



1.0

PURPOSE

This procedure provides the requirements and instructions for maintaining system piping to the required cleanliness classification and to perform all maintenance activities in compliance with applicable housekeeping zones.

## NOTES

- FOR INFO ONLY
- a. This procedure does not cover cleanliness routines of flushing, acid, or alkaline cleaning. These maintenance cleanliness activities will be covered by specific instructions as required.
  - b. This procedure does not cover the housekeeping responsibilities of the building and grounds supervisor.
  - c. This procedure makes the highest level of maintenance cleanliness and housekeeping requirement the most restrictive, and automatically includes the other lower levels of maintenance cleanliness and housekeeping requirements under it.

2.0

PRECAUTIONS AND LIMITATIONS

2.1

Observe Safety Rules outlined in Georgia Power Company, SAFETY, Section "O".

2.2

Observe radiation protection procedures:

2.2.1

To limit personnel exposure to radiation and radioactive contamination

2.2.2

To prevent the spread of such contamination.

2.3

Be alert for conditional changes that might effect the requirements for additional radiation protection (example: As an open pump casing dries out airborne contamination may become an increasing factor).

3.0

PREREQUISITES AND INITIAL CONDITIONS

N/A

4.0 GENERAL MAINTENANCE CLEANLINESS-AND HOUSEKEEPING OPERATIONS

- 4.1 The following general maintenance cleanliness and housekeeping operations shall apply to all maintenance activities at all times:
- 4.1.1 Work areas shall be kept sufficiently clean and orderly to ensure that maintenance activities can be performed in a safe and efficient manner and that the quality of the maintenance activities will not be adversely affected.
- 4.1.2 Garbage, trash, scrap, litter, and other excess materials shall be periodically removed from areas where maintenance activities are being performed and shall not accumulate and create conditions that can adversely affect quality.
- 4.1.3 The use, location, and deployment of tools used in the performance of maintenance activities shall be regulated to keep access and work areas clear. This shall include, but is not limited to, such items as:
- a. The movement of materials to the work area,
  - b. Welding leads,
  - c. power leads,
  - d. pumps,
  - e. air and water hoses,
  - f. welding machines,
  - g. air compressors,
  - h. air tools,
  - i. hand tools,
  - f. grinding and burning tools.
- 4.1.4 Personnel entering an area where personal objects such as rings, watches, wallets, etc. could fall into openings shall remove all such items from their person.
- 4.1.5 Check that all panels, covers and guards are properly removed, stored and replaced for the required maintenance cleaning and housekeeping activity.

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- 4.1.6 Portable electric lighting used in moist and/or other hazardous locations, as for example, drums, tanks, and vessels shall be operated at a maximum of 12 volts.
- 4.1.7 Cable passing through work areas shall be covered or elevated to protect it from damage or electrical shock.
- 4.1.8 Extension cords shall be protected against accidental damage as may be caused by traffic, sharp corners, or projections and pinching in doors or elsewhere.
- 4.1.9 Ensure that any part or component installed in a clean system meets the cleanliness classification of that system to prevent contamination.
- 4.2 SPECIFIC MAINTENANCE CLEANLINESS AND HOUSEKEEPING OPERATIONS
- 4.2.1 Operations which generate particulate matter, such as grinding and welding, should be controlled as follows:
- Local cleanup of contaminated areas is recommended as maintenance progresses, rather than one cleanup operation when maintenance is completed.
  - Consideration should be given to sequencing operations, when practical, to facilitate cleaning and cleanliness control.
  - Where visual inspection of internal surfaces of a portion of a system can be blocked, that part of the system should be fabricated as a complete unit and a visual inspection should be performed just before the access points are closed.
- 4.2.2 Openings and pipe ends should be sealed at all times except when they must be unsealed to carry out necessary operations. Fitted and tack-welded joints (which will not be immediately sealed by welding) should be wrapped with polyethylene or other ~~low~~-halogenated plastic film until the welds can be completed. (Commitment 5543 and 5543)
- 4.2.3 Markings
- Keep markings to a minimum (i.e., use tags with ties).
  - When markings are necessary use markers which are low in halogen content and easy to remove (for example, use felt tip markers rather than crayons).

- c. Remove markings by mechanical means or solvents (non-halogenated solvents should be used on stainless or inconel materials) when the purpose for the marking has been served.

4.2.4 Surfaces (Commitment 9140)

- a. Avoid the use of acids on stainless or inconel materials.
- b. Clean surfaces of pipes and vessels after completion of work by mechanical, solvent, detergent or water as appropriate.
- c. Uninsulated stainless should be kept visually clean.
- d. Insulated stainless pipe should be washed with demineralized water as a final cleaning just prior to re-installation of insulation.
- e. Pre-cleaning and post-cleaning of weld joint areas and welds should be performed by wire brushing and scrubbing with a solvent-moistened clean cloth unless specified otherwise.

