CAUTION TAGS shall not be used for personnel protection (i.e., CAUTION TAGS shall not be used where it is appropriate to use a lockout and tagout device) or in lieu of Operating Procedures or Timely Orders (i.e., Shift Orders, Standing Orders, etc.).

Administration of CAUTION TAGS could, however, be accomplished as part of the lockout and tagout program or it could be covered separately. In addition, the program shall include the following elements:

- CAUTION TAGS shall be uniquely identifiable and different in appearance from other facility tags. The following information shall be included on the tags as an aid in administering the program:
 - CAUTION TAG number
 - Component name and number
 - Effective date
 - Precaution or information applicable to the particular situation and/or component or system.
 - Signature of authorizing individual and organization.

- Situations that require special operator or maintenance precautions or amplifying information shall be brought to the attention of the operations supervisor or appropriate manager. The Shift Supervisor shall ensure that issuing a CAUTION TAG is necessary and that the tag is not being used in place of more appropriate administrative action (such as a temporary procedure change, operator aid, use of the work control system, or issuance of a safety lockout or tagout). The Shift Supervisor review shall also ensure that any instruction contained in the CAUTION TAG does not deviate from established facility procedures, Technical Specifications, or Operational Safety Requirements.
- A record of all active CAUTION TAGS and associated amplifying information shall be available to the appropriate personnel. This record and associated tags shall be reviewed monthly by authorized qualified personnel.
- The record review shall verify the continued need and applicability for each CAUTION TAG and ensure that the CAUTION TAG index accurately reflects all active CAUTION TAGS. This review shall be documented. Any CAUTION TAGS remaining in an active status for extended periods (e.g., longer than three months, or as appropriate) shall be brought to the attention of the Shift Supervisor. The Shift Supervisor shall determine what action is needed to resolve the continued use of the CAUTION TAG.
- CAUTION TAG placement - CAUTION TAGS shall be placed in such a way that they do not interfere with or obscure indications, switches, or other control devices but are readily apparent to an individual before the operation of the tagged device. Placement of CAUTION TAGS shall be documented.

5.11 TRAINING AND COMMUNICATION

Training shall be provided and documented to ensure that the purpose and function of the lockout and tagout program is understood by all personnel and that the personnel have the knowledge and skills required for safe application, use, and removal of lockouts and tagouts. Training shall include the following elements:

- Recognition of applicable hazardous energy sources, type and magnitude of energy or materials involved, and methods to isolate and control.
- Personnel involved shall be instructed in the purpose and use of the lockout and tagout procedures.

- All personnel who may enter the area shall be trained to recognize the lockout and tagout and to understand the procedure and prohibition relating to attempts to restart or reenergize machines or equipment.
- When tagout systems are used, personnel shall be trained in the limitations of tags. The following are tag limitations:
 - Tags are essentially warning devices and do not provide physical restraint on those devices; as are provided by a lock.
 - When a tag is attached, it is not to be removed without authorization of the Shift Supervisor. The tag shall not be bypassed, ignored, or otherwise defeated.
 - Tags shall be legible and understandable by all personnel.
 - Tags and their means of attachment shall be able to withstand the environmental conditions encountered in the workplace.
 - Tags may evoke a false sense of security and their meaning needs to be understood.
 - Tags must be securely attached so the tag cannot be inadvertently or accidentally detached during use.
- When lockout systems are used, personnel shall be trained in the limitation of locks. The following are lock limitations:
 - Operations of the facility may be hindered (this is significant when local component operations are necessary, such as remote shut down or remote control).
 - Locks and chains installed on small instrument line isolation valves can contribute to seismic loading and may not have been considered during safety analysis.

Retraining shall be provided for all authorized or affected personnel whenever there is a change in job, procedures, machines, equipment or processes that present new hazards or when periodic inspection determines training is needed.

5.12 NOTIFICATION OF PERSONNEL

The Shift Supervisor shall notify affected personnel of the application and removal of lockout/tagout devices. Notification should be given before the devices are applied and after they are removed.

5.13 SUBCONTRACTORS

Whenever subcontractor servicing personnel are to be engaged in activities covered by the scope of the lockout and tagout program, the facility representative and the subcontractor shall inform each other of their respective lockout and tagout procedures and ensure their personnel are aware of the changes.

5.14 GROUP LOCKOUTS AND TAGOUTS

When servicing or maintenance is performed by a crew, craft, department, or other group, they should use a procedure that will provide for equivalent safety provided by the personal lockout or tagout device.

5.15 SHIFT OR PERSONNEL CHANGES

Specific procedure control shall be used during shift or personnel changes to ensure the continuity of lockout or tagout protection, including a provision for the orderly transfer of lockout or tagout devices between personnel or shifts.

6.0 REFERENCES

1. DOE Order 5480.19, Conduct of Operations Requirements for DOE Facilities.

7.0 ATTACHMENTS

None

WESTINGHOUSE CONDUCT OF
OPERATIONS MANUAL

LOCKOUTS AND TAGOUTS (U)

Manual
Chapter
Page
Effective Date

WHC-SP-0708
9, Rev 1
12 of 12
January 1, 1994

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INDEPENDENT VERIFICATION (U)

1.0 PURPOSE

This chapter identifies a system for independent verification of the correct positioning of components which are considered critical to the safety of operation of the process, system or facility. An independent verification program should provide a high degree of reliability in ensuring the correct facility operation and the correct position of components such as valves, switches, and circuit breakers.

2.0 SCOPE

Independent verification shall be performed in those cases where a reasonable potential exists for component mispositioning or the consequence of error is great. The application of the program is dependent upon the safety and operations considerations of each process, system or facility. A comprehensive independent verification program will identify components to be included in the program, define when independent verification is required, and prescribe the methods of performing independent verification. Similarly, independent auditing of operations should confirm that established operational requirements are met.

Because the possibility of mispositioning may be quite remote, or because the effect of a mispositioning may not be significant to safe and reliable operation, not all components require independent verification. Therefore, it is important to identify those components that must be independently verified. Designating systems or components that require independent verification ensures the program will be consistently applied.

Definition of when independent verification is required will also help ensure consistent application of the program. The criteria should ensure that independent verification is performed in all cases where a reasonable potential exists for component mispositioning.

Independent Verification recognize the human element of component operation; that is, any operator, no matter how proficient, can make a mistake. This concept should be stressed in an independent verification program so that the operators' confidence in the ability of their peers will not cause a relaxation of attentiveness with respect to verification tasks. Operators should understand the importance of the independent verification program and address this task with a high level of personal integrity and discipline.

3.0 DEFINITIONS

INDEPENDENT VERIFICATION - the act of checking by a qualified operator at a separate occasion that a given operation conforms to established operational criteria, as well as checking a component position, independently of activities related to establishing the component's position.

4.0 RESPONSIBILITIES

4.1 FACILITY MANAGER

The facility manager shall:

- Establish the Independent Verification Program including independent verification techniques training requirements for operations personnel.
- Ensure all managers under the authority of the Facility Manager are thoroughly familiar with independent verification practices and requirements.
- Designate those systems and/or components requiring independent verification.

4.2 SHIFT SUPERVISOR

The shift supervisor shall:

- Ensure only qualified personnel perform independent verification.
- Determine the corrective actions to be taken when discrepancies are discovered.
- Obtain approval to authorize deviations from normal verification practices

4.3 OPERATIONS PERSONNEL

The operations personnel shall:

- Adhere to the requirements of this procedure.

4.4 INDEPENDENT VERIFIER

The independent verifier shall:

- Be responsible for the actual identification of the component and determination of both its required position and the actual position. The position of the component shall not be changed by the independent verifier. All acts of verification including locating the component, reading the label and performing all steps independently (avoid common mode error) are required.

5.0 PROCEDURE

5.1 COMPONENTS REQUIRING INDEPENDENT VERIFICATION

Components that are critical to ensuring safe and reliable operation shall receive an independent verification of their positions by a qualified operator. These components shall be identified explicitly in facility procedures or other official documents so that unnecessary interpretation of requirements will be minimized. In addition, this will result in uniform practices by operations personnel. Because mispositioning of certain components that are not safety related can lead to facility shutdowns, challenges to safety-related equipment, or other undesirable effects on facility safety and reliability, independent verification should not be limited to safety-related system components. Each facility should use an accepted safety analysis method (e.g., fault-tree analysis, Probability Risk Analysis) and or expert opinion to determine its own facility specific list of systems and components, which should receive independent verification in accordance with the following guidelines

5.2 SAFETY RELATED SYSTEMS

Components in safety related systems shall require independent verification. Some components may not need independent verification if any of the following criteria have been met:

Mispositioning would not affect system performance. For example, if an engineering analysis has shown that mispositioned vent or drain valves do not affect system performance, they might not require independent verification.

The mispositioning would be known immediately to an operator. For example, resetting a steam-supply trip valve might not require independent verification if an annunciator alarm in the control room were available to alert operators to an improperly reset valve. However, such annunciator alarms should be independent from the valve position lights associated with main control board valve operation switches. Valve position lights alone should not warrant exemption from independent verification requirements, because these lights might not alert operators to a mispositioned valve. Mispositionings have occurred when main control board indication was available.

Significant radiation exposure would be received by the individual performing the independent verification. In this case, alternate means for independent verification that do not involve radiation exposure, such as observing process parameters should be considered. Variances from independent verification requirements in accordance with the above criteria should be approved by the operations supervisor.

5.3 SYSTEMS NOT RELATED TO SAFETY

Independent verification shall be performed for certain non safety related components that, if mispositioned, could lead to unplanned shutdowns, challenges to safety systems, or inadvertent radioactive or toxic material release. For example, component positions necessary to support the operation of important facility equipment, such as redundant generator stator cooling water pumps or turbine control oil (EHC) pumps, should be independently verified in order to prevent unnecessary process shutdowns. Also, certain valve positions in liquid or gaseous radioactive waste systems should be independently verified if a mispositioning could lead to an unintended radioactive or toxic material release.

5.4 OCCASIONS REQUIRING INDEPENDENT VERIFICATION

Components shall receive independent verification when the equipment they serve must be available and a reasonable possibility exists that the components may have been mispositioned. The following steps describe situations where independent verification would be appropriate:

5.4.1 Returning equipment to service following maintenance or testing

Independent verifications shall be performed to ensure that systems are properly aligned when equipment is returned to service. After maintenance activities, it is appropriate to verify independently the positions of components that have been tagged to establish an isolation boundary for the work. Also, additional components that could have been mispositioned during maintenance should be selected for verification on a case-by-case basis by the individual authorizing equipment for return to service.

Such additional items requiring verification would include any component(s) that had been worked on and might also include instrument stop valves, bypass valves, switches, and isolation valves located within the work boundary.

Failure to properly restore systems following surveillance testing has resulted in mispositionings. Selected components should therefore be independently verified during or after surveillance tests. Surveillance tests are normally performed in strict adherence to detailed procedures that specifically address each operating component. Components not addressed by the test procedure would not be likely to be mispositioned as a result of tests, and independent verification would be necessary only for components that had been positioned during tests.

INDEPENDENT VERIFICATION (U)

5.4.2 Removing equipment from service

To ensure that only specific items of equipment intended to be removed from service are affected by Tagouts, independent verifications shall be performed when equipment is removed from service. For example, when tagging out a pump, a verification that the redundant pump was not inadvertently affected should be performed. This might be done by checking for correct alignment of components on the redundant equipment, or this might be done by verifying that all Tags were placed on the correct components.

5.4.3 System lineups

During extended shutdowns, it is often impractical to completely restore systems to their normal operating alignment immediately after maintenance is completed. Therefore, most facilities delay restoration of systems not needed for shutdown activities until shortly before startup. At that time, all systems whose status is questionable are checked. When system lineups are performed, the considerations of Step 5.1.1, Components Requiring Independent Verification, should be applied to determine the need for independent verification.

5.4.4 Periodic checks during facility operation

In order to verify that all associated equipment is fully functional, DOE Facilities should perform routine, periodic verifications of certain critical components during normal operations. Since this check is independent from any activity that might have caused a component to be mispositioned, it can be considered an independent verification; a second check normally would not be necessary. However, if a mispositioning were discovered while the periodic check was being performed, the component position would then be corrected after review and/or approval by a qualified supervisor; an independent verification of this action would be appropriate.

5.5 VERIFICATION TECHNIQUES

The Facility Manager shall determine the method of independent verification for each component and the procedure (including component listing, method of verification and requirements for documentation) for documentation of each independent verification. Operators shall be trained in the appropriate techniques for verifying the positions of all facility components. In addition, a reference document should be provided explaining what an operator should do when verifying a component position. Because of the large variety of components in use in DOE facilities, it is not feasible to provide specific instructions for verification of individual component positions without facility-specific knowledge. Each facility should use its most experienced personnel to develop these instructions, using applicable manufacturer's

INDEPENDENT VERIFICATION (U)

recommendations where available. The instructions should describe the techniques for verifying manual valves, motor- and air-operated valves, solenoid-operated valves, circuit breakers, blank flanges, removable links and fuses, and the availability of control power. Specific detailed techniques for common operating equipment is provided in Attachment A. These instructions will help to ensure that operators use approved methods when verifying component positions and will help provide uniformity in operator performance.

