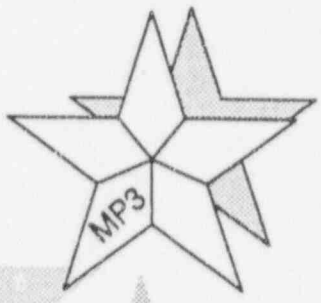
NORTHEAST UTILITIES NUCLEAR
PROJECT INSTRUCTION



STOP THINK ACT REVIEW

Millstone Unit 3 Walkdowns

NUC PI 4

Rev. 1

This Project Instruction (PI) is part of implementation of the Configuration Management Plan (CMP).

Approval: _____

PORC Mtg. No: 3-96-105 Date: 5-24-96

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Level of Use
Information

Responsible Individual:
T. Paulantonio
Subject Matter Expert:
T. Paulantonio

Millstone Unit 3 Walkdowns

TABLE OF CONTENTS

1. INSTRUCTIONS

The intent of this Project Instruction is to perform the following for each Group 1 system identified in the "Millstone Unit 3 CMP Implementation Plan" attachment to the CMP:

- Walkdowns of selected PDCRs (Refer To Attachment 1)
- System walkdowns for housekeeping and materiel condition (Refer To Attachment 2)
- System walkdowns to verify selected design basis attributes and inspection criteria provided by NUC PI 15, "Selected Millstone Unit 3 System Reviews" (Refer To Attachment 3)

This PI provides guidance for performing consistent and comprehensive visual inspections of systems and surrounding areas required by the CMP for materiel condition to provide the following:

- Discovery of discrepancies
- Resolution of discrepancies

This PI provides guidance on the attributes to be investigated during the walkdown process and the documents necessary to record the walkdown results. As applicable, the system attributes prepared in NUC PI 7, "Graded System Reviews," and/or NUC PI 15 should be utilized in the walkdowns.

Certain conditions may restrict accessibility for inspection. Consideration should be given to ALARA issues, safety, and plant conditions. Incomplete inspections due to restricted accessibility are documented in the Final System Readiness Report.

1.1 Establishing Walkdown Teams

NOTE

Training for this PI will be conducted concurrent with training for NUC PI 5, "System Readiness Review," for Millstone Unit 3.

SRT Leader

1.1.1 ASSEMBLE walkdown team that typically includes the following:

- System Review Team (SRT) Leader
- Design Engineer
- Designer (as needed)
- Maintenance and Operations personnel (as needed)

NOTE

The SRT Leader and Design Engineer have completed initial engineering qualifications. Based upon their current job description and assigned duties and responsibilities, they are generally qualified to perform system readiness and PDCR installation walkdowns. Specific training in the CMP Walkdown Process will ensure their ability to meet PI objectives. Other team members, as assigned, require only those skill sets related to their specific job descriptions.

UPM

1.1.2 VERIFY walkdown team is trained and qualified in those skill sets related to their specific job descriptions for this PI.

System Review Administrative (SRA) group

1.1.3 MAINTAIN records of qualification status.

1.2 Walkdown Process

This section outlines the general approach to the walkdown process. Inspection items to be addressed throughout walkdowns are contained in Attachment 1, Attachment 2, and Attachment 3.

SRT Leader

1.2.1 DETERMINE approach to be used to perform walkdown, either:

- Focus on where to start walkdown, considering major system components and (if applicable) long-standing issues.
- Entire Walkdown Team performs preliminary walkdown to identify discrepancies.
- Smaller groups within the Walkdown Team perform a series of walkdowns, with each walkdown having a particular focus.

NOTE

Only accessible portions of the system are walked down, giving consideration to ALARA issues, safety, and plant conditions.

1.2.2 EXAMINE as-built condition of assigned systems, structures, or components.

1.2.3 DOCUMENT results of each walkdown (including any access restrictions or other issues impacting the inspection, or any deficiencies noted) on applicable form as specified in step 1.3.1:

- IF a PDCR: Attachment 1
- IF housekeeping/materiel condition: Attachment 2
- IF an NUC PI 15 design basis walkdown: Attachment 3

1.2.4 REVIEW walkdown findings.

a. IF any discrepancies are identified, Refer To Section 1.4 for processing.