4.2.5 Local rusting on corrosion resistant alloys should be removed by mechanical methods.

4.2.6 Large openings, such as the open reactor vessel shall be protected against falling and wind blown contaminants.

4.2.7 Cleaning operations should be scheduled so as to minimize interference from other plant operations. Areas in which cleaning operations are being performed should be isolated to the extent that personnel performing other operations are aware that the cleaning operations are being conducted. (Commitment 5545)

4.2.8 Personnel should be trained to use the intended procedure and how to recognize the associated hazards.

4.2.9 Means for communicating should be provided between the local areas in which the cleaning is performed and any remote areas (e.g., control rooms) that may be related to the cleaning operations.

4.2.10 Critical valves, controls and switches should be tagged to prevent inadvertent actuation during the maintenance activity (reference Procedure 00304-C, "Equipment Clearance and Tagging"). (Commitment 5545)

4.2.11 The interior of readily accessible components (i.e., tanks) and large diameter pipe should be checked for cleanliness, all debris and contamination should be removed.

4.2.12 All permanently installed instrumentation should be isolated where possible. (Commitment 5545)

4.2.13 Leakage

Provisions should be made to collect leakage and to protect insulation from being wetted. (Commitment 5545)

4.3 CLASSES OF CLEANLINESS (FOR INTERNAL WORK ON PLANT FLUID AND G.A. SYSTEMS ONLY)

4.3.1 Class A Maintenance Cleanliness and Housekeeping Requirements:

A very high level of maintenance cleanliness and housekeeping in which there is no evidence of contamination of a surface either under visual examination, with or without magnification, or with the aid of sensitive detection methods. The requirements of this level of cleanliness are considered to be outside of the scope of this procedure.

4.3.2 Class B Maintenance Cleanliness and Housekeeping Requirements:

A high level of maintenance cleanliness and housekeeping applicable to internal surfaces in contact with reactor primary coolant, surfaces in contact with primary process fluids, and other similar critical applications. Surfaces should be free of dust, scale, acidic or basic salts, oil, grease and other contamination visible to the naked eye by persons of normal visual acuity, natural or corrected. Thin temper films resulting from welding or post-weld heat treatment are acceptable.

The surface should be free of organic films and contaminants such as oils, paint, and preservatives as determined by a visual examination or an organic solvent-dampened white cloth or an equivalent alternate method.

Before any valve seat repairs that involve grinding of Stellite seats take place, the following steps should be taken to limit the spread of Cobalt contamination.

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- a. The valve should be drained of fluid, wiped clean and allowed to dry.

## NOTE

Devices must be installed with sufficient clearance for the grinding disc and be treated as foreign articles in the piping system.

- b. inflatable dams or similar devices should be installed in the valve parts or runs to prevent distribution of debris into the piping system.
- c. In cases that permit it, a removable film (similar to the protective film used to coat small machine parts) or an adhesive cloth (e.g. tack cloth, two sided tape, or fly paper) should be used to line the valve cavity. Maintenance debris will adhere to these materials and will not come into contact with the valves interior surface.

Post-maintenance cleaning and inspection of valves should include the following steps:

## NOTE

A filter with a 2 to 5 micron rating should be used in the vacuum canister.

- a. The valve should be vacuumed using attachments to clean runs, ports or other difficult to reach areas of the valve.
- b. The grinding debris should be wiped out using a tack cloth or a lint free cloth and solvent that is compatible with the fluid in the system and not detrimental to the materials in the valve.
- c. Inflatable dams, removable film or adhesive cloth should be removed and disposed of properly.
- d. Visual inspection should be made with adequate lighting and mirrors and other devices if necessary.
- e. Wipe test should be made using clean, white, lint free cloths.

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Further cleaning is required when the valve fails either the visual or wipe inspection.

4.3.3 Class C Maintenance Cleanliness and Housekeeping Requirements:

An intermediate level of maintenance cleanliness and housekeeping applicable to the internal surfaces of those components and system that cool components, containing primary coolant. Such systems include the steam generating and feedwater systems and the component cooling water system. Surfaces should meet the requirements for Class B cleanliness, except:

- a. Thin uniform rust films are acceptable on carbon steel surfaces.
- b. Scattered areas of rust are permissible provided that the area of rust does not exceed 15 square inches in any 1 square foot on corrosion resistant alloys.
- c. Those precautions pertaining to valve seat repairs do not apply.

4.3.4 Class D Maintenance Cleanliness and Housekeeping Requirements:

A nominal level of maintenance cleanliness and housekeeping applicable to the external surfaces of primary and secondary systems and to the internal surfaces of open service water systems such as fire protection and intake cooling water. All surfaces should be free of heavy mill or heat treating scale. However, tightly adherent scale on non-machined carbon steel surfaces that resists removal may be permitted. Paint or preservative coatings on carbon steel surfaces that will not peel or flake when exposed to cold water flushing may be permitted. Stainless steel and other corrosion resistant alloy surfaces should not be painted or protectively coated unless specified by component specifications or technical manual requirements. Rust films on external surfaces that resist removal may be permitted.