5.5.1 Independence

- Independent verification shall be conducted separately in a manner such that each check constitutes a local identification of the component and a determination of both its required and actual positions.
- To be independent, the integrity of the checks must be maintained by minimizing interaction between the personnel operating components and those performing the independent verifications. It is not always possible to determine if an operator has completely shut or opened a valve by merely observing the action; mistakes in component identification or requirement determination might not be caught without both individuals' reading the labels and procedures.

5.5.2 Guidelines for Performing Independent Verification

There must be no doubt as to the determination of the actual position of a component. Determining the actual position (e.g., open, shut, throttled, test position, or racked out) of the component is based upon experience, training, and if needed, vendor information for specific devices encountered. Engineering should be consulted any time technical help is needed. Operators shall contact shift management to resolve any uncertainty.

If a discrepancy is discovered while independently verifying a condition, the individual discovering the discrepancy shall clearly indicate the discrepancy by circling it in red on the procedure or checksheet and then notifying shift management. Do not sign the step.

Under normal circumstances, the individual conducting independent verification shall not accompany the individual performing the initial work. The term independent includes conducting the verification at a different time and separately from the actual work.

When independent verification of component/condition is required and special circumstances require the two individuals performing the task to work together (i.e., "Buddy System" in hazardous areas), the act of performing the independent verification must be completely separate and independent of the

INDEPENDENT VERIFICATION (U)

initial alignment, installation, or verification. The individual performing the independent verification must not rely upon the observed actions of the individual performing the initial alignment, installation, or verification to determine the correct component identification, position, or condition. Verifier independence must be maintained to ensure the integrity of the independent verification by minimizing interactions between individuals. Actual physical separation is not required, but is recommended to avoid errors.

Independent verifications should be conducted in a manner such that each check constitutes an actual identification of the component and determination of both its required and actual positions.

Particular attention must be paid by the operator to the type of valve to be verified. Some of the individual techniques may not be appropriate for a particular type, make, or model of valve due to the physical construction of the valve.

Observation of the relative height of a valve stem shall not be used as the sole determinant of a valve's position.

Position indicators are subject to equipment failures that could result in display of the incorrect status of a valve or breaker. If remote position indicators are utilized, personnel should use different remote indicators, if available. The use of remote position indicators is acceptable for both verifications when surveillance testing proves the remote indicators are accurate. However, if possible, one check should be performed locally at the component to avoid common failure problems.

If remote position indication is being used to verify the position of one or more valves, the position will be verified prior to de-energizing the control power or motor power due to the possible loss of remote position indication when de-energized.

Care must be exercised when using process parameters as a second check of a component's position due to possible alternate flow paths, or other conditions that could make this method unreliable.

Some throttled valves and ventilation dampers in plant system have been positioned during system flow balance testing and control critical system operating parameters. These valves and dampers are not to be manipulated, but may be visually verified that the valve or damper is in the throttled position.

Valve line-up checklists for all locked throttle valves and dampers will be completed by ensuring the locking device is properly installed, and the valve is in its required position.

When the operation of a throttled valve is necessary to determine its position, the Independent Verifier may observe the initial valve operator's actions. Repositioning the valve for independent verification would effectively nullify the first, and would therefore serve no purpose.

If the actual position of a component cannot be verified due to unfamiliarity with the device, the Independent Verifier must seek assistance from more Senior Shift personnel to resolve the uncertainty.

Independent verification may be waived by the Shift Manager if excessive radiation exposures would result.

The actual situations should be determined on a case-by-case basis by Shift Management for those components not previously exempted on the system procedure or checklist. In these situations, an alternate means of independent verification that does not involve radiation exposure (such as observing process parameters) should be considered.

5.5.3 Verification Activities (The Meaning of Signatures/Initials)

Verification of activities and the value placed on signatures is extremely important in helping to eliminate error and achieve excellence.

5.5.3.1 The Meaning of a Signature for an Activity. Because humans can make errors, the requirement to have individuals to sign for an action is intended to focus their attention, and gain their personal assurance that there is accuracy and accountability in what has been done and signed for.

There have been instances where valves, switches, tags, locks, jumpers, lifted leads were inaccurately verified. Actions required in one storage tank or process line were believed to be performed and even signed off but were completed in the wrong tank or line or not done at all. Other activities requiring verification and even second independent verification resulted in the action being inaccurate.

An individual who signs must know what he/she is committing to. The signature on an action means "I have done the action required and it is correct and meets the requirements, I guarantee it, I put my reputation and maybe my or someones life on the line, it is correct, I said it was so, I stand behind it, this is me, my product I put my stamp of approval on this, identify me with the success or failure, I have ownership". A sign-off must be taken very seriously.

When an individual signs a drawing, check list or a procedure step as a performer or independent verifier or a second party verifier, they place their reputation on a document. A signature represents a commitment that the issue

at hand is correct and accurate - no more or no less. It indicates that every thing in the signers power to ensure that the appropriate action was taken has been done. If for some reason an individual lacks confidence in their ability, knowledge, or understanding of the procedure they should not sign their name. They should notify their supervisor or the appropriate individual and state their concern.

Signatures for an action are very important, they must be used when really necessary and not diluted in meaning by requiring a signature for insignificant items. If an activity has been signed off inappropriately, the consequences can not be treated lightly. Disciplinary action may be appropriate because of the importance attached to a "signed off activity". Personnel who make sign offs must understand what they are signing for and the meaning of their signature.

5.5.3.2 Self Verification - (How to help ourselves be accurate.) Self verification, "Thinking before acting", being thoughtful, deliberate, being sure of what one is about to do. Knowing what to expect will minimize chances for making errors.

Seven basic steps have been identified to help in self verification, they are:

- **Stop** - Stop to think, organize, and prepare before beginning the task.
- **Locate** - Locate all materials, tools, information, people, and other requirements need for the job. Be sure the component to be worked on is correctly identified (for instance, match and verify the work document numbers with the equipment identification).
- **Sense** - Use the senses - hearing, seeing, smelling, touching, intuition - while performing on-the job tasks. Use whatever sense is appropriate for assessing the situation and performing the job safely and effectively.
- **Verify** - Verify instructions, locations of equipment, numbers, time limits, and all aspects of the task before it is performed. Get the answers to any questions or concerns.
- **Anticipate** - Anticipate what will happen when the task is being done. What is the expected outcome? What else will be effected?
- **Perform** - When steps 1 through 5 above have been satisfied, perform the task carefully, safely, and efficiently.
- **Observe** - Observe to see if what was expected to happen did, in fact, happen. Be alert for unexpected responses.

5.5.4 Independent Verification of Tagout/Lockout

Upon completion of a lockout/tagout or removal of a system or equipment requiring independent verification, the supervisor will assign a qualified person to perform independent verification.

Shift management may direct not to independently verify a permit removal if the affected positions components are subsequently to be independently verified using a check-off-list. However, all the components listed on the lockout/tagout must be listed on the check-off-list.

Independent Verifiers shall review the tagout/lockout to ensure that they are qualified to perform the independent verification. Independent Verifiers shall then perform the independent verification by performing the following steps:

- Verify each detail of tagout/lockout by personal observation of the document and equipment and tags/locks.
- Return the documents to the supervisor.
- If a discrepancy is observed between the required and actual positions of a component as designated on a document, the independent verifier will immediately notify the shift management.

5.5.5 Suggested Method for Independent Verification Using Checkoff Lists (COLs)

If the Facility Manager or Shift Supervisor determines that a portion or portions of a COL encompass the detail of lineup of the particular component, subsystem, or system, the manager or supervisor will mark up two copies of the applicable COL to indicate the particular components to be verified. The Shift Manager or Shift Supervisor will then sign and date the first page of each of the two marked COLs.

One copy of the COL will be given to a qualified operator, who will verify by initialing and dating each step that each component listed on the complete COL or identified on the marked-up COL is in the position or condition shown on the COL. The operator will sign the COL to signify that the components have been verified to be in the position or condition shown on the COL.

The second copy of the COL will be given to the independent verifier, who will independently verify that each component listed on the complete COL or identified on the marked-up COL is in the position or condition shown on the COL. The independent verifier will initial and date each step on the second COL to signify that the components have been verified to be in the position or condition shown on the COL.

INDEPENDENT VERIFICATION (U)

If the component is not in the required position, the independent verifier shall not initial and date that step nor reposition the component. Rather, the step will be circled in red or flagged such that the non-conformance is brought to the attention of shift management.

If the independent verifier discovers a Do Not Operate or Caution tag on a component while verifying a COL, the step shall not be initialed and dated. Rather, the tagout/lockout document number on the tag will be noted at the bottom of the COL for the specific steps in the COL and the supervisor will resolve the issue.

5.5.6 Independent Verification Using COLs

Shift management will check the COLs for conformance. If each independently verified position or condition indicated by the verifiers is the same as the position or condition listed on the COL, the item is in conformance. If a position or condition does not match the required position, shift management shall take action to resolve the discrepancy.

5.6 REMOTE POSITION INDICATORS

- Some equipment failures have caused valve position indicating lights on the main control board to be incorrect, and some of these failures were undetected for a significant length of time. Since the failure may be in the sensor or transmission, independent verification may be performed at a remote position indicator if environmental or safety concerns preclude local verification.

5.7 PROCESS PARAMETERS

- In some situations, a component position can be determined by observing process parameters such as pressure, flow, or voltage. The observation of process parameters, combined with a physical check of a component's position, can constitute an independent verification.
- Care must be exercised when using process parameters because alternate flow paths or other factors could cause them to be misleading indicators of component position. For example, voltage on a bus would prove that a particular supply breaker was shut only when there was no alternate power supply. Additionally, flow and pressure do not necessarily indicate that a valve is fully open. For the above reasons, process parameters normally should not be used as the only indication of a component's position. Facility procedures should specify where and when process parameters are acceptable indicators of component position.

5.8 Surveillance Testing

- In some cases surveillance testing may be substituted for normal verification techniques. A notable example would be a full-flow test to prove the correct positioning of flow controlling P-valves. However, surveillance tests frequently will not serve to verify the position of all components that are important to subsequent system's operation. For example, running a pump in recirculation would not prove that all main flow-path valves were properly positioned or that support functions such as external cooling or backup oil pumps are aligned properly.
- Surveillance testing cannot be used as independent verification unless it can be shown that the test conclusively proves the position of the components in question. The applicability of surveillance testing to satisfy independent verification requirements shall be approved by the Facility Manager prior to performance of the test .

6.0 REFERENCES

1. DOE Order 5480.19, Conduct of Operations Requirements for DOE Facilities.

7.0 ATTACHMENTS

Attachment A Independent Verification Techniques

ATTACHMENT A

INDEPENDENT VERIFICATION TECHNIQUES

This attachment contains Independent Verification techniques for typical components and has been provided to assist in developing facility specific guidance. The following is a list of the subjects addressed.

1. Valves, Manual (Unlocked)
2. Valves, Manual (Locked)
3. Valves, Manual (Throttled)
4. Motor Operated Limit Torque Valves
5. Air Operated Valves
6. Summary of verification techniques to determine valve position
7. Blank Flanges/Spectacle Flanges/Spool Pieces
8. Circuit Breakers (480V or less only)
9. Circuit Breakers (480V)
10. Circuit Breakers (4160 V) (Typical)
11. Direct Current Circuit Breakers
12. Fuse Installation
13. Lead Termination
14. Fuse Removal
15. Lifting Leads

1. Valves, Manually Operated (Unlocked)

To verify open, manipulate in the closed direction only as necessary to remove any slack from the operating mechanism and verify valve stem movement. Return to original position.

To verify closed, manipulate in the closed direction only as necessary to verify the valve is fully closed, and not just binding or difficult to operate. Avoid overtorquing.

2. Valves, Manually Operated (Locked)

Ensure that the locking device is mounted securely to prevent the movement of the valve and that the padlock is in a locked position.

For a locked open valve, attempt to move the valve in the closed direction to determine that the locking device does keep the valve open.

For a locked closed valve, check that the valve is closed by moving the valve in the closed direction only.

Undue slack in the locking device that permits excessive movement shall be immediately reported to shift management.

ATTACHMENT A (CONT'D)

INDEPENDENT VERIFICATION TECHNIQUES (CONT'D)

3. Valves, Manually Operated (Throttled)

Valves that are required to be verified in a throttled position should be verified to be in the proper position by using an appropriate process parameter, as described in the Local Permit or COL.

Verifying throttled valves by shutting and opening the valve a prescribed number of turns should be avoided because this practice has the potential to create valve mispositionings.