1.2.5 FORWARD copies of all walkdown attachments and Unresolved Item Reports (UIRs) (from NUC PI 5, "Millstone Unit 3 System Readiness Review") to the System Review Administrative (SRA) group.

SRA

1.2.6 RETURN each completed Attachment 3 to the "Vertical Slice" Team for review.

1.2.7 FILE walkdown attachments in System Readiness file.

1.3 Inspection Items

NOTE

1. For the purposes of this PI, any inspection item marked "Unsat" or "N/I" is treated as a discrepancy.
2. Reasons recorded in the "Notes" section for discrepancies are "keyed" to the inspection item by noting the inspection category designator, followed by the specific item number. **Example:** On Attachment 1, a pump seal or packing discrepancy is coded "C3," and a specific reason for "Unsat" or "N/I" status is recorded.

Walkdown Team

1.3.1 Throughout performance of this section, DOCUMENT inspection results on the applicable attachment as follows:

- IF no discrepancy is noted, CHECK "SAT."
- IF a discrepancy is noted, PERFORM the following:
  - CHECK "UNSAT."
  - Refer To NUC PI 5, "System Readiness Review," and COMPLETE Block 1 of UIR.
- IF inspection item does *not* apply to the inspection in progress, CHECK "N/A."
- IF inspection item is *not* accessible, CHECK "N/I" and PROVIDE information in the "Notes" section about the reason for not inspecting the item.

NOTE

For PDCRs, only those attributes of Attachment 1 that apply to a specific PDCR will be walked down.

SRT Leader

1.3.2 Refer To Attachment 1 and PLACE a check mark in the 'R' column next to each **PDCR inspection** item to be inspected.

Walkdown Team

1.3.3 INSPECT identified **PDCR inspection** items and MARK results of inspection on Attachment 1 as outlined in step 1.3.1.

NOTE

1. Inspections may be performed in any order.
2. Poor housekeeping may lead to loss of Foreign Material Exclusion (FME) control.
3. Some "general housekeeping" issues are also safety or fire hazard issues.
4. Poor materiel condition may be symptomatic of more severe problems.

1.3.4 INSPECT the **general housekeeping** of the area and MARK the results of inspection on Attachment 2 as outlined in step 1.3.1 for any problems, including the following:

- Cleanliness issues (debris, contamination, spills, etc.)
- Storage of materials or tools (inappropriate, inadequate, etc.)

NOTE

Steps 1.3.5 through 1.3.10 provide additional inspection attributes which may be considered by the Walkdown Team during their materiel condition or housekeeping walkdowns.

1.3.5 INSPECT the **materiel condition** of the area and MARK the results of inspection on Attachment 2 as outlined in step 1.3.1 for problems in any of the following areas:

- Component identification (signs or labels missing, incorrect, out of date, or unreadable, etc.)
- Painted surfaces (wearing thin, flaking, rusted, areas or components not painted, etc.)
- Covers (component or drain covers not in place, etc.)
- Bearing housings for pumps and motors (abnormal sounds, smells, or temperature; vibration to the touch, etc.)

NOTE

Leak detection may be accomplished using any of the following:

- Visual: drips, puddles, stains, boron deposits
- Temperature: touch or pyrometer
- Audible: stethoscope (if needed)

- Seal integrity (leaks of any kind: packing, stem, seal, flange, pipe, seat, body–to–bonnet, etc.)
- Lubrication (improper level, detected using sight glass, bull's eye, flow indicator, dip stick, grease cup, valve stem, etc.)
- Valve condition (bent stem, bottomed or corroded packing gland, engagement of fasteners, abnormal flow noise, etc.)
- Handwheel or operator condition (broken; missing key, setscrew, or pin, etc.)
- Dampers (linkages bent, broken or disconnected; cleaning or adjustment required, etc.)
- Filters, screens, louvers (plugged, missing, dirty, loose, etc.)
- Fan belts (loose, protective covers loose or missing, wear dust on sheaves or guard, etc.)

