

WP 04-AD3005

Revision 2

**Administrative Control of
System Lineups**

Management Control Procedure

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APPROVED FOR USE

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INTRODUCTION ¹

The purpose of this instruction is to provide guidance for implementing the requirements found in DOE 5480.19, Chapters VIII and X. These chapters deal with maintaining proper configuration control and providing for independent verification of specific components/systems. The following areas are covered in this instruction:

- Methodology for determining which systems require lineups
- Methodology for determining which systems require Independent Verification
- Instructions for developing system lineups
- Requirements for performing complete or partial system lineups
- Instructions for the performance and review of system lineups
- Documentation requirements for system lineups

The following records are generated by the performance of this procedure:

- Completed System Lineup Checklists (see Attachment 4 for a sample form)
- Fault Tree Analyses (Attachment 1)

REFERENCES

BASELINE DOCUMENTS

- DOE Order 5480.19, *Conduct of Operations Requirements for DOE Facilities*

PERFORMANCE

1.0 RESPONSIBILITIES

1.1 The Cognizant Operations Manager (COM) is responsible for the following:

- 1.1.1 Perform a Fault Tree Analysis on each system under the cognizance of the Operations Manager. The Fault Tree to be used is shown as Attachment 2, Objectives for Fault Tree Analysis. Documentation of the analysis shall be retained.

- 1.1.2 Document the results of this analysis on Attachment 3, System Lineup Index, with the following information:
- The attachment number for the system
 - The system title
 - If a system lineup will be developed
 - If Independent Verification is required
 - The periodicity for conducting a full system lineup
- 1.1.3 Assign personnel to develop system lineups. This will usually be the Subject Matter Expert (SME) or another highly qualified individual.
- 1.1.4 Maintain a System Lineup Index (Attachment 3) which sets forth the requirements for independent verification.
- 1.1.5 Ensure that full system lineups are performed within the specified time.
- 1.2 Facility Shift Managers (FSM)/Cognizant Supervisors (CS) are responsible for the following:
- 1.2.1 Schedule and direct the performance of full system lineups for periodic performance requirements and partial system lineups for operational requirements.
- 1.2.2 Determine the following:
- Required position of components prior to performance of system lineups if desired position of component(s) is other than position specified on System Lineup Checklist (Checklist)
 - Repositioning of components found to be out of the specified position
 - Requirement for performance of a full or partial system lineup based on the level of control that has been maintained over the status of the components
 - Components to be checked when performing a partial system lineup
- 1.2.3 Review completed Checklists for proper completion.

1.2.4 Validate the completion of Checklists by signature and file the completed system lineup in the safe of the cognizant Operations office so that they remain available for review.

1.3 Positioner is responsible for the following:

1.3.1 Initial verification of system component positions.

1.3.2 Positioning components as directed by the FSM/CS to complete the system lineup.

1.4 Independent Verifier is responsible for:

1.4.1 Verification of system component positions, independent of positioner (except throttled components).

2.0 REQUIREMENTS FOR PERFORMING SYSTEM LINEUPS

2.1 A complete system lineup **SHALL** be performed prior to initial operation of a system in accordance with Section 5.0.

2.2 When systems are already in operation, the system lineup **SHALL** be verified when an approved lineup is available in accordance with Section 5.0.

2.3 Periodic full system lineups **SHALL** be performed based on the information recorded in Attachment 3.

2.4 A complete or partial system lineup **SHALL** be performed following maintenance or testing in which valves/switches are not restored to the normal operating position as part of the operating procedure, maintenance/test procedure, or tagout restoration.

2.5 A complete or partial system lineup **SHALL** be performed following a long duration shutdown period or any other time in which the position of components has become suspect.

2.6 The FSM/CS may direct the performance of a partial or complete system lineup when deemed necessary to confirm system configuration.