4.3.5 General Maintenance Cleanliness and Housekeeping Requirements:

These routine maintenance cleanliness and housekeeping operations occur before, during and after a maintenance activity.



Routine maintenance cleanliness and housekeeping requirements before the maintenance activity starts. (Commitment 7510)

- (1) Ensure the work area is as clean as practicable, free from debris and decontaminated, if possible.
- (2) Provide for clean laydown areas as required for tools and equipment away from high traffic areas.
- (3) Protect equipment, material, tools and adjacent equipment from possible damage by the work to be performed by installing barriers or floor coverings as required.
- (4) Protect or shelter the work area and laydown areas as required from adjacent work or operation activities or from the weather (outside work).
- (5) Provide temporary shielding as practicable if necessary from nearby radiation hot spots (ALARA).
- (6) Take steps as necessary, including roping off the work areas and installing step off pads, to limit the spread of contamination (ALARA).
- (7) In routing drop cords and air and water hoses, avoid as far as practicable creating trip hazards or obstructing access ways. If possible, route drop cords and hoses in a manner to prevent their contamination or the spread of contamination (ALARA).
- (8) Provide an adequately ventilated and lighted work area.
- (9) Set up necessary fire and safety items.
- (10) Take special precautions to prevent foreign particles from entering crevices or blind holes that could create difficult clean-up situations.

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Routine maintenance cleanliness and housekeeping requirements during the maintenance activity.

- (1) Periodically police the area to remove debris and attain proper laydown of tools and equipment.
- (2) During the work progress, as the laydown areas are being used, segregate contaminated tools and equipment from the clean tools and equipment to prevent needless contamination, if possible.
- (3) Where possible, provide labeled containers for segregation of parts during disassembly and label parts that cannot be stored in containers.
- (4) Periodically check that installed barriers, shielding and floor coverings, ventilation and lighting are functional. Repair as required.
- (5) Take steps as necessary to prevent the entry of extraneous material into open piping, pumps or valves. These steps may include the following:
  - (a) Cover or seal the openings.
  - (b) Ensure all loose debris or material in the vicinity of the openings is removed.
  - (c) Provide a shelter above the openings to protect against work above.
  - (d) Provide tie-offs for tools and equipment which must be used in the immediate vicinity.
  - (e) Where final inspection of open piping, pumps or valves would not be practical for locating and removing loose debris or material and tools, such as vertical piping or valves installed in vertical lines, small tools or spare parts capable of entering the opening will be tied-off until the opening is closed.

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- (6) \*/\* Immediately preceding the closure of safety related equipment, or lines leading to safety related systems, opened for maintenance (pipe, pump, valve, vessel, etc.) have a person or persons not directly involved in the maintenance performed, inspect and sign off the data sheet. The prime objective of this inspection is to insure that no extraneous items remain in safety related equipment or systems that might hinder their operation. (Commitment 10391)

## CAUTION

Care should be taken in the use of oils, solvents, and lubricants to minimize the possibility of their entry into plant systems.

- (7) Anytime a job is left unattended for an extended period of time (end of work shift, personnel pulled for another job, parts on order, etc.):
- (a) Seal up all openings in piping, pumps and valves as necessary to prevent the entry of extraneous material.
  - (b) Disconnect and roll up hoses if practical, or at least assure no line pressure is in them.
  - (c) Store all tools, equipment and materials to be left in the work area, if possible, in locked gang boxes to prevent loss.
  - (d) If plant equipment cannot be returned to service the requirements of Procedure 00352-C, "Control Of In-Process Materials" will be met. (Commitment 9140)
  - (e) Oil, oily rags and other flammables, if not removed from the work area, should be stored in approved safety containers.
  - (f) Assure that the closure of fire doors is not blocked by hoses or drop cords or like materials.

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- (g) Provide temporary seals for breached fire barriers, if practical, and take other steps as necessary to limit fire hazard.
- (h) Lower all suspended loads. If this is not practical, ensure all suspended loads are secured in a manner to preclude personnel injury or equipment damage.
- (i) Notify the Maintenance Foreman of any conditions of possible personnel danger or fire hazard associated with the work area.
- c. Routine maintenance cleanliness and housekeeping requirements after the maintenance activity is ended are:
- (1) Removal of materials, tools, gang boxes, trash, equipment and oil cans from the area.
  - (2) Removal of shielding, barriers, ventilation, lighting and floor coverings installed to protect personnel and equipment during the maintenance activity.
  - (3) Decontamination of tools, equipment and materials, if necessary, and return them to their designated areas of permanent storage.
  - (4) Ensure that the work area is clean and restored to its original condition (or better).
  - (5) If a tool log, see Figure 2, has been kept verify that all tools are accounted for (i.e., Refueling Floor Tool Sign In Log).
  - (6) Return and re-install all safety covers, barriers, panels and signs as required.

## 4.3.6

## SYSTEM CLEANNESS CLASS ASSIGNMENTS

Refer to Table 2 for the assigned cleanliness class for the system. Also included on this table is the suggested method of cleaning the system and the suggested layout of the system.

