

WASTE GAS DISPOSAL SYSTEM

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THREE MILE ISLAND NUCLEAR STATION
UNIT #2 OPERATING PROCEDURE 2104-4.3

WASTE GAS DISPOSAL SYSTEM

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THREE MILE ISLAND NUCLEAR STATION
UNIT #2 OPERATING PROCEDURE 2104-4.3
WASTE GAS DISPOSAL SYSTEM

1.0 REFERENCES

1.1 Drawings Applicable for Operation.

- 1.1.1 Radwaste Gas Disposal, B&R Flow Diagram 2028.
- 1.1.2 Demineralized Service Water, B&R Flow Diagram 2007.
- 1.1.3 Instrument Air, B&R Flow Diagram 2012.
- 1.1.4 Nuclear Services Closed Cooling Water, B&R Diagram 2030.
- 1.1.5 Reactor Coolant Liquid Waste Disposal, B&R Diagram 2027.
- 1.1.6 Miscellaneous Liquid Waste Disposal, B&R Diagram 2045.
- 1.1.7 Nuclear Sampling, B&R Diagram 2031.
- 1.1.8 Nuclear and Radwaste Nitrogen Supply, B&R Diagram 2036.

1.2 Operating Procedures Applicable for Operation.

- 1.2.1 2104-1.10, Nuclear and Radwaste Nitrogen Supply.
- 1.2.2 2104-1.11, Nuclear Plant Sampling.
- 1.2.3 2104-2.3, Instrument Air.
- 1.2.4 2104-2.2, Demineralized Service Water.
- 1.2.5 2104-3.2, Nuclear Services Closed Cooling Water.
- 1.2.6 2104-4.1, Miscellaneous Liquid Waste Disposal.
- 1.2.7 2104-4.2, Reactor Coolant Liquid Waste Disposal.
- 1.2.8 2105-1.8, Radiation Monitoring.
- 1.2.9 2107-1.1, BOP Auxiliary Electrical.
- 1.2.10 HPP-1622.2, Releasing Radioactive Gaseous Waste from Unit 2.

1.3 Manufacturers' Instruction Manuals.

- 1.3.1 Nash Engineering Company, Waste Gas Compressors (55-00),
Bulletin No. 475-A.

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- 1.3.2 Victoreen Instrument Division, Radiation Monitoring (65.00).
- 1.3.3 Mine Safety Appliance, Waste Gas Filter (63.00).
- 1.3.4 Armstrong Float Type Liquid Drainer (999.22), Bulletin No. 401-A, Model No. 21-312.

1.4 Applicable System Descriptions.

- 1.4.1 Demineralized Service Water System, Index No. 5.
- 1.4.2 Instrument and Service Air System, Index No. 10.
- 1.4.3 Radwaste Disposal, Reactor Coolant Liquid System, Index No. 21.
- 1.4.4 Radwaste Disposal, Gas System, Index No. 22.
- 1.4.5 Nuclear Services Closed Cooling Water System, Index No. 24.
- 1.4.6 Nuclear Sampling System, Index No. 25.
- 1.4.7 Nitrogen for Nuclear and Radwaste System, Index No. 30.
- 1.4.8 Radwaste Disposal, Misc. Liquid System, Index No. 44.

2.0 LIMITS AND PRECAUTIONS

2.1 Equipment

- 2.1.1 The maximum number of compressor starts must not exceed ten (10) per hour to avoid damage to the compressor and associated controls.
- 2.1.2 Never run a compressor without demineralized water - even when checking motor rotation. Normal water prime in one-third to one-half a casing.
- 2.1.3 Never start a compressor when the water level is above the casing centerline. This can lead to rotor blade failure.
- 2.1.4 The compressor requires grease lubrication of the pedestal and motor ball bearings. Do not over grease as this will cause the bearings to run hot and possible cause trouble.

- 2.1.5 During compressor operation the stuffing box gland should be adjusted to permit a slight outward leakage of water.
- 2.1.6 The separators should be blown down daily to avoid scale and sludge formation.
- 2.1.7 The isolation valves for the unloader valves of the compressors must be open prior to starting the compressors.
- 2.1.8 Observe precaution when operating normally vented equipment which has been isolated from the vent header. Care needs to be taken not to overpressurize nor to depressurize the equipment.