Position indicators, scribe marks, or other officially recognized and designated indicators should be used to determine throttled valve positions.

When shutting and opening a throttled valve is necessary to determine its position, having a verifier observe a valve operator's actions is preferable to having both persons independently shut and open the valve. This would cause the verification to be partially nonindependent, but is preferred in this case because operating a valve to check its position effectively nullifies any previous check.

4. Motor Operated Limit Torque Valves

Motor operators are normally equipped with two types of switches. They are:

- 1) geared limit switch
 - can be set to open or close valve
 - stop valve travel at any point
 - driven from the drive sleeved bevel gear or the worm gear
- 2) torque switch assembly
 - set to de-energize the motor at a preset torque on closing or opening, or to prevent valve damage
 - tripped by axial movement of the worm gear

Remote position indication (lights) for motor operated valves.

- lights are activated as follows:

TYPE OF VALVE INDICATING LIGHTS ACTUATED BY:

Gate or Globe - close direction - torque switch
 - open direction - geared limit switch

Butterfly - open and closed-geared limit switch (backed up by torque switches)

ATTACHMENT A (CONT'D)

INDEPENDENT VERIFICATION TECHNIQUES (CONT'D)

- valve position verified by one of the following:

- 1) Local Position Indication
 - by a dial indicator driven off a gear in the valve stem assembly (butterfly valves)
 - observation of stem position (on certain valves; but not as sole means)
- 2) Verification of Motor Operated Valve Position (Summary)
 - by remote indication lights open or closed, both lights on indicate an intermediate position
 - by the local dial indicator

The COL or procedure should specify which of the foregoing methods is issued to determine valve position.

5. Air Operated Valves

Verification is achieved by one of the following:

- 1) Position Indication (Remote)
 - indicator lights, open, closed
- 2) Position Verification (Local)
 - mechanical position indicator on the valve stem, open or closed

6. Summary of Verification Techniques to determine valve position.

Verification techniques fall into two broad categories; direct verification or indirect verification.

1) Direct Verification includes:

- manipulating the valve in the closed direction only to verify both closed and open position
- observation of the valve stem to aid in the determination of valve position
- observation of mechanical position indicator activated by valve stem travel

ATTACHMENT A (CONT'D)
INDEPENDENT VERIFICATION TECHNIQUES (CONT'D)

2) Indirect Verification includes:

- observation of remote position indicators (lights)
- use of process parameters
- observation of a mechanical position indicator actuated by gears off a motor driver (i.e. Limit Torque)

The COL or procedure will specify how the valve position is to be verified.

7. Blank Flanges/Spectacle Flanges/Spool Pieces

Verification is achieved by observing that the required fixture, as described below, is properly installed:

- Placement of blank flange in a line to insure positive isolation.
- Spectacle Flange is a double flange, blank at one end and the other with an opening equal to the pipeline diameter.
- A Spool Piece is a short section of piping with flanges at both ends.
 - may be installed to permit temporary operation of a system.
Example, Boiler Feed Pump Steam turbine supply from auxiliary steam during shutdown to permit testing.

These devices must be uniquely identified, See Chapter 8, Step 5.9, Temporary Modification Control.

8. Circuit Breakers (480V or less only)

(Load Center Circuit Breakers - Drawout type air magnetic)

Verification is achieved by observing one or more of the following:

- 1) open or closed as shown by indicating lights on panel
- 2) open or closed as shown by indicator or breaker itself
- 3) Racked out to Test or Disconnect position
- 4) racked in, i.e., flush with the cubicle face
- 5) completely removed from cubicle
- 6) locking device properly installed on locking hasp (Locks breaker open)

ATTACHMENT A (CONT'D)

INDEPENDENT VERIFICATION TECHNIQUES (CONT'D)

9. Circuit Breakers (480V)

(molded case circuit breaker)

NOTE: Locking device frequently used to lock open, tag usually hung inside cubicle (may not be visible from outside).

Verification may be achieved by observing one or more of the following:

- 1) breaker is tripped via overload device
- 2) locking device is properly installed
- 3) a tag is hung on the locking device

10. 4160V Circuit Breakers (Typical)

Verification may be achieved by observing one or more of the following:

- 1) Local Indication
 - lights - none (Note: Light bulbs could be burned out, do not use extinguished light as sole verification)
 - control power off
 - breaker racked out
 - colored light - breaker closed and racked in
 - different colored light - breaker open and racked in
 - spring charged
 - cell switch made up
- 2) Inside Cabinet for "Racked In" (off floor)
 - flags
 - "Closed" & "Charged"
 - "Open" & "Charged"
 - fuse block
 - "ON" positioned on upper left corner of fuse block
- 3) Inside Cabinet for "Racked Out" (on the floor)
 - flags
 - "Open" & "Discharged"
 - fuse Block
 - "OFF" positioned on upper corner of fuse block
- 4) Inside Cabinet for "Racked Out" (Test Position)
 - flags
 - "Open" & "Charged"
 - handle to left of Circuit Breaker down
 - fuse Block
 - "OFF" positioned on upper left corner of fuse block

ATTACHMENT A (CONT'D)

INDEPENDENT VERIFICATION TECHNIQUES (CONT'D)

11. DC Circuit Breakers

(Generally a switch on the front of a breaker cubicle)

Verification may include determining:

- 1) switch position ON, OFF
- 2) locking device is properly installed

12. Fuse Installation

The verifier shall ensure that the fuse is installed in the proper location by verifying it is installed in the correct:

- facility (some facilities have two steam plants for example)
- building
- fuse enclosure: MCC, load center, panel, etc.
- fuse holder

13. Lead Termination

The verifier shall ensure that the Lifted Lead which was terminated, was terminated in the proper location by verifying it is installed in the correct:

- facility
- building
- terminal block enclosure: MCC, load center, panel, etc.
- terminal block number

14. Fuse Removal

Typically the fuses to be verified on COLs or Local Permits are of the cartridge type (1 to 3" long).

To verify that the correct fuse is to be removed the verifiers shall ensure the fuse location agrees with the required:

- facility
- building
- fuse enclosure: MCC, load center, panel, etc.
- fuse holder

ATTACHMENT A (CONT'D)

INDEPENDENT VERIFICATION TECHNIQUES (CONT'D)

Determine that the correct fuse is to be pulled by matching the required fuse number to the actual fuse to be pulled.

When removed, ensure the fuse removed is tagged and stored.

15. Lifting Leads

To verify that the lead to be lifted is the correct one, the verifiers shall ensure the lead location agrees with the required;

- facility
- building
- lead enclosure: MCC, load center, panel, etc.
- lead number

Determine that the lead to be lifted is the correct one by matching the required Lead number to the actual Lead Lifted.

Ensure that the Lead Lifted is tagged and taped. .

Ensure that the tagging attached to the Lifted Lead agrees with the required procedure or other authorizing document .

WESTINGHOUSE CONDUCT OF
OPERATIONS MANUAL

INDEPENDENT VERIFICATION (U)

Manual
Chapter
Page
Effective Date

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10, Rev 1
20 of 20
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1.0 PURPOSE

This chapter provides direction for establishing and maintaining operating logs for all key operations positions in order to fully record the data necessary to provide an accurate history of facility operations. As used in this context, logs are defined as a narrative sequence of events or functions performed at a specific shift position, as opposed to the operator round sheets that are discussed in Chapter 2, Shift Routines and Operating Practices. This chapter describes the features needed in the operation logs to ensure they are properly maintained.

2.0 SCOPE

This chapter applies to narrative operating logs that are maintained to provide an accurate history of facility operations, and to reconstruct important events. Events should be recorded in a timely fashion in order to ensure the accuracy of the entry. The scope, type, and data required by management is properly entered into the logs. This includes documentation of actions taken, activities completed, transfer of information among operators, and data necessary for event reconstruction.

A review schedule for the operating logs should be established to ensure they are adequately maintained and that operations personnel are aware of the information contained in the logs. Administrative controls should be established to ensure that all operating logs are readily available for a sufficient period of time to allow for the transfer of information among the operators.

3.0 DEFINITIONS

OPERATING LOG - a chronological record of events or functions recorded by individuals assigned to key positions. Operating logs are used by personnel to provide a method for recording system and equipment operating information during the routine performance of their assigned duties and to provide an accurate history of plant operations. Operating logs may be bound books or individual sequentially numbered pages in a loose leaf type binder.

KEY POSITION - a position function to which a person must be assigned and present in order that a facility process or operation can be safely conducted. Individuals who support the operation such as Health Protection, Quality Assurance, etc., but whose absence would not directly preclude operation of the process, are not considered Key Positions. Key positions, for the purpose of this instruction, include only individuals assigned to the facility operations organization. Designation as a key position does not imply that an individual must be assigned to the position at all times. However, key positions are those which must be filled when the process is in operation. Key positions shall be identified by each facility.

ROUND SHEET - a written record of system parameters for equipment and areas located within the responsibility of a particular operator position. Round sheets contain information such as time of observation, maximum and minimum acceptable operating parameters, and normal operating ranges. Round sheets also should contain a narrative section for describing causes for abnormal conditions, for noting actions taken to correct abnormal conditions, and for indicating that supervisors have been notified of abnormal conditions. As an alternative to the narrative section on round sheets, narrative records may be maintained in bound or loose leaf binders.

4.0 RESPONSIBILITIES

4.1 FACILITY MANAGERS

Facility Managers shall ensure that logs and records that cover operations in their areas of responsibility are properly maintained and used.

4.2 SHIFT SUPERVISORS

Shift Supervisors shall ensure that data and information are properly entered in appropriate logs and records.

4.3 OPERATORS

Operators have the responsibility for maintaining logs pertinent to their assignments as directed by the operation or activity procedure.

5.0 PROCEDURE

5.1 GENERAL

Operating logs shall be maintained by personnel in all key positions.

A narrative section shall be provided on round sheets when a narrative log is not used. As a minimum, a narrative log should be maintained by the operations supervisor or the control area operator. For those shift positions that are manned on a part-time basis (e.g., radwaste operator, makeup plant, etc.) a log should be established to ensure that pertinent information is passed from operator to operator.

Operating logs require at a minimum the following controls:

- Each log shall be clearly identified (titled) using the title of the shift position which will make entries.

- Each log shall have sequentially numbered pages.
- The beginning and ending time period covered by each log shall be identified (the ending date can be entered when the log is filed).
- Entries made during the shift shall be consecutive and chronological with no blank lines.

Loose leaf operating logs shall be maintained and controlled the same as bound logs. Loose leaf pages shall be sequentially numbered and provide sufficient identifying information (facility, key position, date) to provide easy recognition.

When entries are completed, operating logs are considered permanent records. The logs shall be reviewed for completeness, accuracy and legibility, and authenticated (signed and dated) at the end of each shift by the person that completes them.

Information regarding activities or events for each key position shall be recorded promptly throughout the shift in order to ensure the accuracy of the entry. The time of each event shall be indicated in the left-hand margin using a twenty-four hour clock notation. Delaying the recording of activities or events often leads to incomplete or inaccurate entries.

Entries made in all shift operating logs must be easily read and understood, and be reproducible with a standard photocopy machine. All entries shall be made using black indelible ink (ball point or other non water-base). Only personnel qualified/trained for a key position, or personnel in training and under the direct supervision of a qualified/trained personnel, are authorized to make entries in operating logs for that position.

Anyone requesting a log entry may do so with the approval of the qualified person. Entries shall be signed or initialed by the person making them. The qualified person shall also sign beneath the entry to signify permission granted to make entry but not agreement with the entry.

Corrections - When a correction is required to an entry, the correction shall be made as follows:

- Draw a single line through the incorrect entry.
- Enter the correct information, the date the change is made, and the initials of the person making the correction.
- Make all corrected entries as near as possible to the lined out entry.
- Do not erase or cover up information.

Late Entries - If an entry is to be made which is not in chronological sequence, it shall be identified as a Late Entry. One method that may be used is as follows: (1) time the entry is made (twenty-four hour clock) followed by (2) "Late Entry", (3) the entry narrative, (4) time the entry described occurred, and (5) initials of person making the entry.

5.2 INFORMATION TO BE RECORDED

The operations supervisor should provide written guidance to define thoroughly the type and scope of entries for each log and the format for making entries. The following information shall be recorded in at least one facility log, although any one log might not contain all these items:

- Criticalities and appropriate critical data (for DOE reactors).
- Facility mode or condition changes.
- Abnormal facility configurations.
- Status changes to safety-related and other major facility or area equipment.
- Occurrence of any reportable events.
- Initiation and completion of surveillance tests.
- Pertinent changes to Operational Safety Requirements and/or Technical Specifications.
- Security incidents.
- Personnel injuries or contaminations.
- Out-of-specification chemistry or process results.
- Shift reliefs.
- Related engineering, maintenance activities, and/or related activities from other departments, department activities.
- The offgoing and oncoming crews (operators and supervisors) shall sign their logs to release or take control of a shift.
- Any other information deemed necessary to log by the supervisor.