- Gauges or instruments (inoperable, out of calibration, physical damage, inconsistent readings, etc.)
- Instrument sensing lines (damaged, crimped, disconnected, etc.)
- Drains (plugged, screens or grates missing, etc.)
- Piping (loose, damaged, missing, insulation damaged or missing, hangers disconnected or missing, heat tracing damaged, etc.)
- Heat transfer (surfaces dirty or fouled, etc.)
- Environmental qualification (boundaries disturbed, etc.)
- Area lighting (insufficient, blown bulbs, etc.)
- Indicating lamps (missing, burned out, covers missing, improper indication for known conditions, improper labels, etc.)
- Electrical control panels (covers missing, open or unlatched doors, pinched wires, foreign material, water or moisture noted, missing bolts, abnormal sounds or smells, etc.)
- Cables or leads (unsecured, worn, frayed or cut insulation, loose terminations, potential heat damage, cables hanging outside of cable tray, improper electrical train separation, etc.)
- Motors or generators (excessive noise or vibration, dirty armature or windings, ground straps loose or disconnected, etc.)
- Preservation of equipment (excessive rust, material wastage, impact of surrounding conditions, etc.)
- Equipment skid or foundation bolting (loose or missing, etc.)
- Record attached TR tags and forward information to WP&OM
- Modifications (temporary alterations not on drawing, partial modifications, unauthorized modifications, etc.)
- Chemicals (unauthorized use, improper storage, etc.)
- Components fabricated from elastomers or otherwise subject to aging (for signs of degradation)

NOTE

Safety and fire hazard inspections are for both personnel safety issues and plant safety issues. Some "general housekeeping" issues are also safety or fire hazard issues.

1.3.6 INSPECT the area for **safety or fire hazards** and MARK the results of inspection on Attachment 2 as outlined in step 1.3.1 for problems in any of the following areas:

- Doors or hardware (broken, loose, or missing; etc.)
- Fire or flood barriers (inappropriate breaches, etc.)
- Grounding devices (broken, loose, or missing; etc.)
- Equipment guards (broken, loose, or missing; etc.)
- Extraneous trash or material (stored in areas not reserved or suitable for storage, untreated lumber or other fire hazard, etc.)
- Storage lockers (not clean, neat or properly restrained, etc., as defined in Attachment 4)
- Floor drains or sumps (dirty or plugged, etc.)
- Temporary equipment such as hoses, extension cords, ladders, or gas bottles (present but not in use)
- Neatness of piping, supports, or walls (tape or other foreign material present, etc.)
- Pathways or stairwells (obstructed, tripping or fall hazard, etc.)
- Eyewash stations, emergency showers, and fire extinguishers (*not* accessible, not operational, not properly charged, etc.)
- Insulation or lagging (missing or not in good condition, crushed, damaged, etc.)

1.3.7 INSPECT the area for **damage** and MARK the results of inspection on Attachment 2 as outlined in step 1.3.1 for problems in any of the following areas:

- Thermal insulation (missing or not in good condition, crushed, damaged, etc.)
- Hangers (bent or broken, etc.)
- Equipment anchorage (stressed or loose, etc.)
- Piping (excess motion or vibration; evidence of water hammer, water slugs, or other severe transients, such as damaged supports, pulled out concrete anchors, bent or deformed components, or unusual noise; etc.)
- Tubing or conduit (damaged, etc.)
- Area or component general condition (unusual noises, excessive vibration, excessive temperature, relay chatter, discolored fluids, arc paths, etc.)
- Valves (indications of flow through closed valves, external leakage of fluids, etc.)

1.3.8 INSPECT general condition of **piping** and MARK the results of inspection on Attachment 2 as outlined in step 1.3.1 for problems in any of the following areas:

- Valve operation (cycling or chattering, cavitation noise, etc.)
- Location relative to other components (interference with other components, impact of vibration of equipment to which pipe is attached, etc.)
- Piping integrity (excessive motion, leaks, evidence of rubbing or external corrosion causing wall loss, etc.)

1.3.9 INSPECT general condition of **pipe supports** and MARK the results of inspection on Attachment 2 as outlined in step 1.3.1 for problems in any of the following areas:

- General condition of supports, with problem areas including (but not limited to):
  - Excessive motion
  - Degradation of fasteners, springs, clamps, or other components; dented, cracked, broken, or out of adjustment components; etc.
  - Missing, detached, or loose components
  - Indications of scaling that may reduce the load bearing capacity of the support
  - Arc strikes, weld splatter, paint, scoring, roughness, or general corrosion on close tolerance machined or sliding surfaces
  - Unusual concrete or grout deterioration (such as erosion, corrosion, chipping, cracking, or spalling)

NOTE

Electrical motors, heaters, panels, and breakers are inspected for proper installation and to detect conditions that may lead to equipment or personnel damage.