2.2 Administrative.

- 2.2.1 Comply with Unit 2 Administrative Procedure 1003, the Radiation Protection Manual.
- 2.2.2 No gas shall be released to the atmosphere without a Waste Gas Release Permit per HPP-1622.2.
- 2.2.3 The gas release rate shall never exceed 100 scfm as indicated by WDG-FI-3552 on Panel 302B.
- 2.2.4 The filter assembly shall be replaced when the radioactivity level in the filter becomes excessive or when the differential pressure drop reaches 10 inches of water at 100 scfm. The clean filter has a pressure drop of 3 inches of water at 100 scfm.
- 2.2.5 Hydrogen concentration must be maintained at less than 3% concentration in the waste gas header and the waste gas decay tanks. If the concentration exceeds 3% hydrogen then nitrogen must be bled into the waste gas header and/or decay tank(s) to dilute the gas to less than 3% hydrogen.

- 2.2.6 Observe precaution to minimize the possibility of suffocating personnel working on or near the Waste Gas System.
- 2.2.7 Do not pressurize a Waste Gas Decay Tank above 110 psig. The alarm setpoint is 115 psig. The relief valve is set at 120 psig relieving to the Station Vent by-passing the Waste Gas Filter.

3.0 PREREQUISITES

Initial Each Step Upon Satisfactory Completion.

- ___ 3.1 The Nuclear and Radwaste Nitrogen System is in operation per 2104-1.10.
- ___ 3.2 The Nuclear Plant Sampling System is in operation per 2104-1.11.
- ___ 3.3 The Instrument Air System is in operation per 2104-2.3.
- ___ 3.4 The Demineralized Service Water System is in operation per 2104-2.2.
- ___ 3.5 The Nuclear Service Closed Cooling Water System is in operation per 2104-3.2.
- ___ 3.6 The Miscellaneous Liquid Waste System is in operation per 2104-4.1.
- ___ 3.7 The Radiation Monitoring System is in operation per 2105-1.8.
- ___ 3.8 Power is available to the 480V MCC 2-32A and breaker 7CF for WDG-P-1A is closed. Power is available to the 480V MCC 2-42A and breaker 7BR for WDG-P-1B is closed.
- ___ 3.9 The Waste Gas System is lined-up per the Start-up Valve Line-up which is APPENDIX A to these procedures.
- ___ 3.10 The control switches on Panel 302B for the Waste Gas Compressors are in the OFF position.

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4.0 PROCEDURES

Initial Each Step Upon Satisfactory Completion.

4.1 Start-up.

- ____ 4.1.1 CHECK OPEN WDG-V172, the Waste Gas Compressors discharge CROSS-CONNECT valve.

CAUTION: This valve must be open to enable both compressors to charge to a single decay tank.

- ____ 4.1.2 OPEN WDG-V26A (B), the Decay Tank inlet valve, for the tank, WDG-T-1A (B) to be charged.

- ____ 4.1.2 CHECK the compressor moisture separators water levels per precautions 2.1.2 and 2.1.3. Adjust the water level as required.

CAUTION: Comply with Unit 2 Administrative Procedure 1003, the Radiation Protection Manual. The compressors are in a Radiation Zone VII.

- ____ 4.1.3 PLACE the compressor control switches in RUN and monitor for abnormal noise and vibration.

CAUTION: Comply with Unit 2 Administrative Procedure 1003, the Radiation Protection Manual. The compressors are in a Radiation Zone VII.

- ____ 4.1.4 PLACE the compressor control switches in the desired mode of operation.

NOTE: For normal operation put one compressor in AUTO-HI and the other compressor in AUTO-LO.

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WDG-P-1A

_____ RUN

_____ OFF

_____ AUTO-LO

_____ AUTO-HI

WDG-P-1B

_____ RUN

_____ OFF

_____ AUTO-LO

_____ AUTO-HI

4.2 Normal Operation.

CAUTION: Comply with Unit 2 Administrative Procedure 1003, the Radiation Protection Manual.