2.7 System lineups will be performed using only an approved Checklist.

3.0 TECHNIQUES FOR PERFORMING SYSTEM LINEUPS

3.1 General Techniques for Performing System Lineups

3.1.1 If a discrepancy is noted during either initial or subsequent verifications, notify the FSM/CS for resolution.

- 3.1.2 Verifying throttled valve positions by shutting and reopening the valve is to be avoided. When the operation of a throttled valve is necessary to determine the position, the Independent Verifier shall observe the action of the positioner.
 - 3.1.3 The Component Positioner and Independent Verifier should be physically separated. The Independent Verifier shall not rely upon the observed actions of the Positioner to determine the identification, position, or condition of components (except for throttled valves).
 - 3.1.4 Positioner and Independent Verifier shall be aware of the type of valve being verified for application of the proper verification technique.
 - 3.1.5 If remote position indicators are used for verification of component position, a local verification should also be performed.
 - 3.1.6 Independent verification requirements may be waived by the FSM/CS if excessive radiation exposure could result.
 - 3.1.7 Process parameters (such as flow, pressure, or voltage) may be used to verify a component's position at the discretion of the COM. Care should be exercised when using this technique due to alternate flow paths or other operational factors. Using process parameters as the only indication of a component's position should be avoided.
 - 3.1.8 HVAC systems, due to the relative simplicity and the lack of alternate flow paths will be considered properly aligned if the process parameters are in specification and the system appears to be operating normally.
 - 3.1.9 Process Parameters may also be used to verify a valve position when a specific hazard exists to the operator. If extraordinary measures must be employed to reach a valve that is otherwise inaccessible (i.e., extremely tall ladders, etc.) reading a down stream parameter is acceptable if it can be shown that there is no other source of supply.
 - 3.1.10 When process parameters tests are used to verify component position, the FSM/CS shall note the component checked and the method used on the Checklist.
- 3.2 Checking Valves
- 3.2.1 Verify valves that are DANGER tagged to a specific position by noting the position indicated on the tag.

- 3.2.2 Valves that are key-locked in position, for purposes other than DANGER tags, will be verified in the same manner as unlocked valves. The locking device will be removed by the Positioner and reinstalled by the Verifier.
- 3.2.3 Gate and globe valves that are to be verified OPEN will be verified by moving the valve in the CLOSED direction only as necessary to remove any slack from the operating mechanism and to verify valve stem movement. The valve shall then be fully opened.
- 3.2.4 Gate and globe valves that are to be checked CLOSED will be verified by moving the valve in the CLOSED direction only as necessary to verify valve is not binding or difficult to operate.
- 3.2.5 Verify the position of ball valves by observing that the operating lever corresponds to required position as follows:
- Lever parallel to flow - OPEN against physical stop
 - Lever perpendicular to flow - CLOSED against physical stop
- 3.2.6 Verify position of throttled valves without locking devices as follows:
- Check for valve position indicators, scribe marks, or other officially recognized and designated indications if available.
 - If position indicators are not available, manipulate the valve in the CLOSED direction while counting the number of turns required to close the valve fully.
 - Reopen the valve the corresponding number of turns (after removing the slack from the operating mechanism).
- 3.2.7 Verify locked throttled valves by observing indicated position, when provided, or note proper installation of the locking device.
- 3.2.8 Air operated globe valves used at WIPP are normally in a throttling position and are continuously moving to control process parameters. Since these valves cannot be adequately verified, these valves will not be included on the Checklist.
- 3.2.9 Solenoid operated air valves are either fully open or fully closed and have no position indicators. These valves will not be included on the Checklist.

3.3 Valve Operator Clutches

3.3.1 Verify position of clutches by observing the position of the clutch control lever as follows:

- Clutch lever in detent - clutch engaged
- Clutch lever pulled out of detent and rotated 90 degrees - clutch disengaged

3.4 Dampers

3.4.1 Verify position of throttled ventilation dampers by observing indicated position, when provided, or by noting installation of locking device.

3.4.2 Throttled ventilation dampers shall not be operated for verification, unless restoring position following maintenance.

3.5 Circuit Breakers/Switches

3.5.1 Verify circuit breaker position by observing local position indicators.

3.5.2 Verify switch position by observing indicated position on the associated switch label plate and, if available, indicator lights.

3.6 Indicator Lights

3.6.1 Verify that the light is ON or OFF as required.

4.0 DEVELOPING SYSTEM LINEUPS

4.1 COM, perform the following:

4.1.1 Using the guidance found in Attachment 2, determine the need for a system lineup.

4.1.2 Using the guidance found in Attachment 2, determine the need for Independent Verification.

4.1.3 Using the guidance found in Attachment 2, define the technique to be used for independent verification in accordance with Section 3.0.