LOGKEEPING (U)

To aid in event reconstruction, as much significant information as possible should be logged during emergencies and abnormal or unexpected events. However, logkeeping should not take precedence over controlling and monitoring the facility.

5.3 LOG REVIEW

Log reviews shall take place, at the latest, immediately after shift change.

The reviewer will initial in the margin or other designated location upon completion of review.

The oncoming Shift Supervisor shall review, as a minimum, the two previous shifts of the system and/or operational logs (including operators' log) under their cognizance.

The oncoming operator(s) shall review, as a minimum, the previous 24 hours (two previous shifts) of the operator logs for their work area. The operators may review the supervisor's log with the supervisor's permission.

Facility managers shall review logs under their cognizance on a daily basis when they are at the facility. These reviews shall ensure that entries are accurate and adequate. The reviewer's signature, the time and date should be entered.

5.4 STORAGE OF LOGS

Completed narrative logs shall be maintained at the designated work station a sufficient time to allow for Operations Turnover (e.g., normally 24 hours) and in the facility for a minimum of thirty days.

The completed log shall then be sent to a designated records storage facility to ensure preservation of the log for the life of the facility.

The designated storage facility shall identify logs in a manner allowing for rapid retrieval.

6.0 REFERENCES

1. DOE Order 5480.19, Conduct of Operations Requirements for DOE Facilities.

7.0 ATTACHMENTS

None

WESTINGHOUSE CONDUCT OF
OPERATIONS MANUAL

LOGKEEPING (U)

Manual
Chapter
Page
Effective Date

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6 of 6
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1.0 PURPOSE

This chapter establishes the instructions to be followed during shift turnover to ensure that each operator is provided the knowledge required to adequately accomplish their shift responsibilities.

2.0 SCOPE

This chapter describes the controls necessary for conducting an orderly and accurate transfer of information regarding a facility's overall status at shift turnover using a standard checklist format. Shift turnover is a critical part of DOE facility operation. Personnel should not assume operational duties unless they are physically and mentally fit to do so and until they and the offgoing personnel have a high degree of confidence that an appropriate information transfer has taken place.

Oncoming personnel should conduct a comprehensive review of appropriate written (logs, records) and visual (equipment, control boards) information before responsibility for the shift position is transferred. Oncoming personnel could arrive early or offgoing personnel could stay late so that adequate review time is available.

Shift turnovers should be guided by a checklist and should include a thorough review of appropriate documents describing important aspects of facility status and should include an inspection of appropriate facility instrumentation. These reviews should then be complemented by a discussion between the offgoing and oncoming operators.

3.0 DEFINITIONS

CHECKLIST - a form used by personnel to aid in the turnover process which provides a convenient method of denoting equipment in service or out of service, work in progress, completed or to be performed, unusual conditions or events, and provides oncoming personnel with a list of documents for review to ensure a complete transfer of facility status information.

SURVEILLANCE - procedure that is used to verify equipment and systems compliance with Operational Safety Requirements or Technical Specifications.

STABLE CONDITION - period of time when no evolutions (i.e., surveillances, power level, or equipment changes) are in progress that would normally require the attention of or probable response of an operator.

WALK-DOWN - a detailed review of each control board by the oncoming and off-going operator.

4.0 RESPONSIBILITIES

Shift personnel shall normally conduct the shift turnover at the shift operating base in a professional manner.

The offgoing person shall be prepared for relief by having round sheets, status lists, logs, and turnover checksheets complete, as appropriate, and ready for review.

Shift personnel shall be responsible for reviewing and understanding the logs and checklists associated with the shift position that have been generated during the previous twenty-four hours.

Prior to assuming the shift, each operator and supervisor shall personally verify important operating parameters, especially those pertaining to safety systems under their responsibility. Shift turnovers should include a tour of the shift position to determine equipment status and the status of work in progress.

The offgoing operator and supervisor shall not leave the work area until satisfied that the relieving operator or supervisor is fully aware of existing conditions.

Each shift position shall be relieved only by a person who is qualified to assume the shift position.

No person shall assume a shift position unless they are physically and mentally fit to competently discharge the responsibilities of the shift position.

No person shall permit their relief to assume the shift if there is doubt that the relief is alert, coherent, and fully capable of performing the assigned duties. The Shift Supervisor shall make the determination of fitness for work if a question concerning an individual's fitness exists.

The Facility Manager shall be responsible for developing, approving, and maintaining shift turnover checklists.

5.0 PROCEDURE

5.1 TURNOVER CHECKLISTS

As a minimum, supervisory positions shall have a turnover checklist.

5.2 EQUIPMENT OPERATOR CHECKLISTS

Equipment operator checklists, or other formal documents, shall provide for noting major component status (e.g., operating pumps, trains in service, etc.), abnormal lineups, valid alarms on all pertinent local control panels, and surveillances or evolutions planned or in progress.

Provisions shall be made for documenting that a review of round sheets and logs have been performed by the oncoming operator.

5.3 OPERATOR CHECKLISTS

Operator checklists reviewed at shift turnover shall provide for recording vital information about facility status. The following criteria should be included if appropriate:

- Facility power level, test status, or equivalent
- Key temperatures limit status
- Key pressures limit status
- Important tank levels
- Safety equipment status
- Operational limits in effect
- Other important parameters
- Required chemistry or process sample times
- Maintenance, surveillances, tests, or evolutions (in progress or planned)
- Problems experienced with equipment and major equipment out of service
- When specific planned actions are required
- Changes in radiological or hazardous materials conditions
- Temporary procedure changes in effect.

Operator checklists shall require documenting reviews of certain facility status documents. These reviews may include the operator's own operating log, the lockout and tagout log, the temporary modification and jumper logs, the out-of-service alarm log, the operational limit action log, timely orders, and

required reading (designated as "immediate reading") which has been changed or issued since their last shift or duty.

Each operator checklist shall be provided with enough space for the offgoing operator to list other important information.

5.4 SHIFT SUPERVISOR CHECKLISTS

Shift Supervisor checklists reviewed at shift turnover shall provide vital information about facility status. The following criteria should be included, if appropriate:

- Facility status
- Evolutions (completed, in progress, or planned)
- Controlled key status
- Abnormal lineups or conditions
- Changes in radiological or hazardous substance conditions
- Surveillance tests planned or in progress
- Maintenance planned or in progress
- Waste management status
- New or additional training.

Shift Supervisor checklists shall require documenting review of certain status documents. These may include the items listed in Step 5.3 and Shift Supervisor's log, status logs, equipment status checklists, and emergency safeguards equipment list since the last shift.

5.5 DOCUMENT REVIEW

Oncoming operators and supervisors shall review documents specified on their checklists prior to assuming responsibility for their shift position.

Document review shall be as intensive as necessary for the oncoming personnel to understand important history, present status, and planned events. Normally, narrative log entries for the previous twenty-four-hour period (two previous 8 hour shifts or equivalent for different shift schedule) shall be reviewed.

Status logs shall be reviewed so that the operator and supervisors are familiar with all currently active entries, with an emphasis on what has changed since their last duty shift.

5.6 CONTROL PANEL WALKDOWN

The purpose of a control panel walkdown is to determine a facility's current status through observation of the system control indicators (i.e., switch positions, lighted alarms, chart recorders, status-lights, etc.). Action shall be initiated to promptly replace or repair all burned out indicating lights. Control Panel walkdowns shall be made by the oncoming control area operator accompanied by the offgoing operator to allow for discussion and exchange of information.

Oncoming shift supervisors and other facility operators shall perform a walkdown of the control panels for all systems & equipment within their area of responsibility. Supervisor walkdowns shall be made before, during, or shortly after shift turnover as specified by facility instructions.

5.7 DISCUSSION AND EXCHANGE OF RESPONSIBILITY

Sufficient time shall be allotted at turnover to allow the offgoing shift to discuss and explain any important items which affect facility operations and safety, with the oncoming shift/relief personnel.

Oncoming personnel shall ask questions at this time to satisfy the need for a complete understanding of their responsibilities.

When both the oncoming and offgoing shifts are satisfied that the oncoming personnel are aware of the facility conditions, the oncoming personnel shall state that they are assuming responsibility for the shift position by making an entry into the log. Only at this time is the offgoing shift relieved.

5.8 SHIFT BRIEFING

Shift supervisors should, where practicable, conduct shift briefings for all personnel in their area shortly after assuming responsibility for the shift. If necessary, shift briefings may be performed separately at each work station. The purpose of these briefings is to better outline and understand shift priorities and objectives. The topics of discussion at a shift briefing shall include:

- A review of the facility status.
- New and continuing problems with systems or equipment.

- Work in-progress and planned for the shift.
- Any changes in personnel assignments.

Briefings may include representatives from other organizations such as Maintenance, Health Protection, Quality, etc., if attendance by such organizations is necessary for scheduled work to be performed during the shift that can directly affect operations. This practice results in better understanding of shift priorities and objectives among operations and support personnel.

5.9 RELIEFS OCCURRING DURING THE SHIFT

Reliefs occurring during the shift as a result of meetings, lunch breaks, etc., shall meet the requirements of step 5.7.

Document and log reviews, control panel walkdowns, and discussion may or may not be necessary depending upon the oncoming person's familiarity with the current facility conditions. It is the responsibility of both the person being relieved and the oncoming relief person to determine the amount of turnover necessary for relief.

6.0 REFERENCES

1. DOE Order 5480.19, Conduct of Operations Requirements for DOE Facilities.

7.0 ATTACHMENTS

None

OPERATIONS ASPECTS OF FACILITY
CHEMISTRY AND UNIQUE PROCESSES (U)

1.0 PURPOSE

This chapter implements the important aspects of operations involvement in chemistry and unique processes.

2.0 SCOPE

Operational monitoring of facility chemistry or unique data and parameters should ensure that parameters are properly maintained. Monitoring parameters is important to verifying system operation is in conformance with design expectations. For example, water systems in reactors can be adversely affected by accelerated corrosion, wear or degradation. Similarly, ventilation systems at process facilities depend on parameters such as flow differential pressure, and filter efficiency. Monitoring will identify problems such as boiler feed air inleakage, failed fuel, resin depletion, sewage treatment discharge, or environmental well sampling, before components or safety are adversely affected. Maintenance of proper chemistry will promote maximum component lifetime. A close coordination between the operations and chemistry departments is necessary for this to be effective.

In order to enhance proper process control of systems, operations personnel must have an understanding of all facility processes and must effectively coordinate operations activities with the respective technical process support departments.

Operators should understand the responsibilities associated with their positions (both in process monitoring and control and in interface with the technical process department). So that they can identify early signs of process-related problems. Operators should also understand how equipment and operational problems affect process conditions. A good working relationship between the operations and technical process departments should be established so the facility staff can effectively control facility processes.

3.0 DEFINITIONS

ANALYTICAL CHEMISTRY (AC) - branch of chemistry dealing with techniques which yield any type of information about systems which use, contain, generate, or rely on chemicals.

4.0 RESPONSIBILITIES

**OPERATIONS ASPECTS OF FACILITY
CHEMISTRY AND UNIQUE PROCESSES (U)**

4.1 COGNIZANT ORGANIZATIONAL MANAGER

The Cognizant Organizational Manager shall assure that each operator's specific responsibilities with respect to chemistry control are defined through approved procedure and specific facility/process training is appropriately addressed.

4.2 OPERATORS

Operators shall consult with and be advised by Analytical Chemistry (AC) personnel as needed.

4.3 AC PERSONNEL

AC personnel shall provide lab support for operations, using approved AC procedures.

4.4 OPERATOR RESPONSIBILITY

The operations supervisor should define each operator's specific responsibilities with respect to process control. In general, operators should monitor chemistry or process parameters using control room instruments and other instruments related to equipment under operations control. Operators should consult and be advised by chemistry or technical process department personnel. By monitoring key parameters and taking appropriate action promptly, long-term adverse effects of chemistry or process problems can be avoided or minimized.

Operators shall monitor chemical parameters as specified by approved operating procedures.

Operators shall be able to recognize out-of-specification conditions or adverse trends, and be familiar with corrective actions associated with chemical problems and out-of-specification conditions.

Operators shall be knowledgeable of the appropriate facility chemistry aspects that affect system operations and should be able to analyze off-normal situations and take appropriate action to correct the cause(s) of problems. Examples of the types of concepts and processes with which operations personnel should be familiar include the following:

- Basic concepts of pH, conductivity, cation conductivity, dissolved oxygen, molarity, neutralization, and density, and the effect these parameters have on the facility.