1.3.10 INSPECT general condition of **electrical equipment** and MARK the results of inspection on Attachment 2 as outlined in step 1.3.1 for problems in any of the following areas:

- Conduit, panel, and junction box covers (*not* properly in place or *not* capable of providing normal access)
- Cable trays and covers (missing covers)
- Local panel and floor penetrations (*not* properly sealed as required)
- Local instruments and indicators (damaged or *not* in service)
- HVAC belts or motors (excessively noisy); fan coils and motor intakes (dirty)
- Wire insulation (damaged)
- Motor air intakes (clogged or obstructed)

1.4 Discrepancies

SRT Leader

1.4.1 REVIEW walkdown results and GENERATE UIRs.

1.4.2 IF required, Refer To RP-4, "Adverse Condition Resolution Program," and INITIATE an ACR for each applicable discrepancy that may affect operability or reportability.

1.4.3 DEVELOP recommended resolution for UIR as specified in PI 5.

1.4.4 REVIEW walkdown results and generated UIRs with the Coordinator, SRT.

1.4.5 FORWARD reviewed UIRs to the SRA.

SRA

1.4.6 ASSEMBLE walkdown UIRs for inclusion in Preliminary Readiness Report as specified in PI 5.

1.4.7 FILE original UIRs in the System Readiness file.

2. REFERENCES

2.1 Configuration Management Plan (CMP)

2.2 RP–4, "Adverse Condition Resolution Program"

2.3 System Engineer Handbook Section 6.4, "Walkdown Guidelines"

2.4 NUC PI 5, "System Readiness Review"

2.5 NUC PI 7, "Graded System Reviews"

2.6 NUC PI 15, "Selected Millstone Unit 3 System Reviews"

2.7 NUC PI 16, "Licensing Basis and Design Bases Walkdowns"

3. COMMITMENTS

None

4. SUMMARY OF CHANGES

4.1 Added numbers to Attachment 1 for consistency with NUC PI 16 Attachments.

4.2 Added NOTES before step 1.3.1 for consistency with NUC PI 16.

4.3 Added amplifications and corrections of original information based on procedure use.

Attachment 1
PDCR Walkdown Checklist

(Sheet 1 of 4)

Design Document # _____ Date: _____

System # _____ Time: _____

R	Item	Sat	Unsat	N/A	N/I
A	**All Equipment:**				
	1. Labeling and component identification installed and correct.				
	2. Equipment covers and safety guards installed.				
	3. As appropriate, equipment operation access platforms are installed.				
	4. Manufacturer's equipment tags and name plates installed and legible.				
	5. Bolting tight with proper hardware installed.				
	6. General component installation per design drawings.				
	7. Components installed in a manner that provides access for operation and maintenance, and does not present a personnel safety hazard.				
	8. Existing components, systems, or structures undamaged.				
	9. Construction debris removed and proper cleanliness level established.				
B	**Valves:**				
	1. Valve glands and packing installed.				
	2. Live load packing adjusted per manufacturer's recommendations.				
	3. Pressure relief/safety valve/rupture disks settings per design (as indicated on attached valve tags).				
	4. Pressure relief/safety valve/rupture disks discharge piping properly secured and discharge flow is directed in a safe manner.				
	5. Valve orientation correct (including check valves and non-return valves).				
	6. Valve hand wheels installed.				
	7. Manual valves have sufficient clearance to be operated.				
	8. Locking device provided for those valves/breakers/ switches required to be locked in a certain position.				
	9. Valves have manufacturer's labels and/or tags installed.				
	10. Solenoid valves installed with correct porting.				
	11. Solenoid valves have proper voltage rating.				