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**MAINTENANCE CLEANLINESS AND HOUSEKEEPING STANDARDS**

The Maintenance Cleanliness and Housekeeping Standards are summarized in Table 1, "Maintenance Cleanliness and Housekeeping Standards"; controlled by Data Sheet 1, "Maintenance Cleanliness and Housekeeping Data Sheet"; and routinely kept up by the maintenance person with the aid of Figure 1, "Maintenance Cleaning and Housekeeping Handout".

4.4.1

**Maintenance Cleanliness and Housekeeping Standards Summary Table 1**

Table 1, "Maintenance Cleanliness and Housekeeping Standards Summary", summarizes the cleanliness and housekeeping standards which shall be done to assure Class A, B, C, and D Maintenance Cleanliness and Housekeeping requirements are met.

4.4.2

**Maintenance Cleanliness and Housekeeping Standards "Data" Sheet 1**

Data Sheet 1, "Maintenance Cleanliness and Housekeeping Data Sheet", provides a checkoff of maintenance cleanliness and housekeeping for either Class B, C, or D.

**NOTES**

MWO ONLY

- a. Class A Maintenance Cleanliness and Housekeeping Requirements as described in Section 4.3.5b.5)(a), "Class A Maintenance Cleanliness and Housekeeping Requirements" are manufacturing requirements and not applicable to this procedure.
- b. The most restrictive Maintenance Cleanliness and Housekeeping Class as determined by the Maintenance Foreman shall encompass all of the other Maintenance Cleanliness and Housekeeping Standards under it.
- a. The Maintenance Foreman shall review the work to be performed and determine the required cleanliness classification. The foreman will enter the classification on the MWO and attach a "Maintenance Cleanliness and Housekeeping Data" Sheet to the MWO for classifications B, C and D.

At the completion of the MWO activity, the Maintenance Foreman shall sign the Data Sheets and approve or disapprove them.

4.4.3 Maintenance Cleanliness and Housekeeping Handout (Figure 1)

- a. Figure 1, "Maintenance Cleanliness and Housekeeping Handout" is attached to Maintenance Work Orders (MWO) as an aid to help the maintenance person in the performance of his maintenance cleanup and housekeeping activities.
- b. The attachment of this handout to MWO is at the discretion of the Maintenance Foreman, and if attached to the MWO, is always removed after the completion of the MWO maintenance activities.

4.5 ZONE DESIGNATIONS (FOR GENERAL WORK AREAS)

The Maintenance Foreman should determine the Zone Designation when maintenance work is being performed; craftsmen should perform work and clean-up operations to ensure that cleanliness is maintained in accordance with applicable Zone Designation.

4.5.1 All areas of the plant shall be considered Housekeeping Zone V with the following exceptions:

- a. Areas where the use of tobacco, eating, and drinking are restricted per Procedure 00253-C, "Smoking, Eating And Drinking Policy", shall be considered Housekeeping Zone IV,
- b. Areas directly adjacent to open safety-related systems shall be considered Housekeeping Zone IV,
- c. Areas in which work activities are being performed in association with the inspection of nuclear fuel shall be considered Housekeeping Zone II,
- d. Areas, in and around the spent fuel pool, the refueling canal and the reactor cavity, and in which work activities are being performed in association with refueling operations, shall be considered Housekeeping Zone II,
- e. Areas shall be subject to a level of cleanliness controls higher than those of Housekeeping Zone V, when specified in an applicable procedure for a specific work activity,

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Areas shall be subject to a level of cleanliness control, higher than those of Housekeeping Zone V, when specified by supervisory personnel in charge of a work activity.

#### 4.6 HOUSEKEEPING ZONE V

4.6.1 Areas of the plant designated Housekeeping Zone V shall be maintained in an orderly manner and a generally clean condition. Trash, spills, and debris shall be cleaned up. Equipment, hand tools and materials when not in use, shall be stored or properly disposed of.

4.6.2 Temporary hoses, cords, and cables should be arranged in such a way that accumulation of work related waste is easily cleaned and egress paths are not blocked.

4.6.3 All work areas shall be maintained sufficiently clean such that work activities:

- a. Can proceed in an efficient manner
- b. Will not degrade plant systems and equipment
- c. Will not pose a personal safety hazard.

4.6.4 Work activities should be performed in ways which minimize work related waste. The work area shall be cleaned upon completion of work.

4.6.5 Canopies, tarpaulins, or other protective coverings shall not cover access to exits, egress from exits, or visibility of exits. Mirrors shall not be placed on any exit in such a manner as to confuse the direction of exit.

4.6.6 Obstructions, railings or barriers shall not be placed across aisles such as to obstruct paths of emergency egress.

#### 4.7 HOUSEKEEPING ZONE IV

4.7.1 Requirements of 4.6 apply.

4.7.2 The use of tobacco, eating, and drinking shall be controlled per Procedure 00253-C, "Smoking, Eating, And Drinking Policy".