**OPERATIONS ASPECTS OF FACILITY
CHEMISTRY AND UNIQUE PROCESSES (U)**

- The radiochemical indications of failed fuel (reactors)
- How demineralizers and ion exchangers work and how to determine if they are performing efficiently.
- The purpose and hazards associated with the use and storage of facility chemicals such as boron, chromates, hydrazine, acids, caustics, ammonia, solvents containing chlorinated hydrocarbons, and chemicals containing organics.
- System specific chemical and radiochemical parameters associated with Technical specifications/Operational Safety Requirements.
- Chemical parameters monitored in the control area or on local panels under the responsibilities of system operators.
- Properties and hazards of gases used and found at the facility such as hydrogen, nitrogen, carbon dioxide, chlorine, argon, and halon.
- Corrosion problems, including stress corrosion, intergranular cracking, such as caustic attack of stainless steel, dilute acid attack of carbon steel, steam generator tube denting, and ammonia attack of copper alloys.
- The chemical constraints, process equipment, and controls associated with facility radioactive or toxic waste systems.
- Operation of water pre-treatment equipment such as clarifiers or filters.
- Knowledge of operating limits and characteristics of off-normal and unique processes.
- Knowledge of appropriate response and recovery from off-normal or hazardous conditions.
- Contaminants in heat exchanger streams.

The operations supervisor should ensure that these and other topics are appropriately addressed in training programs.

5.0 PROCEDURE

Each operator should be capable of correctly interpreting the chemistry or process parameters that the operator is responsible for and be able to provide appropriate, timely, corrective action when required. High air leakage and

**WESTINGHOUSE CONDUCT OF
OPERATIONS MANUAL**

**Manual
Chapter
Page
Effective Date**

**WHC-SP-0708
13, Rev 1
4 of 4
January 1, 1994**

**OPERATIONS ASPECTS OF FACILITY
CHEMISTRY AND UNIQUE PROCESSES (U)**

poor quality makeup water are examples of conditions that could require operator identification and response.

Operations personnel shall inform appropriate AC personnel prior to commencing system evolutions that have the potential to affect facility processes or require action from support personnel, even if the evolutions are regularly scheduled events.

Operations shall receive reports from AC personnel on process results and problems. The Cognizant Organizational Manager shall specify the analyses and timeliness of the requests.

Operations and AC personnel shall work closely to provide prompt corrective action when chemistry related problems occur.

6.0 REFERENCES

1. DOE Order 5480.19, Conduct of Operation Requirements for DOE Facilities.

7.0 ATTACHMENTS

None

REQUIRED READING (U)

1.0 PURPOSE

The purpose of this chapter is to provide requirements and instructions for a formal system which assures that appropriate individuals are made aware of important information that is related to job assignments.

2.0 SCOPE

It is usually not necessary for a document to be read by all personnel; however, it is essential that a method be provided to ensure that each individual receives the information important to their position. The method should designate which documents should be read by whom and by when. Personnel should be required to understand assigned material. When reading material is not understood, appropriate questions should be directed to supervisors.

3.0 DEFINITIONS

REQUIRED READING FILE - a method to retain reading materials in a convenient location, such as a file drawer, notebook or loose leaf binder.

4.0 RESPONSIBILITIES

4.1 FACILITY MANAGER

The Facility Manager or designee is responsible for overall administrative control of the required reading program, and shall determine what information will be placed in the required reading binder, and maintain a list of the appropriate personnel who must complete required reading.

4.2 SHIFT SUPERVISOR

The Shift Supervisor is responsible for ensuring that the members of the shift under his cognizance remain current on required reading.

4.3 OPERATORS

Each operator and supervisor is responsible for remaining current with required reading assigned, and is accountable for understanding the material.

5.0 PROCEDURE

5.1 TYPES OF DOCUMENTS

Types of documents in the required reading file shall include, but is not limited to, the following:

- Procedure changes
- Equipment design changes
- Technical Specification/Operation-Safety-Requirement Changes
- Industry and in-house operating experience information
- Other information necessary to keep facility personnel aware of current plant activities
- Occurrence reports as appropriate to the facility.

The required reading file shall be maintained and readily available to those individuals who are required to read the material.

Any information which relates to the operation of the facility (i.e., procedure changes and revisions, Occurrence Report, training requirements) and requires formal documentation that the information has been reviewed and understood, may be placed in the system. Care must be exercised to prevent subversion of the system by including information which can be disseminated by less formal means.

The Facility Manager or designee is responsible for designating, based on the nature of the material, who is required to read each document and the required completion date, typically within thirty days.

- Certain documents important to operation of the facility, shall be marked "immediate reading." These documents shall be read by designated personnel prior to assuming shift duties.

5.4 REQUIRED READING PROGRAM

The Required Reading Program shall have an index similar to the Required Reading File Index shown on Attachment A. The Index shall include the following:

- Required Reading ID #
- Document Title
- Issue Date
- Required Completion Date
- Actual date completed.

REQUIRED READING (U)

5.5 REQUIRED READING DOCUMENT

Each Required Reading document shall have a cover sheet similar to the Required Reading Review Record shown on Attachment B. The cover sheet shall include, in addition to that on the index in Paragraph 5.4 above, the following:

- List of individuals required to read the document
- Spaces for each individual to sign and date the record to acknowledge their understanding of the document.

5.6 STATUS

The status of required reading assignments shall be reviewed on a monthly basis.

- Verification that personnel have completed readings by the required dates.
- Completed reading shall be removed from the active file.
- Completed reading text shall be placed in a "dead" file and retained for a minimum of two years for reference and in support of operations training requirements.

6.0 REFERENCES

1. DOE Order 5480.19, Conduct of Operations Requirements for DOE Facilities.

7.0 ATTACHMENTS

Attachment A - Example Required Reading File Index
Attachment B - Example Required Reading Review Record

ATTACHMENT A

EXAMPLE REQUIRED READING FILE INDEX

REQUIRED READING REVIEW RECORD				
Organization/Facility _____				
Required reading number	Document identification	Issue date	Required completion date	Date completed

_____ Reviewer Signature/Date	_____ Reviewer Signature/Date
_____ Reviewer Signature/Date	_____ Reviewer Signature/Date
_____ Reviewer Signature/Date	_____ Reviewer Signature/Date

ATTACHMENT B

EXAMPLE REQUIRED READING REVIEW RECORD

REQUIRED READING REVIEW RECORD		
<u>Organization/Facility</u>		
<u>Issue date</u>	<u>Required reading number</u>	
<u>Document identification</u>	<u>Required completion date</u>	
The personnel listed below are to review and, by their signature, acknowledge their understanding of the document(s) identified above. If the document(s) is/are not understood, questions should be directed to appropriate supervision.		
Name	Signature	Date completed

"Name" column to be filled in with names of individuals required to read the specified document.

WESTINGHOUSE CONDUCT OF
OPERATIONS MANUAL

Manual
Chapter
Page
Effective Date

WHC-SP-0708
14, Rev 1
6 of 6
January 1, 1994

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TIMELY ORDERS TO OPERATORS (U)

1.0 PURPOSE

The purpose of this chapter is to provide a means for Operations management to disseminate essential short-term information and administrative instructions to appropriate personnel. Other means of disseminating guidance to operators are addressed in Chapter 14, Required Reading, and Chapter 16, Operations Procedures.

2.0 SCOPE

This chapter provides a means of transmitting daily management direction to appropriate personnel and a method of periodic review to remove outdated information.

The changing needs and requirements of DOE facility operations necessitate that a program be implemented to disseminate information to operations personnel in a timely manner. To ensure that this information remains current, periodic reviews to remove outdated information should be included in the program.

3.0 DEFINITIONS

TIMELY ORDER - a written communication containing information prepared by Facility Management to relay information of importance to appropriate personnel.

DAILY ORDER - for the purpose of this procedure daily orders are those normally issued to cover a period of twenty-four hours except for weekends and holidays.

4.0 RESPONSIBILITIES

Facility Managers shall issue Timely Orders. This responsibility may be delegated.

5.0 PROCEDURE

5.1 TIMELY ORDERS

Timely Orders shall be issued by the cognizant organizational manager or their designee, whenever necessary to communicate with shift personnel. Information such as special operations, administrative directions, special data-collection requirements, plotting process parameters, work priorities, announcements of policy information and other similar short-term matters may be included in

Timely Orders. Examples of orders could include instructions on the need for and performance of specific evolutions or tests; it could also include work priorities, announcements of policy information, and administrative information.

- Timely Orders shall not be used to change operating procedures because the changes noted in the Timely Orders might be missed by a procedure user. Additionally, Timely Orders may not receive the approval appropriate for a procedural change. Therefore, information intended to supplement operating procedures should be promptly incorporated into the appropriate procedure by a procedure change or revision.

Timely Orders shall be clearly written, dated with issue date, and provided with length of time the order is applicable (date and time).

Current Timely Orders shall be maintained in a designated location such as the control area or Shift Supervisor's office, for easy accessibility by appropriate personnel. Information and policies intended as permanent should be incorporated into appropriate administrative procedures.

Timely Orders shall be segregated into daily and long-term (Standing) orders to facilitate review by appropriate personnel.

Daily orders shall be reviewed by appropriate personnel prior to assuming the shift or as soon thereafter as practicable. The review shall be documented by initialing the log or notebook.

Daily orders shall be reviewed daily and updated as necessary by the Facility Manager (or by the individual delegated the responsibility).

Long-term (Standing) orders shall be reviewed by appropriate personnel when issued and periodically when changes occur. The review shall be documented by initialing the log or notebook.

- Facility Managers shall review Long-Term (Standing) Orders at least quarterly and promptly remove and cancel those that are no longer applicable or are outdated.

6.0 REFERENCES

1. DOE Order 5480.19, Conduct of Operations Requirements for DOE Facilities.

7.0 ATTACHMENTS

None

1.0 PURPOSE

Operations procedures are written to provide specific direction for operating systems and equipment during normal and postulated abnormal and emergency conditions.

Operations procedures should provide appropriate direction to ensure that the facility is operated within its design bases and should be effectively used to support safe operation of the facility.

2.0 SCOPE

Procedures are a key factor affecting operator performance. This procedure provides instructions to ensure procedure development, content, changes and revision, approval, review, availability, and use appropriately addresses and supports safe operation of the facility. Other methods of disseminating operational information are addressed in Chapter 17, Operator Aid Postings.

3.0 DEFINITIONS

PROCEDURE CHANGE - refers to an on-the-spot change, whether for permanent or one time use. Changes do not involve reissuing a procedure.

PROCEDURE REVISION - a new, retyped, reissued edition of a procedure.

4.0 RESPONSIBILITIES

The Facility Manager shall be responsible for implementation of this procedure.

5.0 PROCEDURE

5.1 PROCEDURE DEVELOPMENT

To ensure consistency among operation procedures, a method for developing new procedures, including procedure formats, shall be clearly defined.

- Administrative procedures and/or writers' guides shall direct the development and review process for procedures.
- Procedures shall be developed for all anticipated operations, evolutions, tests, and abnormal or emergency situations.

- Annunciator/alarm response procedures that guide the operator in verifying abnormal conditions or changes in facility status and provide the appropriate corrective action shall be developed for all alarm panels.
- All procedures should provide administrative and technical direction to conduct the intent of the procedure effectively.
- The extent of detail in a procedure shall depend on the complexity of the task, the experience and training of the user(s), the frequency of performance, and the significance of the consequences of error.
- Appropriate attention should be given to writing, reviewing, and monitoring operations procedures to ensure the content is technically correct and the wording and format are clear and concise in accordance with The DOE Writer's Guide (DOE-STD-1029-92). Although a complete description of a system or process is not needed, operations procedures should be sufficiently detailed to perform the required functions without direct supervision.
- Procedure preparation, verification, and validation should receive high-level attention. Qualifications for procedures writers should be considered, including operating organization and experience. Review, verification, and validation should be formalized for written and software procedures.

5.2 PROCEDURE CONTENT

To provide uniformity in operations procedures, the content of procedures shall conform to prescribed guidelines. The procedure aspects described below should be followed when developing operations procedures:

- The scope and applicability of individual procedures shall be readily apparent. Procedures with single-unit applicability should be distinctively identified to avoid confusion with sister-unit procedures. In addition, to enhance rapid retrieval, emergency procedures shall be distinguishable from other procedures. Color coding may be used for these purposes.
- Procedures shall incorporate information from applicable source documents, such as the facility design documents, safety analysis documents, and vendor technical manuals.
- Each step of a procedure that controls or references Operational Safety Requirements (OSR) or a Technical Specification shall have the OSR or Tech Spec identified.