* R = Required Sat: Satisfactory N/A: Not Applicable Unsat: Unsatisfactory N/I: Not Inspectable

Notes:

Attachment 1
PDCR Walkdown Checklist
(Sheet 2 of 4)

R	Item	Sat	Unsat	N/A	N/I
C	**Pumps, Fans, Compressors:**				
	1. Pumps, fans, compressors aligned and coupled, and coupling guards installed.				
	2. Pumps and fans oriented correctly.				
	3. Pump seals and packing installed.				
	4. Pump seal/bearing cooling lines installed.				
	5. Pump seal leakoff lines or baseplate drain lines installed.				
D	**Mounting and Supports:**				
	1. Equipment mounting bolts installed and tight.				
	2. As required, equipment base plate grouted.				
	3. Bolts and concrete anchors have thread engagement per design requirements.				
	4. Pipe hangers, conduit supports, cable tray supports, and instrument line supports installed per design requirements.				
	5. Support and hanger accessories installed per design requirements. (clips, U-bolts, etc.)				
	6. Snubbers installed per design requirements and setpoints verified.				
	7. Hanger spring cans installed and adjusted per design requirements.				
	8. Adjustable struts installed and adjusted per design requirements.				
	9. Seismic anchors and restraints installed per design requirements.				
	10. Temporary supports removed.				
E	**Instrument:**				
	1. Instrument sensing lines connected per design requirements and are tight.				
	2. Equipment mounted instrumentation installed per design requirements.				
	3. Physical protection for instrumentation installed per design requirements.				
	4. Instrument tubing and fittings installed per design requirements.				
	5. Surge suppressors for instrumentation installed per design requirements.				

R = Required Sat: Satisfactory N/A: Not Applicable Unsat: Unsatisfactory N/I: Not Inspectable
Notes:

Attachment 1
PDCR Walkdown Checklist

(Sheet 3 of 4)

R	Item	Sat	Unsat	N/A	N/I
F	**Electrical Equipment:**				
	1. Electrical Environmental Qualification (EEQ) related equipment installed per Design requirements.				
	2. Electrical equipment, raceway, and cable installed to Electrical Design Requirements (e.g., for MP3 Standard Electrical Installation Specification SP–ST–33–076)				
	3. Electrical connections made up and tight.				
	4. Panel wiring neat and orderly.				
	5. Conductor identification tags installed.				
	6. Train separation per design requirements.				
	7. Cable tray wiring neat and orderly.				
	8. Permanently lifted or abandoned lead have been marked and documented.				
	9. Mechanical protective devices for electrical conductors installed per design requirements.				
G	**Heat Tracing, Insulation, Painting:**				
	1. Heat tracing installed per design requirements.				
	2. Painting and other protective surface coatings satisfactorily installed.				
	3. Insulation installed per design requirements.				
H	**HVAC Equipment:**				
	1. Ventilation system filters and absorber units installed and properly oriented.				
	2. Fire dampers properly oriented and installed.				
	3. Fusible links installed and are of the proper temperature range.				
	4. Ductwork access doors installed.				
	5. Equipment condensation drains installed.				

R = Required Sat: Satisfactory N/A: Not Applicable Unsat: Unsatisfactory N/I: Not Inspectable

Notes:

Attachment 1
PDCR Walkdown Checklist

(Sheet 4 of 4)

R	Item	Sat	Unsat	N/A	N/I
I	**Piping:**				
	1. Restricting orifices and flow elements installed.				
	2. Flow elements oriented correctly.				
	3. Fluid system permanent filters installed.				
	4. Startup filters or strainers installed and identified.				
	5. Permanent piping spool pieces (to replace startup filters or strainers) are available for installation.				
	6. Original material/weld identification numbers are legible.				
	7. Welding dams or purge paper used during piping installation removed or identified (so they can be removed after turnover).				
	8. Temporary vent paths used for welding (i.e., valve bonnet or check valve intervals removed) have been restored.				
	9. Fire barriers, cable tray separators and covers, and other fire protection features/equipment installed per Design requirements.				
	10. Security barriers and other physical security measures properly installed. These attributes to be verified during walkdown by a representative of the Station Security Department.				
J	**Lubrication**				
	1. Lubrication reservoirs installed and at proper operating level.				
	2. Equipment properly lubricated and lubrication records available.				
K	**Cathodic Protection**				
	1. Cathodic protection installed per design requirements.				
	2. Insulating flanges installed per design requirements.				