4.1.4 Using the guidance found in Attachment 2, determine the periodicity for full system lineup performance.

4.1.5 Designate a person SME to develop the new system lineup.

- 4.1.6 Obtain Engineering concurrence for the new system lineup.
- 4.1.7 Review and approve the newly developed system lineup.
- 4.2 SME, perform the following:
 - 4.2.1 Checklist shall be developed utilizing the latest Controlled Document print. Using the controlled print as a guide, list those components in the order they would occur in the field during a system walkdown. Only components that if mispositioned could have a detrimental effect on system performance need to be included on a Checklist.
 - 4.2.2 Enter on the Checklist the component equipment number in the COMPONENT NUMBER BLOCK, or enter "NO NUMBER" in the COMPONENT NUMBER BLOCK if the component has no assigned number by the controlled print.
 - 4.2.3 Enter a brief description of the component in the DESCRIPTION BLOCK.
 - 4.2.4 List the position of the component as it would be during normal operation of the system in the NORMAL POSITION BLOCK.
 - 4.2.5 List throttled components as "THROTTLED" or "LOCKED THROTTLED" unless a specific throttled position is required. If the lineup requires checking of the specific position, enter the number of turns or the percentage open.
 - 4.2.6 List the drawings that will assist the positioner and independent verifier in the REFERENCE DRAWINGS block.
- 5.0 PERFORMING A COMPLETE SYSTEM LINEUP
 - 5.1 FSM/CS, perform the following:
 - 5.1.1 Make a copy of the desired attachment from this instruction.
 - 5.1.2 Indicate "Verified Correct Copy" on the front page with a signature.
 - 5.1.3 Review the Checklist for appropriate component position in regard to the current operating status of the equipment.

- 5.1.4 If the NORMAL POSITION indicated on the Checklist is not appropriate for the current operating conditions, perform the following:
- Enter the correct position in the DESIRED POSITION block.
 - Initial the entry.
 - If preparing a partial system lineup, mark N/A at the top of the page for those items not being checked, and draw a straight line down the page, leaving a blank for only those components that will be positioned. Initial each entry.
 - If no Independent verifier is required, mark N/A on the first page in the INDEPENDENT VERIFIER block and initial the entry.
 - Assign certified operators to perform as Component Positioner and Independent Verifier.

5.2 Positioner, perform the following:

- 5.2.1 Enter the date the lineup is started on each page of the Checklist, as the Checklist is performed.
- 5.2.2 Verify the label plate on the component being checked matches that listed in the COMPONENT NUMBER block.
- 5.2.3 Verify that each component position is as listed on the Checklist by using the techniques listed in Section 3.0.
- 5.2.4 Indicate verification by initialing POSIT (Positioner) block.
- 5.2.5 If a component is found out of the expected position, stop the lineup and inform the FSM/CS. **DO NOT** change component position without specific guidance and concurrence from the supervisor.
- 5.2.6 Print your name on the cover sheet in the POSITIONER block and enter your initials in the INITIALS block.
- 5.2.7 Enter any comments in the COMMENTS block.

5.3 Independent Verifier, perform the following:

- 5.3.1 Verify that each component position is as listed on the Checklist by using the techniques listed in Section 3.0.
- 5.3.2 Indicate verification by initialing VERIF (Verifier) block.

- 5.3.3 Enter the date on the front page of the Checklist when the last verification is complete.
- 5.3.4 Print your name on the cover sheet in the VERIFIER block and enter your initials in the INITIALS block.
- 5.3.5 Enter any comments in the COMMENTS block.

6.0 RECORDS

- 6.1 COM, validate the Fault Tree Analysis results and turn them over to the RIDS Coordinator for proper disposition.

NOTE

The previous completed full Checklist shall be turned over to the RIDS coordinator for proper disposition. Only the most recently completed full Checklist will be kept on file for review.

- 6.2 FSM/CS, validate the most recently completed full Checklist and file it in the cognizant Operations office safe.
- 6.3 If completing a partial Checklist, file it in the safe along with any previously completed partial Checklists. Leave all partial Checklists in the safe until a full system lineup is accomplished and on file.