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4.8 ~~HOUSEKEEPING~~ ZONE III

4.8.1 Requirements in Section 4.7 apply.

4.8.2 Unnecessary packing material, containers, boxes, entering the zone shall be minimized by unpacking prior to entry into the zone, where feasible.

4.8.3 Accountability of items entering the zone shall be as follows: (Commitment 15379) *Delete, see attachment*

~~UNIQUE IDENTIFIER~~

~~DELETE~~

a. All tools and materials taken into the zone which are to be removed by the end of the activity shall have a sequentially numbered tag attached while inside the zone. Those items do not need to be logged into the zone ~~but~~ <sup>and</sup> will be accounted for at the end of the activity. ~~by an accounting of the numbered tags.~~ SHALL

## NOTE

~~An inventory of sequentially numbered tags will be maintained by the Maintenance Department and issued from the Maintenance Duty Manager.~~ *Delete*

b. ~~All loose items inside the zone must have a tag attached or be removed from the zone with the exception of equipment replacement parts.~~

4.8.4 For activities requiring accountability of tools, materials, and/or personnel, the OSOS shall notify Security who will post an officer at the zone access point for continuous surveillance and maintenance of accountability logs. (See Figure 3) The access point shall be monitored continuously while activities are in progress, however, should a break in activity be expected for a period greater than two hours, the area shall be posted "NO ACCESS" and the access point deactivated until the activity is restarted.

4.8.5 Areas directly adjacent to open safety related systems shall be protected to prevent cleanliness degradation of systems.

ALL items inside the zone which CAN NOT be UNIQUELY identified shall have a sequentially numbered Tag/Label attached and logged or be removed from the zone with the exception of equipment replacement parts. ALL Tagged items inside the zone will be accounted for AT the end of the activity.



## Attachment

4.8.3 a. All tools and materials taken into the zone which are to be removed by the end of the activity shall be accounted for at the end of the activity.

b. All items inside the zone which cannot be uniquely identified by serial<sup>N<sup>o</sup></sup>s such as common usage tools shall be logged by description and quantity or be removed from the zone with the exception of replacement parts. All items, logged into the zone will be accounted for at the end of the activity.

4.8.4 For activities requiring accountability of tools, materials, and/or personnel, a responsible individual shall be posted at the zone access point for continuous surveillance and maintenance of accountability logs. (see figure 3). ~~This responsible individual shall monitor the access point~~ the access point shall be monitored continuously while activities are in progress, however, should a break in activity be expected for a period greater than two hours, the area may be posted "no Access" and the access point deactivated until the activity is restarted.

4.8.5 Areas directly adjacent to open safety related systems shall be protected to prevent cleanliness degradation of the system.

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- 4.9 HOUSEKEEPING ZONE II
- 4.9.1 Requirements in Section 4.8 shall apply.
- 4.9.2 Surfaces near system openings, including open components, shall be maintained to minimize unwanted chemicals, dust, and foreign particles. Methods to protect components include the use of tape, covers, plugs, caps, and other methods, as applicable.
- 4.9.3 Grinding or welding activities near open systems shall be contained.
- 4.9.4 Clean gloves, shoe covers, and head covering shall be worn.
- 4.10 HOUSEKEEPING ZONE I (Commitment 5543)
- 4.10.1 Requirements in Section 4.9 shall apply.
- 4.10.2 Specific cleanliness control requirements shall be designated in the applicable work procedure.
- 4.10.3 Material and tools entering the area shall be pre-cleaned and maintained to ensure foreign particles and unwanted chemicals are not present in amounts that would be detrimental to the work in progress or systems involved.
- 4.10.4 Any wood entering the area shall be protected so that there is no possibility for loss of splinters or paint chips and fire loading is kept to a minimum.
- 4.10.5 Areas shall be maintained such that foreign particles are minimized to the extent that only small areas of soft dust on floors, equipment, and structures exist.
- 4.10.6 Outer clothes shall be changed for coveralls which shall be worn.
- 4.10.7 Objects shall be prevented from dropping or loss by securing to coveralls by appropriate methods.
- 4.10.8 Filtered air shall be provided to this zone.
- 4.10.9 Tools shall be tethered.

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4.10.10 The supervisor shall be immediately notified if a tool, foreign object, device, or any other material is dropped into a vessel, pool, tank or vertical pipe.

4.10.11 Broken tools or components should be assembled outside the area to ensure no parts are left behind.

5.0 ACCEPTANCE CRITERIA

5.1 Maintenance performed using this procedure is acceptable when;

5.1.1 The "Data" Sheet is properly filled out and approved.

5.1.2 Deviations from this procedure will be evaluated on a case-by-case basis and approved by the Maintenance Foreman.

5.1.3 A Maintenance Work Order will be written and submitted for those conditions evaluated as needing further attention.