- Prerequisites and initial conditions shall be detailed with careful consideration given to the location of this information within the procedure in order to help ensure that the intent of the procedure is understood.
 - Hoses, tools, or other temporary testing equipment shall be verified operable, calibrated, or inspected and in good condition, where possible, before implementing any test procedure to ensure that they function as expected during the test.
 - Verifications shall be identified in the prerequisite section, with completion sign-offs required when appropriate.
 - "Hold" points (requiring independent verification and/or approval) shall be clearly delineated.
- Definitions used in the procedure shall be explained.
- Procedures shall be easily understood, and actions shall be clearly stated.
- Procedures shall contain only one action per step.
- Procedures shall contain sufficient but not excessive detail.
 - The skill level, experience, and training of the users shall be considered.
- Warnings, notes, and cautions shall be easily identifiable and shall not contain action statements. The probability of missing an action step increases when it is included in a warning, note, or caution.
- Warnings, notes, and cautions shall precede the step to which they apply.
 - These shall appear on the same page as the step to which they apply. This ensures that operators are alerted to necessary information before performing a procedural step.
- Procedures shall be technically and administratively accurate (i.e., the instructions and information should be correct; referenced documents should be correctly identified; and necessary instructions shall be present to guide the user when transferring between procedures).
- Individual sign-offs shall be provided for critical steps.
 - One sign-off shall not be applied to more than one action.

- Limits and/or tolerances for operating parameters shall be specified and be consistent with the readable accuracy of instrumentation.
 - Operators shall not be required to perform mental arithmetic to determine if a specified parameter is acceptable.
- Acceptance criteria for surveillance or test procedures shall be easily discerned, including tolerances and units.
 - If calculations are needed to compare data to acceptance criteria, the calculations shall be clearly explained.
- Sequence of procedural steps shall conform to the normal or expected operational sequence. Training on this sequence, reinforced with procedures that show the same sequence, will serve to improve operator performance by development of patterns of action that are more easily remembered.
- Procedures shall be developed with consideration for the human-factor aspects of their intended use.
 - Reference to components shall exactly match drawing and label-plate identifiers.
 - Units shall be the same as those marked on applicable instrumentation.
 - Charts and graphs shall be easily read and interpreted. Important factors (such as operating limits, warnings, and cautions) shall be highlighted.
- Emergency operating procedures shall provide guidance in responding to single and multiple incidents.
- Portions or steps of other procedures that are used or referred to when performing a procedure shall be specifically identified within the procedure so that operators will not be confused when transferring between procedures.
- Component or system shutdown, startup, and restoration requirements following shutdown or a surveillance or test activity shall be specific and controlled by the procedure.

5.3 PROCEDURE CHANGES AND REVISIONS

Procedure changes and revisions are necessary to ensure that procedures reflect current operating practices and requirements. The review and approval process for each procedure change or revision shall be documented. An example Procedure Change Request Form is provided on Attachment A.

Procedure changes and revisions shall conform to the following practices:

- Procedure changes intended for use ~~more than one time~~ shall be documented in a location readily available for operator reference. To avoid the possibility of error, these changes shall also be referenced in the procedure copies used by operators.
- Appropriate procedure changes and revisions shall be initiated when procedure inadequacies or errors are noted.
- Procedure revisions shall be initiated when a significant change has been outstanding for greater than six months or when a procedure has been affected by more than five changes.
- All currently effective procedure changes shall normally be incorporated when the procedure is revised.
- Procedure changes/revisions shall be implemented concurrently with modifications. Procedure updates required by temporary modifications should be handled as procedure "change" and implemented concurrently with the temporary modification installation.
- Important information regarding changes or revised procedures shall be communicated to appropriate operations personnel via the required reading system, pre-shift briefing, or a similar method.
- Documentation of the reason for key procedure steps shall be maintained and reviewed when implementing changes or revisions that alter these steps. This practice is important to ensure that the reason for any step is not overlooked.
- The review process shall involve verification and validation of the procedure using walkthroughs or similar methods.

5.4 PROCEDURE APPROVAL

Operating procedures shall be approved by the Facility Manager.

Procedures that affect safety-related equipment and emergency procedures shall be reviewed by the facility safety review committee or by another appropriate review mechanism.

Procedure revisions shall receive the same depth of review and level of approval as the initial versions. An example Procedure Approval Form is provided on Attachment B.

New and revised procedures shall be approved prior to use.

Changes in operations procedures that do not affect the intent of the procedure shall be approved by two individuals.

- One shall be at minimum a qualified operator.
- The other shall be a member of facility management. For this purpose, management could be interpreted to mean the operations supervisor or a more senior individual within the operating organization.

Within two weeks, these procedure changes should be concurred with by the individuals who would normally approve a revision or the initial version of the procedure.

Changes that alter the intent of a procedure should receive the same approval as a new or revised procedure.

5.5 PROCEDURE REVIEW

New and revised operations procedures shall be reviewed prior to issuance and at a maximum two year interval to ensure that the information and instructions are technically accurate and that appropriate human-factor considerations have been included.

The frequency of reviews shall be specified.

- It may vary with the type and complexity of the activity involved and with time, as a facility reaches operational maturity.

Applicable procedures shall be reviewed after an unusual incident (such as an accident, an unexpected transient, significant operator error, or equipment malfunction).

During reviews, procedures shall be compared to source documents to verify their accuracy.

New procedures shall be validated by walkthroughs in the facility or by operations on a facility-specific simulator to ensure workability.

Example Procedure Review/Comment and Procedure Review Checklist Forms are provided in Attachments B and D respectively.

5.6 PROCEDURE AVAILABILITY

A controlled copy of all operations procedures shall be maintained in the control area for operator reference.

Selected controlled procedures shall be maintained at appropriate locations. For example, controlled procedures for facility shutdown from outside the control area should be maintained at the remote shutdown location(s).

- It may be desirable to have procedures for routine evolutions available at local work stations.

Working copies of controlled procedures shall be available for use during evolutions. Properly controlled and readily available procedures promote use and ensure that operational activities will be conducted in the manner intended.

Since these documents have only a limited lifespan, working copies shall be controlled and a system in place to ensure that outdated procedures are not used and that working copies are replaced according to approved procedures. For example, uncontrolled working copies could be verified by comparison to a controlled copy prior to use.

Controlled annunciator response procedure information shall be easily accessible to the operators responsible for responding to alarms.

It is highly desirable to provide annunciator response procedures at local control panels, or if this can not be done, at an alternate location convenient to the equipment operator.

5.7 PROCEDURE USE

Facility operation shall be conducted in accordance with applicable procedures that reflect the facility design basis.

The requirements for use of procedures shall be clearly defined and understood by all operators.

If the operator believes a procedure to be incorrect, the operator shall stop and notify the Shift Supervisor. The operator shall not proceed until the procedure is changed or resolution is obtained from the Shift Supervisor.

Procedures are prepared for anticipated facility conditions. Operators may take whatever action is necessary during emergency conditions to place the facility in a safe condition, and to protect equipment, personnel, and public safety without first initiating a procedure change.

Procedures shall be open and followed step-by-step when:

- A trainee is conducting activities under the supervision of a qualified individual.
- The operation being conducted is non-routine, complicated in nature, or infrequently performed.
- Evidence exists in the form of incidents or observations that show a general weakness in procedural knowledge.
- The procedure contains signoffs.
- An error in performance could cause significant adverse impact on the facility.
- The procedure contains an Operational Safety Requirement/Technical Specifications.

An operator will not be required to have the procedure open and in step-by-step use if:

- The operation is routine and is of a nature that an error in performance will not have a significant adverse impact on the facility.
- The procedure is readily available and the operation is being conducted exactly as stated in the procedure.

Operators shall be capable of performing the immediate action steps of emergency procedures without reference to the procedure. The emergency procedure shall be reviewed after the actions are performed, verifying all required actions have been taken. Procedures shall be referenced during infrequent or unusual evolutions when the operator is not intimately familiar with the procedure requirements.

During the course of operations, technical and operational requirements change and better ways of doing things develop. To ensure that procedures in use provide the best possible instructions for the activity involved, periodic review and feedback of information are essential.

Consistency in procedure format, content, and wording is essential to achieve a uniformly high standard of operator performance. Operators should not be expected to compensate for shortcomings in such procedures as poor format or confusing, inaccurate, or incomplete information.

**WESTINGHOUSE CONDUCT OF
OPERATIONS MANUAL**

**Manual
Chapter
Page
Effective Date**

**WHC-SP-0708
16, Rev 1
9 of 14
January 1, 1994**

6.0 REFERENCES

1. DOE Order 5480.19, Conduct of Operations Requirements for DOE Facilities.

7.0 ATTACHMENTS

Attachment A Example Procedure Change Request Form
Attachment B Example Procedure Review/Comment Form
Attachment C Example Procedure Approval Form
Attachment D Example Procedure Review Checklist

ATTACHMENT A

Example Procedure Change Request Form

Procedure change request		To (procedure coordinator/group):	
INITIATOR COMPLETES THIS SECTION			
Requested by:	Phone number	Location	Date
Procedure Title	Procedure number/reference		Revision/date
Proposed procedure or revision or cancellation:			
Reason for change			
Procedure coordinator completes this section		Control number	
☐ Revision		☐ New	☐ Cancellation
Procedure coordinator comments:			
Approved	Approved w/comments	Disapproved	Review/Approval
☐	☐	☐	Date
☐	☐	☐	Date
☐	☐	☐	Date
☐	☐	☐	Date

ATTACHMENT B

EXAMPLE PROCEDURE REVIEW/COMMENT FORM

Title		Number/revision
Please review the attached procedure, complete the following, and return this form to: _____ By: _____		
☐ No comments		
☐ Comments have been annotated in this procedure for consideration prior to approval		
☐ The comments shown below are to be dispositioned before the procedure is submitted for approval		
Section or paragraph	Comment	Disposition
Signature or reviewer		Phone no.
		Date

ATTACHMENT C

EXAMPLE PROCEDURE APPROVAL FORM

Manual number	Procedure/policy number	Revision number	Date issued
Title			
This is submitted for your approval or information as indicated below.		Date Required	
Return to: Management Standards			
Distribution			
Name	Organization	Location	Information only
Disposition: (check one)			
1. ☐ Approved as written		3. ☐ Comments attached require resolution	
2. ☐ Approved editorial comments		(complete section below when comments have been resolved)	
		4. ☐ Disapproved; reasons attached	
Contact for resolution of comments, if other than addressee (name and phone number)			
Comments resolved: (must be completed prior to senior staff approval signature if box 3 above is checked)			
Author's initials and date		Reviewer's initials and date	
Senior staff Signature (signature attests to approval of document)			

ATTACHMENT D

EXAMPLE PROCEDURE REVIEW CHECKLIST

Procedure: _____

Procedure number: _____ Revision number: _____

Reviewers: _____

Verification process*

	Walkdown	Operator interview	Desk review	other
1. Can the procedure be performed in the sequence written?				
2. Can the individual steps be performed? <ul style="list-style-type: none">• Each step specifically identified the action to be taken (e.g., open, shut, turn)• Limitations are expressed quantitatively• Equipment and parts are identified clearly and reflect exact equipment nomenclature• Steps requiring sign-off are clearly delineated and adequate sign-off space provided• The procedure accurately reflects the current configuration of the process or equipment• The amount and level of information is adequate				
3. Can the user locate and identify all equipment referred to in the procedure?				
4. Can the user perform the procedure without obtaining additional information from persons or documents? <ul style="list-style-type: none">• If other documents are needed, are they referenced clearly enough to allow the operator to proceed efficiently?				
5. Is the procedure complete (any missing or extraneous steps or information)?				
6. If any follow-up action, test, or procedure must be performed, is that action clearly identified? <ul style="list-style-type: none">• Are correct personnel specified?• Are reporting chains specified correctly?• Are actions or referenced procedures specified correctly?				
7. Is the procedure updated to current guidelines? <ul style="list-style-type: none">• Technical guidelines (e.g., Tech Specs)• Format editorial requirements				

ATTACHMENT D

EXAMPLE PROCEDURE REVIEW CHECKLIST

Procedure: _____

Procedure number: _____ Revision number: _____

Reviewers: _____

Verification process*

8. Is there consistent use of abbreviations, symbols, and acronyms?
9. If cautions are applicable, are they clearly distinguishable and placed immediately ahead of the steps to which they apply?
10. Do graphs, charts, tables, and figures meet all the following criteria:
- Are they compatible with the procedure?
 - Are they legible and readable?
 - Can values be extracted or interpolated easily?
 - Are units of scale and measurement useable?
 - Are titles descriptive of contents and use?
11. Are titles and numbers of referenced documents correct?

Walkdown	Operator interview	Desk review	other

*Check and date verification process for each item. If more than one reviewer participates in the review, each item must also be initialed. Deficiencies or recommendations resulting from this review are to be recorded on a comment disposition form.

Periodic review Form and comment sheets submitted to
Procedure Coordination _____

Date

Reviewers Signature: _____

1.0 PURPOSE

Facility operator aids (information posted for personnel use) should provide information useful to operators in performing their duties. The purpose of this chapter is to provide instructions to facility personnel for requesting, reviewing, approving, and posting of operator aids.