Attachment 1 - Fault Tree Analysis

SYSTEM _____

Page 1 of _____

Fault Tree Analysis

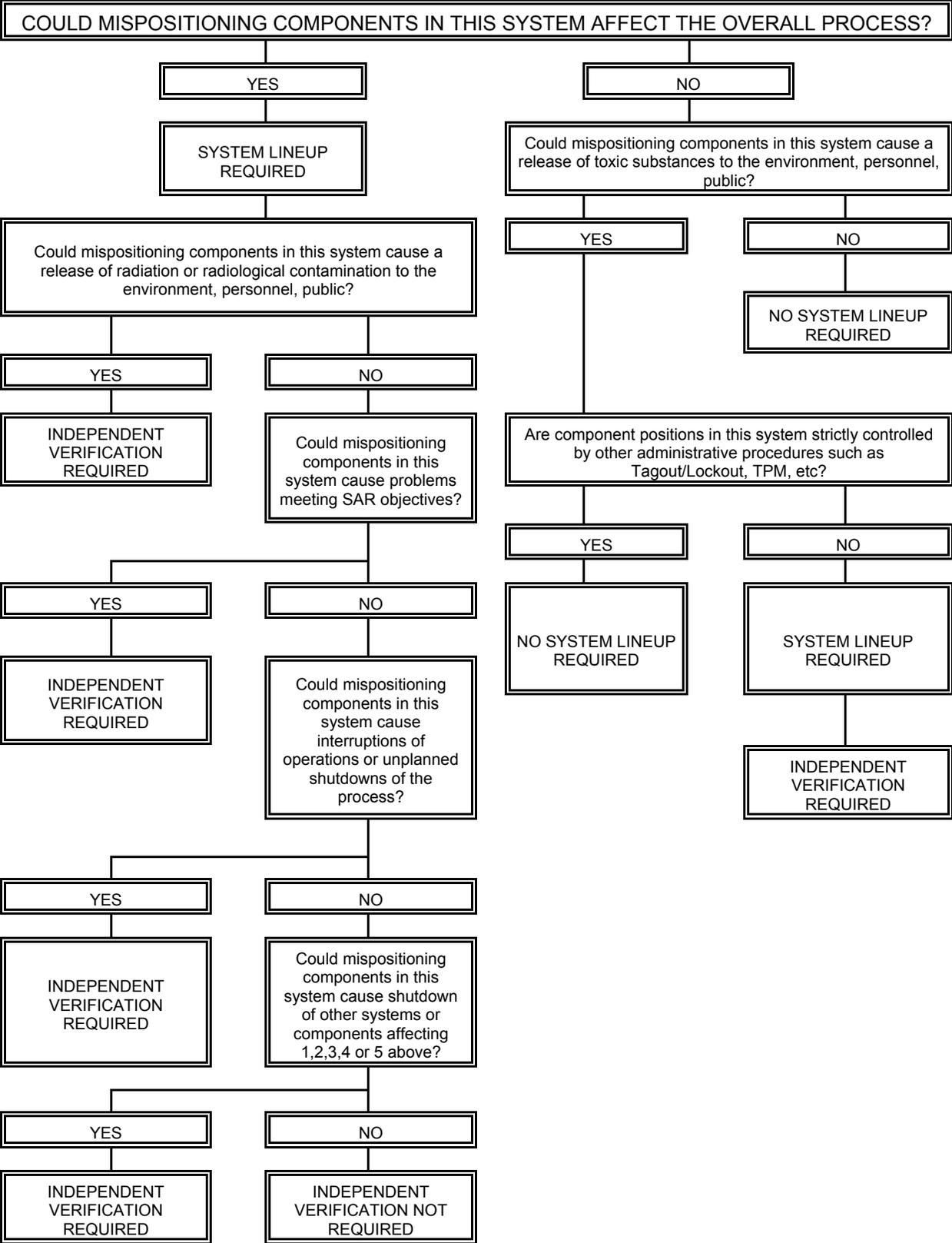
The following guidelines will be used by the Surface Operations/Maintenance Manager (SOMM) for determining if a system lineup is required. If a system lineup is required, is there a need for Independent Verification?

1. Could mispositioning components in this system affect the overall process?
2. Could mispositioning components in this system cause a release of a toxic substance to the environment, personnel, or public?
3. Could mispositioning components in this system cause a release of radiation or radiological contamination to the environment, personnel, or public?
4. Could mispositioning components in this system cause problems meeting technical safety requirement objectives?
5. Could mispositioning components in this system cause interruptions of operations or unplanned shutdowns of the process?
6. Could mispositioning components in this system cause shutdown of other systems or components affecting 1, 2, 3, 4, or 5 above?
7. Are component positions in this system strictly controlled by other administrative procedures such as tag-out/lock-out, temporary plant modification etc.?
8. Is Independent Verification required?
9. Define technique(s) to satisfy Independent Verification.
10. Define periodicity.