5.1.4 List any unanticipated conditions or non-conformances in the "Comments" section of the "Data" Sheet.

6.0 REFERENCES

6.1 ANSI N18.7-1976, Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plant

6.2 ANSI 45.2.1, Cleaning of Fluid Systems and Associates Components (as applicable)

6.3 ANSI 45.2.3, Housekeeping During Construction Phase of Nuclear Power Plants (as applicable)

6.4 PROCEDURES

6.4.1 00254-C, "Plant Housekeeping And Cleanliness Control"

6.4.2 00304-C, "Equipment Clearance And Tagging"

6.4.3 40011-C, "Radiation Work Permit (RWP)"

6.4.4 00352-C, "Control Of In-Process Materials"

6.5 Commitment 15379-AFR 298-II

END OF PROCEDURE TEXT

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TABLE 1

MAINTENANCE CLEANLINESS STANDARDS SUMMARY

## VISUAL INSPECTION

CLASS	SURFACE APPEARANCE	PERMISSIBLE AREAS OF RUST	PARTICULATE CONTAMINATION	ORGANIC CONTAMINATION	NON-VISUAL INSPECTION	
					DRY WHITE CLOTH WIPE	SOLVENT WHITE CLOTH WIPE
A	With or without magnification no evidence of contamination	None	None	None	Clean/Clear	Clean/Clear
B	Metal clean without magnification at 100 Fc	2 Sq. In./ 1 Sq. Ft. of surface	Free of particulate contamination.	Free of organics when using solvent dampened white cloth	Clean/Clear	Clean/Clear
C	Thin uniform rust on carbon steel is acceptable	15 Sq. In./ 1 Sq. Ft. of surface	No gross removable particulates via bristle brush	No gross removable organics via bristle brush	No gross removable contaminates	No gross removable contaminates
D	Tightly adherent mill scale on carbon steel surfaces	Rust which resists removal by scrubbing with bristle brush.	No gross removable particulates via bristle brush	No gross removable particulates via bristle brush	No gross removable contaminates	No gross removable contaminates

TABLE 2

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CLEANNESS CLASS ASSIGNMENTS,  
FLUSH METHODS, AND LAYUP METHODS

<u>Startup System Title</u>	<u>Internal Clean Class*</u>	<u>Cleaning Method*</u>	<u>Suggested Layup Method</u>
<b>MECHANICAL SYSTEMS</b>			
Main Steam	(1)	CC/MC/V	1, 4
Condensate	C (2,3)	PR/MC/CC	2
Feedwater	C (3)	PF/CC	2
Heater Drains	C (3)	PF/CC	2
Extraction Steam	C (3)	MC/CC	1
Condensate Demineralizer	C	MC/PF	1
AFW Motor Drive	C (3)	PF/CC	1, 3
River Intake Structure	D	PF/MC	3
Plant Demineralized Water	B	PF	3
Condensate Chemical Injection	C	PF	1, 3
<b>NSSS CONTROLS AND AUXILIARIES</b>			
Reactor Coolant	B	MC/PF	4
Residual Heat Removal	B	PF	4
Water Evaporator Steam Supply System	C	MC/PF?PS	4

\* For legends used see last page of this table

- (1) Portions of system not chemically cleaned will be visually inspected or manually cleaned to verify lines are clear and free of gross contamination.
- (2) Main condenser circulating water side is Class D.
- (3) For portions of system not chemically cleaned only.

TABLE 2 (CONT'D.)

CLEANNESS CLASS ASSIGNMENTS,  
FLUSH METHODS, AND LAYUP METHODS

<u>Startup System Title</u>	<u>Internal Clean Class*</u>	<u>Cleaning Method*</u>	<u>Suggested Layup Method</u>
Chemical and Volume Control System	B	PF	
Safety Injection	B (12)	PF	
Containment Spray	B/C (4)	PF/PB	1, 3
Reactor Makeup Water Storage and Degasifier	B	PF/MC	4
Steam Generator Blowdown	C	PF	4
Refueling Water Storage Tank	B	PF/MC	4
<b>TURBINE-GENERATOR CONTROLS AND AUXILIARY</b>			
Turbine Steam Seals	C	PS	1
Turbine Lube Oil	C (5)	PF	3
Turbine Generator Gas	C (5)	PB	1
Turbine Generator Hydrogen Seal Oil	C (5)	PF	3
Turbine Generator Stator Cooling	C (5)	PF	3
Turbine Lube Oil Storage & Filtration	C	MC/PF/CC	3
Condenser Air Ejection	C	PF/PB	1
Main Turb Control Oil (EHC)	B (5)	PF	3

(4) Sections of system supplying RWST are Class B.

(5) General Electric Standards

(12) Verification shall be by sampling 2 consecutive dumps of a full accumulator through the cloth/screen.

TABLE 2 (CONT'D.)