2.0 SCOPE

This chapter describes the process to ensure operator aids are current, complete, and necessary. Information utilized in the operation of plant systems must be properly controlled. The use of informal, unauthorized, or out-of-date instructions, notes, graphs, drawings, and other documents in the facility can detract from proper operation or maintenance. Operator aids provide an important function in the safe operation of the facility. Operator aids may come in many forms: copies of procedures (portion or pages thereof), system drawings, handwritten notes, information tags, curves, and graphs.

3.0 DEFINITIONS

OPERATOR AIDS - information including sketches, notes, graphs, instructions, drawings, and other documents used to assist operators in performing assigned duties.

OPERATOR AID LOG - a notebook containing the operator aid index and copies of all operator aids.

PERMANENT INFORMATION - is information that appears on a medium not suitable to change and determined by the Facility Operations Manager to be applicable indefinitely. An example would be an instruction engraved on a permanent label. Information posted in this format is not considered to be an operator aid in this procedure and should be controlled in accordance with design change requirements, if applicable.

4.0 RESPONSIBILITIES

4.1 FACILITY OPERATIONS MANAGER

The Facility Operations Manager is responsible for:

- Providing overall direction and administration of this procedure.

- Providing liaison with other facility department managers to ensure needed information is available, current, and complete.
- Approving information to be posted as an operator aid.

4.2 SHIFT SUPERVISOR

The Shift Supervisor is responsible for:

- Authorizing the posting and removal of operator aids in the facility.
- Maintaining the Operator Aid Log.
- Directing the periodic review of all operator aids in accordance with Section 5.4.

4.3 FACILITY PERSONNEL

Facility Personnel are responsible for:

- Ensuring operator aids used by personnel in their departments conform to the requirements of this procedure.
- Submitting proposed operator aids to the Facility Manager for inclusion in the program.
- Providing liaison with Operations to ensure that operator aids under their cognizance are removed or updated as required.
- Utilizing only current and approved operator aids in the performance of duties.
- Reporting any unauthorized operator aids observed to the Shift Supervisor for resolution.

5.0 PROCEDURE

5.1 OPERATOR AID

Operator Aid Development, Approval, and Posting

Any facility employee may develop an operator aid, however, it shall be approved prior to posting. All facility personnel should be informed of the importance of controlling posted information and the procedure to be followed

OPERATOR AID POSTINGS (U)

for posting information. Individual requesters desiring to have an operator aid posted shall submit the proposed information to the Facility Operations Manager for approval in a professional format on a suitable medium.

As a minimum, the Shift Supervisor shall review all proposed operator aids and verify the aids are correct and necessary. The Shift Supervisor then completes the operator aid log index by signing and dating. The Facility Operations Manager shall authorize the operator aid by signing and dating in the bottom right hand corner of the operator aid.

- The Shift Supervisor ensures the operator aid is professionally made and properly posted (example: typed not hand written, laminated).

5.2 OPERATOR AIDS USE

Use of Operator Aids

- The use of operator aids shall be minimized.
- Operator aids shall not be posted in a manner that will obscure controls, indication, or indicating lights. They should be suitably protected from the environment and firmly attached in close proximity to where they would be expected to be used or securely fastened to the equipment to which they refer.
- Operator aids shall not be utilized to bypass the normal facility procedure review and approval process. Operator aids that alter procedures shall not be approved. Instead, appropriate procedures shall be changed to incorporate the necessary information.
- Operator aids may supplement approved procedures, but they should not be used in lieu of approved procedures. Operator aids should be viewed as a convenience to the individual using them, not as a requirement. In most cases, operator aids remind users of information that might otherwise be overlooked and provide guidance that is not procedural in nature.
- During routine facility inspections, operations personnel should review operator aids to ensure that they are approved. Unapproved postings shall be submitted for approval or removed. It is important for all personnel to understand that the use of an out-of-date operator aid could be just as detrimental as the use of an out-of-date procedure.

- Some operator aids are graphs, curves, or other portions of approved procedures. To help ensure that these types of operator aids are the most current versions, they should be updated when the "parent" procedure is revised. One way to accomplish this is to notify appropriate document control personnel of those operator aids that are derived from procedures. When a revision is made to one of these procedures, document control would notify the control room to check the affected operator aid and see if changes are necessary.

5.3 DOCUMENTATION

A log of all approved operator aids shall be maintained along with a copy of each aid posted in the facility. This log shall be used during periodic reviews of operator aids in order to help ensure that the posted aids remain current, and to provide a reference copy should an operator aid be found missing during the review.

The operator aid log shall be maintained in the control area or the Shift Supervisor's office. References from which operator aids were derived, control numbers (including revision), and dates of approval shall be provided. The operator aid log index sheet should include the following information:

- Preparer - name of the individual wishing to post the operator aid.
- Date posted - the date the Shift Supervisor authorized the operator aid to be posted.
- Location - area where the operator aid is to be posted. This location should be specific enough to be easily found by the information contained in the operator aid log. "Auxiliary building," for example, is not specific; "Unit 1 Waste Monitoring Panel," however, is more complete.
- Shift Supervisor approval signatures - as a minimum, the Shift Supervisor shall sign the index indicating his authorization to post the operator aid. A copy of the operator aid containing the Facility Operations Managers approval shall be placed in chronological order behind the index.
- Remover/date - when the operator aid is no longer current, correct, complete, or necessary, the Shift Supervisor shall have it removed. The individual removing the operator aid shall initial and date this column. The individual shall remove and forward the copy from the operator aid log along with the posted operator aid to the Facility Operations Manager for record retention as required.

5.4 REVIEW OF OPERATOR AIDS

The Shift Supervisor shall direct a semiannual audit of posted operator aids verifying the following:

- A continuing need exists for each posted aid.
- All aids included in the log are posted.
- The physical location of each operator aid is correct.
- Information contained in operator aids is current and applicable.
- Unauthorized operator aids shall be removed.
- Each operator aid is legible and in good condition, and no unapproved pen-and-ink changes exist.
- Drawings that are approved and posted as operator aids are included in the facility's drawing control system.

The audit shall be documented by writing below the last entry in the operator aid log index "Semi-Annual Audit performed by (name) on (date)." Any operator aids not audited due to inaccessibility shall be listed.

6.0 REFERENCES

1. DOE Order 5480.19, Conduct of Operations Requirements for DOE Facilities.

7.0 ATTACHMENTS

None

WESTINGHOUSE CONDUCT OF
OPERATIONS MANUAL
OPERATOR AID POSTINGS (U)

Manual
Chapter
Page
Effective Date

WHC-SP-0708
17, Rev 1
6 of 6
January 1, 1994

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EQUIPMENT AND PIPING LABELING (U)

1.0 PURPOSE

This chapter provides a method to implement a standardized facility equipment and piping labeling program. A well-established and maintained labeling program should help ensure that facility personnel are able to positively identify equipment they operate. In addition, equipment labeling is required by Occupational Safety and Health Administration (OSHA) regulations.

2.0 SCOPE

This chapter assigns responsibilities and provides instructions for identification of facility equipment using approved labels. Proper implementation of this program will result in consistent, readable, and permanent identification of facility components, rooms, valves, instruments, pipes, breakers, switches, electrical and control panels, and electrical components inside panels. Additionally, methodology for replacement of lost or damaged labels is provided.

A good labeling program, understood and maintained by operating and maintenance personnel, will enhance training effectiveness and will help reduce operator and maintenance errors resulting from incorrect identification of equipment. Personnel radiation exposure or exposure to hazardous materials will also be reduced if operators spend less time identifying components.

The labeling program should continue throughout the life of the facility. Because equipment labels will be continually misplaced or damaged, an ongoing labeling program should exist to allow personnel to identify components needing labels, to identify a person or person responsible for making new labels, and to ensure that new labels are correct and placed on the proper equipment. In addition to equipment, doors to rooms should be labeled so that personnel can identify the room and, if applicable, the equipment inside.

3.0 DEFINITIONS

None

4.0 RESPONSIBILITIES

4.1 FACILITY MANAGER

The Facility Manager is responsible for ensuring that facility equipment and piping under their cognizance are properly labeled.

The Facility Manager is responsible for ensuring that the facility equipment and piping labeling program addresses the following:

- Approving labeling materials for use.
- Assigning unique facility identification designators to unidentified components.
- Revising facility piping and instrument drawings (P&ID) to reflect component identifiers.
- Providing labels that conform to a labeling standard (example as shown in Attachment A) for components added or changed by facility modifications.
- Ensuring an equipment and piping labeling deficiency program is in place which ensures resolution of a label request form.
- Personnel shall look for missing or damaged labels during their normal tours and during other routine activities.

4.2 ALL PERSONNEL

All personnel are responsible for reporting labeling deficiencies by submitting a label request form (example as shown in Attachment B). Housekeeping and material condition inspections offer one opportunity for identifying labeling deficiencies. Special attention shall be given to the following:

- Post maintenance
- Modification and construction
- Personnel shall look for missing or damaged labels during their normal tours and during other routine activities.

5.0 PROCEDURE

5.1 GENERAL

Labels should be placed on or as near as practicable to the equipment to be labeled. The label should be oriented in a manner that is easy to read and so that the correct component is easy to identify.

EQUIPMENT AND PIPING LABELING (U)

For example, labels for switches, indications, and breakers on control or power panels should be placed closer to the identified component than any other component so that the label clearly identifies the correct component. Label placement should not interfere with equipment operation or obscure indicators.

Position labels so they are readily visible and, where feasible, oriented in a horizontal position. Labels should be readable without manipulation by facility personnel.

Labels shall be located to eliminate any possible confusion as to the item being identified and shall not obscure other items nearby.

Label colors shall provide a high contrast between characters and background to enhance legibility.

Label size shall be based on available lighting and anticipated reading distances. Those field components which require local operation during facility blackout or facility shutdown from outside the control area should be marked with reflective or glow-in-the dark tape.

Labels shall be permanently attached and designed to withstand wear and erosion. They shall be heat resistant in high temperature areas.

Use of component identifier and noun descriptions must be consistent among component labels, controlled equipment lists, controlled drawings, facility procedures, checklists, and load lists. System checklists, facility procedures, and installed labels will use the identical name and number nomenclature for the component. Approved abbreviations may be used where appropriate.

A facility specific abbreviation list shall be developed, and only approved abbreviations shall be used.

Color coding may be used to differentiate between units, systems, and/or train designation. Colors for equipment color coding may be assigned only one meaning per color or color scheme and should be consistent with a facility approved color scheme. Fire protection equipment shall be color coded red.

Piping shall be labeled to indicate the fluid contained and the normal flow direction. OSHA color coding for pipes should be used, and pipes containing potentially radioactive fluids, toxic fluids, or explosive gases shall be uniquely marked.

Labels and their attaching devices shall be made from materials that are compatible with their particular application. For example, chloride-free labels shall be used on stainless steel piping or components. Where possible, attaching devices shall be of corrosion resistant materials such as stainless steel.

EQUIPMENT AND PIPING LABELING (U)

Non stainless steel components inside containments, confinements, and other restricted areas should be stenciled when practical to eliminate the possibility of labels becoming contaminated, plugging strainers and drains, or entering pump suctions.

All labels associated with the same component shall use identical name and number nomenclature, e.g., the handswitch, motor control center breaker, and valves. If a remote operator (e.g., handswitch) is uniquely identified, the unique identifier and name of the operated component should also be included on the label.

Labeling of systems and components in high radiation fields shall be evaluated against ALARA program considerations.

Where space does not permit placement of all information described in the labeling standard on a label, priority shall be given to the following in order: unique equipment identification code, component name special use or power supply information, and loads supplied (breaker).

Where possible, attachment devices should be threaded through the valve yoke and label plate. Care shall be taken not to damage the valve stem. Label plates and attachment devices should not be threaded through valve handwheels, operating chains, or damper linkages.

Both ends of the extension of remote, mechanically operated (reach-rod) valves shall be labeled.

Chain-operated valves should be labeled at the valve and should have labels placed on a small piece of plastic pipe or metal ring through which the chain can easily pass so the label is always at the bottom of the chain loop. Where the valve cannot be clearly seen, open or close directional arrows should be included at the chain.

Components requiring labeling:

- Valves and dampers
- Instruments and gages
- Pipes and ventilation ducts
- Major equipment such as pumps, motors, tanks, etc.
- Busses, motor control centers and local power panels, breakers, switches, and instrument panels
- Fuse blocks, fuse locations, relays, terminal boards, and other components inside electrical panels

- Room doors
- Emergency equipment such as fire alarms, fire brigade lockers, and communications equipment
- Fire protection systems

5.2 LABELS

Procedures should be established to ensure that misplaced or damaged labels are replaced. Since labels are often missing after maintenance, the post-maintenance test could require a check to ensure that the appropriate labels are attached. Another method that could be used to check for labels is to add another column to valve lineup sheets that would require the operator to verify that labels are present, readable, and undamaged.

Personnel should become especially observant for situations where a black marking pen has been used for labeling (and then sometimes crossed out and re-labeled) and should replace these informal labels with the proper labels.