* Sat: Satisfactory N/A: Not Applicable Unsat: Unsatisfactory N/I: Not Inspectable

Notes:

Walkdown Participants:

_____ _____ _____ _____

_____ _____ _____ _____

_____ _____ _____ _____

SRT Leader: _____ Date: _____

Supervisor: _____ Date: _____

Attachment 2
Materiel Condition/Housekeeping Walkdown Checklist

(Sheet 1 of 2)

System # _____ Date: _____

Area: _____ Time: _____

Item	Sat	Unsat	N/A	N/I
1. Lagging/insulation				
2. Tags/labels				
3. Dirt/dust/debris				
4. Tubing (tight, supported)				
5. Leaks (oil/water/boric acid)				
6. TR tags				
7. Abandoned equipment				
8. Room temp/humidity/quality				
9. Ventilation (dust)				
10. Concrete (spalling/cracks)				
11. Drains (blocked/dirty)				
12. Lighting				
13. Painting (rust/wear)				
14. Holes in walls & floors				
15. Abandoned cables				
16. Cables coiled				
17. Grounding wires				
18. Conduit damage				
19. Hanger/supports/installation				

* Sat: Satisfactory N/A: Not Applicable Unsat: Unsatisfactory N/I: Not Inspectable

Notes:

Attachment 2
Materiel Condition/Housekeeping Walkdown Checklist

(Sheet 2 of 2)

Item	Sat	Unsat	N/A	N/I
20. Safety equipment (fire, eye wash, ladders)				
21. General equipment arrangement (professional/sloppy work)				
22. Erosion				
23. Corrosion				
24. Overloads				
25. Excessive vibration				
26. Fatigue				
27. Work environment				
28. Safety hazards				
29. Cleanliness/housekeeping				
30. Improper use of tape, restraints or barriers				
31. Physical obstructions affecting operability				

* Sat: Satisfactory N/A: Not Applicable Unsat: Unsatisfactory N/I: Not Inspectable
Notes:

Walkdown Participants:

_____ _____ _____ _____

_____ _____ _____ _____

_____ _____ _____ _____

SRT Leader: _____ Date: _____

Supervisor: _____ Date: _____

Attachment 3
VSRT Walkdown Checklist (From NUC PI 15)

(Sheet 1 of 1)

Design Document # _____ Date: _____

System # _____ Time: _____

Item #	Item	Sat	Unsat	N/A	N/I

* Sat: Satisfactory N/A: Not Applicable Unsat: Unsatisfactory N/I: Not Inspectable

Notes:

Walkdown Participants:

_____ _____ _____ _____

_____ _____ _____ _____

_____ _____ _____ _____

SRT Leader: _____ Date: _____

Supervisor: _____ Date: _____

Level of Use
Information

STOP THINK ACT REVIEW

Attachment 4
Guidelines for Identifying Potential Seismic Interaction of Temporary Equipment and Proper Locations for Restraints

(Sheet 1 of 1)

Type of Item	Recommended Location of Restraint
Ladders, Gas Cylinders (tall, slender, free–standing items)	• If greater than 4 ft. in height, use two restraints positioned at intervals approx. 1/3 the height. • If less than 4 ft in height, use single restraint positioned at approx. center of gravity.
Storage Lockers, Tool Boxes, Desks (unanchored item roughly box type shape height is greater than base dimensions)	• Provide one restraint at approx. center of gravity. • Or provide hard anchorage at item's base.
Storage Lockers, Tool Boxes, Desks (unanchored item roughly box type shape height is less than base dimensions)	• Provide one restraint at approx. center of gravity. • Or provide hard anchorage at item's base.
Rolling Carts, Dollys, Wheeled Test Equipment, Wheeled Storage Lockers, etc. (unanchored items on wheels or round shaped items capable of rolling)	• Lock Wheels or provide wheel chocks or travel stops to prevent uncontrolled rolling. • Or (if restraints are used), use two and restrain in opposite directions to prevent walking on radius of restraint. • Also consider potential for toppling and sliding conditions, as described above.
Portable Jib Cranes or Rotating Booms (items with unsecured components which are pendulum hung or pinned)	• Secure the component to prevent swinging.