CLEANNESS CLASS ASSIGNMENTS,  
FLUSH METHODS, AND LAYUP METHODS

<u>Startup System Title</u>	<u>Internal Clean Class*</u>	<u>Cleaning Method*</u>	<u>Suggested Layup Method</u>
<b>CIRCULATING WATER</b>			
Circulating Water	D	MC/PF	3
Circulating Water Chemical Injection	C/D (6)	MC/PF	1, 3
Condenser Tube Cleaning System	D	PF	3
<b>COOLING WATER</b>			
Turbine Plant Cooling Water	D	PF	3
Turbine Building Closed Cooling Water	C	PF	3
Spent Fuel Pool Cooling and Cleanup	B	MC/PF	1
Auxiliary Component Cooling Water	C	PF	3
Nuclear Service Cooling Water	C/D (6)	PF/MC	3
Component Cooling Water	C	PF	3
<b>AUXILIARY STEAM</b>			
Auxiliary Boiler	C	CC/PS	2, 3
Auxiliary Steam System	C	PS	1, 3
Steam Generator Feed Pump Turbine	C	MC/PS	1

(6) Chemical sections are Class C, water piping is Class D.

TABLE 2 (CONT'D.)  
CLEANNESS CLASS ASSIGNMENTS,  
FLUSH METHODS, AND LAYUP METHODS

<u>Startup System Title</u>	<u>Internal Clean Class*</u>	<u>Cleaning Method*</u>	<u>Suggested Layup Method</u>
<b>HVAC</b>			
Normal Chilled Water	C	PF	3
Radwaste Bldg. HVAC	C (7)	PF	3
Essential Chilled Water (ESF)	C	PF	3
Fire & Well Pumphouse HVAC	C (7)	PF	3
Plant Entry & Security Bldg. HVAC	C (7)	PF	3
<b>RADWASTE</b>			
Waste Processing System-Gas	C	PF/PB/CC	1
Waste Processing System-Liquid	B/D (8)	PF	3
Backflushable Filter System	B/D (8)	PF/PB	1
Resin & Crud Transfer	D	PF/PB	1
Boron Recycle	B/C (8)	PF	4
Volume Reduction	D	PF/PB	1
CTB and Auxiliary Building Drains (RAD)	D	MC/DF	3
Radwaste Solid - Polymer	D	PF/PB	1
Radwaste Solid - Cement	D	PF/PB	1
Radwaste Solid - Services Fuel	D	PF/PB	1

(7) Chilled Water System only.

(8) Class B in sections of systems supplying N.S.S. systems.



TABLE 2 (CONT'D.) -

CLEANNESS CLASS ASSIGNMENTS,  
FLUSH METHODS, AND LAYUP METHODS

<u>Startup System Title</u>	<u>Internal Clean Class*</u>	<u>Cleaning Method*</u>	<u>Suggested Layup Method</u>
<b>FUEL</b>			
Fuel Auxiliary Boiler Fuel Oil Transfer and Storage	C	PF	3
Diesel Generator Fuel Oil	C	PF	3
<b>SERVICES</b>			
Service Air	D	PB	3
Instrument Air	C	PB	3
Fire Protection Water	D	PF/PB	3
Potable Water	D	PE	3
Fuel Handling & Vessel Servicing	B/D (9)	MC	3
Utility Water	D	PF	3
Auxiliary Gases (O <sub>2</sub> , N <sub>2</sub> , and H <sub>2</sub> )	B/D (8)	PB	1, 3
Diesel Generator	C/D	MC/PF	3
Plant Makeup Water Well	D	PF	3
Fire Protection-Halon	D	PB	1, 3
<b>NON-RADIOACTIVE DRAINS</b>			
Turbine Building Drain System	D	MC/PF/DF	3
Auxiliary Building and Miscellaneous (Non-Rad) Drain System	D	DF/MC/PF	

- (8) Class B in sections of systems suppling N.S.S. systems.
- (9) Demineralized Water Class B Service Air Class D.
- (10) Class D on Jacket Water Portion.

TABLE 2 (CONT'D.)

CLEANNESS CLASS ASSIGNMENTS,  
FLUSH METHODS, AND LAYUP METHODS

<u>Startup System Title</u>	<u>Internal Clean Class*</u>	<u>Cleaning Method*</u>	<u>Suggested Layup Method</u>
Auxiliary Building Flood Retaining Rooms, Alarms, and Drains	D	DF/MC/PF	3
Control Building Drain System	D	DF/MC/PF	3
Waste Water Effluent System System	C/D (11)	DF/MC	3
Fuel Handling Building Drains	D	DF/MC/PF	3
<b>CONTROL SYSTEMS</b>			
Balance of Plant Sampling System	C	PF	1, 3
Emergency Response Facility & PAMS System	C	PF/PB	3
<b>NUCLEAR CONTROLS AND MONITORING</b>			
Nuclear Sampling System	B	PF/PB	1, 3
Miscellaneous Leak Detection	C	PF	3

(10) ~~Chemical~~ Section is Class C.~~Legend~~Explanation

B	Cleanness classification "B"
C	Cleanness classification "C"
D	Cleanness classification "D"
CC	Chemically cleaned
DF	Drains flushed open, no proof screening required.

TABLE 2 (CONT'D.)