Labels shall be developed using a labeling standard (example as shown in Attachment A).

When the need for equipment and piping labeling is identified, the individual shall complete a label request form (example as shown in Attachment B).

The individual completing a label request form shall prepare and attach a temporary label approved by Shift Supervisor (or higher authority) to the component. As a minimum, the temporary label or tag shall consist of the following:

- Unique component identification
- Posted by signature and date
- Verified by signature and date

The label request form shall be forwarded to the responsible Shift Supervisor or designee who shall forward it to the appropriate organization for label preparation.

5.3 INSTALLATION AND VERIFICATION

All labels installed as a result of this program will be verified by qualified operations personnel. The new label should meet the guidelines for label information as addressed in Step 5.1.

- Document the label installation and verification on the label request form.

Installer shall remove temporary label or tag when permanent label is installed.

6.0 REFERENCES

1. DOE Order 5480.19, Conduct of Operations Requirements for DOE Facilities.

7.0 ATTACHMENTS

Attachment A Example Label Standards
Attachment B Example Label Request Form

ATTACHMENT A

EXAMPLE LABEL STANDARDS

1. MATERIAL

1.1 Plastic Labels

Plastic labels or mimics are typically made of two-ply, colored plastic. Plastic materials should be approved for the facility location and application.

1.2 Metal Labels

Stainless steel tags may be used for all components, but aluminum tags should not be used inside a reactor containment. Metal tags should be securely attached to prevent fretting against the attaching wire.

1.3 Adhesives

Only approved adhesives will be used. The adhesive should be verified to be chemically compatible with the plastic used for labeling, the component material where mounted, and the expected environment.

1.4 Wire

Stainless steel wire should be used to attach labels to components where use of adhesives is not practical (e.g., valve tags).

2. LABEL CHARACTER FEATURES AND PLACEMENT

2.1 Label Contrast

Black letters on a white background or white letters on a black background offer the best contrast and legibility. For engraved labels, black letters on a white background are preferred since the reverse combination may lead to loss of readability when dirt and dust fills in the white engraved characters. White-on-black engraved labels may be used if a clear overcoating is provided to prevent dirt from obscuring the white engraved characters. While black-white combinations offer the best contrast, other color combinations may be required for coding purposes, such as differentiating Unit No. 1 from Unit No. 2 components and differentiating unit trains. An approved color standard will be developed to provide unit and/or train-specific labeling color schemes.

ATTACHMENT A (CONT'D)

EXAMPLE LABEL STANDARDS (CONT'D)

2.2 Character Design and Size

- 2.2.1 Character Style - Labels should be formed exclusively with capital letters using simple letter styles. Avoid letter styles with flourishes.
- 2.2.2 Character Width - Character width-to-height ratio for letters should be between 3:5 and 1:1. The width of letters "M" and "W" should be at least 4/5 of the height, and the letter "I" is normally one stroke wide. For numerals, the width height ratio should be 3:5 except the numeral "4" which should be one stroke wider, and the numeral "1", which should be one stroke wide.
- 2.2.3 Character Height - Character size should be based on required reading distance, level of illumination, and importance of the label. For normal illumination environments, character height should be a minimum of 0.004 times viewing distance. The preferred size is 0.006 times viewing distance. A 28-inch reading distance is the nominal viewing distance for a technician or operator stationed directly in front of the equipment being addressed. However, many components are placed far beyond normal reading distances, and associated labeling should be sized to reflect this fact.
- 2.2.4 Character Stroke Width - The stroke width of characters should normally be one-sixth to one-seventh of the character height.
- 2.2.5 Character Spacing - The minimum space between characters should be one stroke width. The minimum space between words should be the width of one character. The minimum space between lines should be one-half character height. Adjacent labels should be separated by sufficient space to preclude confusion that may result from combining the meanings.
- 2.2.6 Hierarchical Scheme - Labeling on equipment operating panels should be size-graduated, with the largest letter size reserved for the overall unit identification, and progressively smaller letters used for subgroupings of panel elements, individual component identification, and control options. As a general rule, there should be about a 25 percent increase in letter size in moving up the scale extending from subordinate labels to the major identifying label. Hierarchical labeling significantly reduces panel scanning time. In a hierarchical labeling scheme, lower-order labels do not repeat information included in higher-level labels.

WESTINGHOUSE CONDUCT OF
OPERATIONS MANUAL

Manual
Chapter
Page
Effective Date

WHC-SP-0708
18, Rev 1
9 of 10
January 1, 1994

2.2.7 Placement - Labels should be placed above the panel elements they describe, except that labels for elements located above eye level should be positioned for visibility. Labels should be oriented horizontally so they can be read from left to right. See Attachment B.

ATTACHMENT B
EXAMPLE LABEL REQUEST FORM

Requestor: _____ Date: _____

Locate/phone: _____

Reason for Label: Missing _____ Incorrect _____ Deteriorated _____

Location of Label: _____

Equipment Description: _____

Information on Label: (fill in box)

Label Dimensions:

Number of Labels Required: _____

Temporary Label Posted By: _____

Signature/date

Install Permanent Label: _____

Return to Requestor for Installation: _____

Shift Supervisor's Signature/date

Shift Supervisor's Signature/date

Permanent Label Installed: _____

Signature/date

Permanent Label Verified: _____

Signature/date

Affected Personnel - an employee whose job requires the use of a machine or equipment on which maintenance is being performed under a tagout/lockout or whose job requires working in an area in which maintenance is being performed.

Analytical Chemistry - branch of chemistry dealing with techniques which yield any type of information about systems which use, contain, generate, or rely on chemicals.

At-the-Controls - the specific floor space where a control operator(s) is stationed and in which other personnel in that area can block the operator's view of instruments, controls, indications, or otherwise restrict or distract from their attention.

Categorization - relative ranking of an occurrence to ensure that the urgency of notification is readily identifiable and that more serious occurrences are highlighted to management.

Checklist - a form used by personnel to aid in the turnover process which provides a convenient method of denoting equipment in service or out of service, work in progress, completed or to be performed, unusual conditions or events, and provides oncoming personnel with a list of documents for review to ensure a complete transfer of facility status information.

Concern - matter of interest that may involve an event or condition adverse to safety, health, quality assurance, security, or has environmental implications.

Condition - as-found state, whether or not resulting from an event, which may involve adverse safety, health, quality assurance, security, or environmental implications. A condition differs from an event in that an event is a real-time occurrence (e.g., pipe break, valve failure, loss of power), whereas a condition is more programmatic in nature. For example, technical inadequacy, such as an error in analyses or calculation; an anomaly associated with design or performance; or an item indicating a weakness in the management process.

Cognizant Organizational Manager - the individual assigned the responsibility for a specific functional area.

Control Area - an area or room having an assemblage of control devices (i.e., switches, dials, breakers, valves) and indicating/monitoring equipment (i.e., meters, gauges, recorders, digital and analog readouts) which are used for the control of a process or system and interruption or improper operation of that process or system could jeopardize personnel safety, hazard the environment or result in significant financial loss.

Critical System - a system which provides safety, environmental, radiological, seismic, fire protection, containment, or other design features for safety or key operational parameters.

Daily Orders - daily orders are those normally issued to cover a period of twenty-four hours except for weekends and holidays.

Emergencies - emergencies are the most serious occurrences and require an increased alert status for onsite personnel and, in specified cases, for offsite authorities.

Event - a real-time occurrence or incident that may involve safety, health, quality assurance, security, or environmental considerations and includes industrial accidents, fires, personal injuries, equipment damage or malfunction (e.g., pipe break, valve failure), severe weather, higher than expected levels of contamination or radiation, operating anomalies (e.g., loss of power), transients and test, or experiments not completed as planned or that produced unexpected results (e.g., unsatisfactory surveillance test).

Facility - equipment, systems, building, utilities, and services whose use is directed to a common purpose at a single location.

Facility Capability - 100% availability of facility systems and equipment.

Facility Manager (FM) - the cognizant Manager having direct line management responsibility, including authority for direct operation of the facility, and having intimate knowledge of the details of day-to-day operations of the facility.

Graded Approach - a term that permits different degrees of detail or scope for a given topic, based on the hazard or risk posed to the facility. A graded approach does not mean automatic dismissal or violation of a control process (e.g., policy or procedure).

Independent Verification - the act of checking by a qualified operator at a separate occasion that a given operation conforms to established operational criteria, as well as checking a component position, independently of activities related to establishing the component's position.

Key Position - a position function to which a person must be assigned and present in order that a facility process or operation can be safely conducted. Individuals who support the operation such as Health Protection, Quality Assurance, etc., but whose absence would not directly preclude operation of the process, are not considered Key Positions. Key positions, for the purpose of this instruction, include only individuals assigned to the facility operations organization. Designation as a key position does not imply that an individual must be assigned to the position at all times. However, key positions are those which must be filled when the process is in operation. Key positions shall be identified by each facility.

Lockout - the application of a lock on a control to render the control inoperative. Other devices (such as wiring a control inoperable, installation of a control defeating device) also may constitute a lesser degree of lockout.

May - means permissible

Maximum and Minimum Values - the highest and lowest parameter values that are either provided by the equipment supplier or determined by actual testing or experience.

Near Miss - a situation which an inappropriate action occurs (or a necessary action is omitted) but is detected and corrected before an adverse effect on personnel or equipment results.

Normal Operating Range - those operating parameter values expected during normal equipment operation.

On-Shift-Training (OST) - that portion of an operator qualification program where the trainee receives training within the job environment and with as much hands-on experience as possible.

Operator - broadly defined as anyone authorized to operate equipment. In addition to operations department personnel, this definition could include chemistry personnel, radwaste technicians, and other facility personnel.

Operator/Operating Personnel - broadly defined as anyone authorized to operate equipment. In addition to operations department personnel, this definition could include chemistry personnel, radwaste technicians, and other facility personnel.

Operator Aids - information including sketches, notes, graphs, instructions, drawings, and other documents used to assist operators in performing assigned duties.

Operator Aid Log - a notebook containing the operator aid index and copies of all posted operator aids.

Operating Log - a chronological record of events or functions recorded by individuals assigned to key positions. Operating logs are used by personnel to provide a method for recording system and equipment operating information during the routine performance of their assigned duties and to provide an accurate history of plant operations. Operating logs may be bound books or individual sequentially numbered pages in a loose leaf type binder.

Procedure Change - refers to an on-the-spot change whether for permanent or one time use. Changes do not involve reissuing the procedure.

Procedure Revision - new, retyped, reissued edition of a procedure.

Qualified Personnel - a person who has been trained in performing duties of lockout and tagout.

Required Reading File - a method to retain reading materials in a convenient location, such as file drawer, notebook or loose leaf binder.

Root Cause - an underlying or initiating event or condition, within management control, that produces the failure of a component which, if corrected, will mitigate the occurrence/recurrence.

Round Sheet - a record of those operating parameters that are to be recorded for equipment and areas located within the responsibility of a particular shift station. These include maximum and minimum acceptable operating parameter values for appropriate equipment. Additionally, space is provided for operator comments.

Shift Operating Base - the operating base is the facility area to which an operator returns when he is not performing other assigned duties.

Shift Operating Practices - actions and checks required as a minimum of operators as they conduct their routine duties.

Shall - means mandatory

Shift Personnel - any person assigned work activities in a facility for any given time period.

Shift Supervisor - the senior individual designated by the position description as responsible for all aspects of operation of the facility assigned, and to whom all operations personnel report during the assigned shift. The Shift Supervisor responsibilities are transferred only through formal turnover to a qualified relief. This responsibility includes all aspects of shift evolutions as related to facility operation, including production, personnel, and equipment safety, both nuclear and industrial environmental protection, maintenance, quality assurance, radiation and contamination control, and employee training.

Should - means preferred

Surveillance - procedure that is used to verify equipment and systems compliance with Operational Safety Requirements or Technical Specifications.

Support Organization - any group that has the responsibility of performing functions to assist the primary mission of the facility.

Tagout - the application of a danger or caution tag on the control that indicates that the control is not to be used except under conditions indicated by the tag.

Timely Order - a written communication normally containing information prepared by Facility Management to relay information of importance to appropriate personnel.

Watch Standing - performing assigned duties within a* defined area of responsibility.

**WESTINGHOUSE CONDUCT OF
OPERATIONS MANUAL**

**Manual
Chapter
Page
Effective Date**

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Glossary, Rev 1
5 of 6
January 1, 1994**

WGOBU - Westinghouse Government Operation Business Unit, comprising Westinghouse Hanford Company, West Valley Nuclear Services Company, Westinghouse Materials Company of Ohio, Westinghouse Idaho Nuclear Company, Waste Isolation Division

WGOCO - Westinghouse Government Owned Contractor Operated Facilities. Operated by Westinghouse for the Department of Energy and includes WGOBU and WSRC.

WSRC - Westinghouse Savannah River Company

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