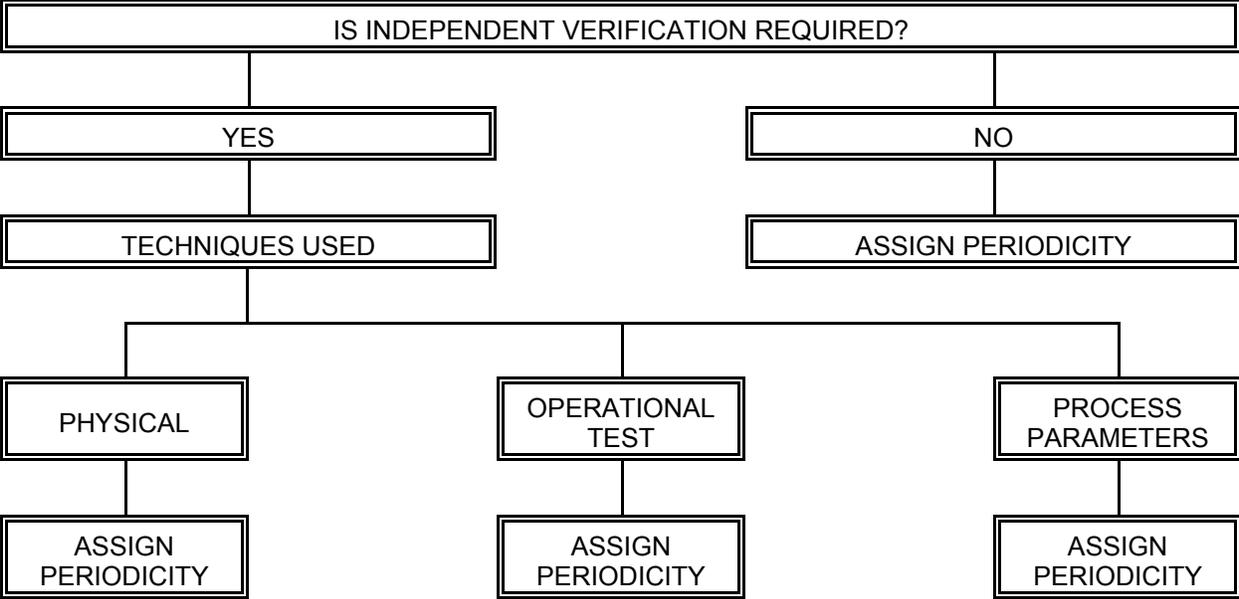
COM VALIDATION _____

DATE _____

Attachment 2 - Objectives for Fault Tree Analysis



Attachment 2 - Objectives for Fault Tree Analysis



Attachment 3 - System Lineup Index

SYSTEM LINEUP INDEX

Attachment Number	System Title	System Lineup Required	Independent Verification Required	Full Lineup Required
X	(CA01) PLANT AIR SYSTEM	NO	NO	NO
3	(CA02) INSTRUMENT AIR SYSTEM	YES	YES	1 YR
3	(CA03) U/G PLANT AIR SYSTEM	YES	YES	1 YR
X	(CM01) CENTRAL MONITORING SYSTEM	NO	NO	NO
X	(CW01) COOLING WATER SYSTEM	NO	NO	NO
X	(CW02) CHILLED WATER SYSTEM	NO	NO	NO
X	(ED04) ELECTRICAL SUBSTATIONS SYSTEM	NO	NO	NO
X	(ED08) MAIN UPS SYSTEM	NO	NO	NO
3	(ED09) DIESEL GENERATOR SYSTEM	YES	YES NOTE 1	MONTHLY NOTE 2
X	(ED10) U/G ELECTRICAL SYSTEM	NO	NO	NO
3	(FP01) FIRE WATER SYSTEM	YES	YES	3 YR
X	(GC03) SEWAGE LAGOON SYSTEM	NO	NO	NO
3	(HV01) BUILDING 411 CH-AREA HVAC SYS	YES	YES	1 YR
3	(HV02) BUILDING 411 RH-AREA HVAC SYS	YES	YES	1 YR
3	(HV03) BUILDING 451 ZONE 6 HVAC SYS	YES	YES	1 YR
3	(HV04) BUILDING 413 HVAC SYSTEM	YES	YES	1 YR
X	(HV05) BUILDINGS 452, 453, 456 SYS	NO	NO	NO
X	(HV06) MISC. OUT BUILDINGS SYS	NO	NO	NO