<u>Legend</u>	<u>Explanation</u>
MC	Mechanically/Manual cleaned before filling
PB	Gas blown with procedure
PF	Proof flush with procedure
PS	Steam blown with procedure
V	Visual Inspection, lines verified clear

  

1. Layup clean and dry.
2. Layup wet or dry. Wet layup: 100 percent filled with demineralized water to which hydrazine and ammonia were added to a level of 75-200 ppm hydrazine and pH of 9.8-10.5. Cap with nitrogen under positive pressure. Dry layup: Displace demineralized water under a blanket of nitrogen under positive pressure at .5 to 5 psig.
3. System to be placed in service, no layup required.
4. Layup in accordance with NSSS vendor recommendations.

MAINTENANCE CLEANLINESS AND HOUSEKEEPING HANDOUTBEFORE THE MAINTENANCE ACTIVITY

- (1) Make area clean and clear.
- (2) Protect equipment, tools and materials.
- (3) Check ventilation and lighting.
- (4) Keep cords and hoses in a neat and secure manner.
- (5) Set up controls to minimize radiation exposure and contamination (ALARA).
- (6) Set up job for WORK SAFETY and FIRE SAFETY.

DURING THE MAINTENANCE ACTIVITY

- (1) Keep checking area for trash and debris.
- (2) Keep tools and materials neat and orderly.
- (3) Check JOB SAFETY and FIRE SAFETY.
- (4) Prevent objects from dropping into work.
- (5) Before closing safety equipment, have the foreman check the work.
- (6) Do not leave job unattended after final inspection unless all openings are sealed.
- (7) Clean up oil and grease.
- (8) Secure Job, if it has to be left unattended (i.e., NO SAFETY OR FIRE HAZARDS for unattended jobs).

AFTER THE MAINTENANCE ACTIVITY

- (1) Remove all materials, tools equipment and trash.
- (2) Remove all barriers, supports and rigging.
- (3) Replace signs, handrails, ladders, covers, panels, and guards.
- (4) Clean up work and work area.
- (5) Clean tools, equipment, hoses, and leads.
- (6) Store everything in its proper place.
- (7) Secure fire watch and safety items.

FIGURE 1

INVENTORY OF TOOLS, EQUIPMENT AND MATERIALS  
TAKEN INTO THE ZONE

User badge No.

ITEM IN	MODEL NO. OR ID MARK	SERIAL NO.	ITEM REMOVED OR ACCOUNTED FOR	
			SUPV.	INTLS./DATE
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				

Broken tools, parts and equipment have been reassembled to account for fragments.  
Parts and equipment removed have been reassembled to ensure all parts have been removed.

LIST CONTINUED ON AN ADDITIONAL SHEET? ( ) YES ( ) NO

\* FILE W/COMPLETED MWO

FIGURE 2 (SAMPLE)

Procedure No.

VEGP

20427-C

Revision

9+ RMC  
3/09/90

751 JPS  
2/29/90

Page No.

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PERSONNEL ACCOUNTABILITY LOG

UNIT NO \_\_\_\_\_

DATE: \_\_\_\_\_

ZONE DESIGNATION: \_\_\_\_\_

WORK ACTIVITY LOCATION (DESCRIPTION): \_\_\_\_\_

JOB DESCRIPTION: \_\_\_\_\_

JOB SUPERVISOR: \_\_\_\_\_

(PRINT) NAME

TIME AND DATE JOB COMPLETED \_\_\_\_\_

WORKCREW MEMBERS ENTRY AND EXIT ROSTER

NAME	INITIALS TIME											
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1												
2												
3												
4												
5												
6												
7												

\* FILE W/COMPLETED MWO

LIST CONTINUED ON ADDITIONAL SHEET ? ( ) YES ( ) NO

FIGURE 3 (EXAMPLE)



DATA SHEET 1

MAINTENANCE CLEANLINESS AND HOUSEKEEPING

Maintenance Work Order No. \_\_\_\_\_ Date \_\_\_\_\_

Maintenance Cleanliness and Housekeeping Standard Required  
 B C D (Circle one)

Name of system or component requiring cleaning \_\_\_\_\_

CLEANLINESS STANDARDS

B	C	D	INIT/DATE
Metal clean surface.	Thin rust on carbon steel OK.	Tight mill scale Carbon steel OK.	_____/____/____
Rust allowable 2 sq/in per 1 sq/ft.	Rust allowable 15 sq/in per 1 sq/ft.	Rust which resists brushing.	_____/____/____
*** No particulates/particles removable by brushing.			_____/____/____
*** No oil, grease, or other organic films removable by brushing.			_____/____/____
*** Perform closeout Step 4.3.5.b.6.			_____/____/____
*** No contaminants removable in large amounts by wiping.			_____/____/____
*** Decon tools and equipment.			_____/____/____
*** Finish maintenance cleaning and housekeeping using Figure 1, "Maintenance Cleanliness and Housekeeping Handout".			_____/____/____

COMMENTS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

MAINTENANCE PERSON SIGNATURE/DATE \_\_\_\_\_ DATE RESULTS REVIEWED \_\_\_\_\_

( ) Approved  
 ( ) Disapproved

MAINTENANCE FOREMAN SIGNATURE/DATE \_\_\_\_\_

\*\*\* (for all cleanliness standards)