Attachment 3 - System Lineup Index

SYSTEM LINEUP INDEX

Attachment Number	System Title	System Lineup Required	Independent Verification Required	Full Lineup Required
X	(PV00) PLANT VACUUM SYSTEM	NO	NO	NO
3	(VU01) U/G VENTILATION AND FILTRATION	YES	YES NOTE 3	MONTHLY NOTE 4
X	(VU02) U/G BOOSTER FAN SYSTEM	NO	NO	NO
3	(VU03) VENTILATION CONTROL DEVICES (U/G BULKHEAD DOORS SYSTEM	YES	YES	1 YR
X	(WD01) DOMESTIC/UTILITY WATER SYSTEM	NO	NO	NO
X	(WD02) RAW WATER, TANKS, AND CHLORINE	NO	NO	NO
X	(UH06) WASTE HOIST	YES	YES Note 5	YES Note 6
X	(UH04) SALT HOIST	YES	YES Note 5	YES Note 6
X	(UH02) AIR INTAKE HOIST	YES	YES Note 5	YES Note 6
X	(WH02) TRUDOCKER VACUUM/VENTILATION SYSTEM	YES	YES Note 7	NO

NOTES

- NOTE 1 - The Independent Verification is satisfied by a monthly Operational Check of the Diesel Generator.
- NOTE 2 - The periodic System Lineup is satisfied by the monthly Operational Check of the Diesel Generator.
- NOTE 3 - The Independent Verification is satisfied by a monthly Operational check of the Filtration System.
- NOTE 4 - The periodic System Lineup is satisfied by the monthly Operational check of the Filtration System.
- NOTE 5 - The System Lineup is satisfied by daily Operational check of all Hoisting Systems (Waste Hoist, Salt Hoist, and Air Intake Hoist).
- NOTE 6 - The Independent Verification is satisfied by daily Operational check of all Hoisting Systems (Waste Hoist, Salt Hoist, and Air Intake Hoist).
- NOTE 7 - The Independent Verification is satisfied by the Preoperational Inspection for the respective system being used.

Attachment 4 - Sample System Lineup Checklist

SYSTEM: _____ PAGE 1 OF _____

DATE STARTED: ____ / ____ / ____ DATE COMPLETED: ____ / ____ / ____

POSITIONER: _____ INITIALS: _____

PRINTED NAME

VERIFIER: _____ INITIALS: _____

PRINTED NAME

POSITIONER: _____ INITIALS: _____

PRINTED NAME

VERIFIER: _____ INITIALS: _____

PRINTED NAME

SYSTEM LINEUP CHECKLIST CONCURRENCE _____

COGNIZANT ENGINEER

SYSTEM LINEUP CHECKLIST APPROVED _____

COGNIZANT OPERATIONS MANAGER

COMMENTS:

FSM/COGNIZANT SUPERVISOR VALIDATION: Completion of this step constitutes validation of this record.

Print Name

Signature

Date

Attachment 5 - Definitions

- SYSTEM LINEUP - The specific and documented configuration of components of a system or piece of equipment in accordance with design specifications and operational requirements.
- VERIFICATION - The act of ensuring a condition (such as a component position) conforms to specified requirements.
- INDEPENDENT VERIFICATION - The act of ensuring a condition (such as a component position) conforms to specified requirements after the initial verification by a different operator.
 - In some situations, a component's position can be determined by observing such process parameters as flow, pressure, or voltage. The observation of process parameters can constitute an independent verification--Instructions will specify where and when process parameters are acceptable indicators of component position.
 - In some cases, surveillance testings may be substituted for normal verification techniques. The test must conclusively prove the position of the component being verified.
- LOCKED THROTTLED - A designation for throttled valves and ventilation dampers in systems that (1) have been mechanically secured in a required position during system flow balancing; and (2) control essential system operating parameters.