4.2.1 The following components are normally line-up to the vent header:

4.2.1.1 Miscellaneous Waste Hold-up Tank, WDL-T-2.

4.2.1.2 Auxiliary Building Sump Tank, WDL-T-5.

4.2.1.3 Spent Resin Storage Tanks, WDS-T-1A, 1B.

4.2.1.4 Concentrated Waste Tank, WDS-T-2.

4.2.1.5 Reclaimed Boric Acid Tank, WDS-T-3.

4.2.1.6 Reactor Coolant Bleed Hold-up Tanks, WDL-T-1A, 1B, 1C.

4.2.1.6.1 Reactor Coolant Drain Tank, WDL-T-3 (via WDL-T-1A, 1B, 1C).

4.2.1.7 Reactor Coolant Evaporator, WDL-Z-1 (when shutdown with the vacuum broken).

4.2.2 The Vent Header and Decay Tanks are periodically sampled for excessive hydrogen.

4.2.3 Pressure regulator, WDG-V59, throttles to control the compressor inlet pressure at 1.0 psig.

4.2.4 The Waste Gas System will operate automatically to maintain the Vent Header pressure between 2.5 and 5.0 psig when the compressors are in the AUTO LOW modes and at 1.0 psig when the compressors are in the RUN mode.

4.2.5 Both compressors are normally lined-up to a single Decay Tank. A Decay Tank can be pressurized to 110 psig. After sufficient decay time the waste gas is either released to the environment via the Station Vent or reused via the Reactor Coolant Bleed Hold-up Tanks.

4.2.6 The system shall be periodically monitored:

4.2.6.1 Monitor the compressors for abnormal noises and vibrations.

4.2.6.2 Monitor the compressor sight glass for proper water level control. The level should remain essentially at the mid-plane of the compressors.

4.2.7 The Moisture Separator of an operated compressor should be blown down daily.

4.2.7.1 OPEN WDG-V76A (B), the manual drain valve, while observing the water level in the sight glass.

CAUTION: Insure that the water level does not decrease significantly.

4.2.7.2 CLOSE WDG-V76A (B) when the blowdown is complete.

4.3 Shutdown.

4.3.1 CLOSE the normally open valves that supply Waste Gas to the Vent Header:

<u>Initial</u>	<u>Valve</u>	<u>Component</u>
_____	WDG-V256	WDL-T-2
_____	WDG-V16	WDL-T5
_____	WDG-V17A	WDS-T-1A
_____	WDG-V100A	WDS-T-1A
_____	WDG-V17B	WDS-T-1B

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<u>Initial</u>	<u>Valve</u>	<u>Component</u>
_____	WDG-V100B	WDS-T-1B
_____	WDG-V65	WDS-T2
_____	WDG-V90	WDS-T-3
_____	WDL-V26A	WDL-T-1A
_____	WDL-V26B	WDL-T-1B
_____	WDL-V26C	WDL-T-1C

- _____ 4.3.2 CLOSE all normally closed valves that had been opened to vent a component to the Vent Header.
- _____ 4.3.3 PLACE the compressor control switches in the OFF position.
- _____ 4.3.4 OPEN breaker 7CF on MCC 2-32A for WDG-P-1A.
- _____ 4.3.5 OPEN breaker 7BR on MCC 2-42A for WDG-P-1B.

4.4 Special or Infrequent Operations.

4.4.1 Decay Tank Discharge to the Station Vent.

The release of waste gas is done by the manual controlled venting of the Waste Gas Decay Tank to the Station Vent.

- _____ 4.4.1.1 The Waste Gas Decay Tank, WDG-T-1A (B), selected to be released in not being charged.
- _____ 4.4.1.2 HANG a "DO NOT OPERATE" tag on WDL-V26A (B) control switch.
- _____ 4.4.1.3 The following interfacing has been completed with the Health Physics Department:
 - _____ 4.4.1.3.1 The HP/Chem Department has been notified that the Operations Department wants to release a Waste Gas Decay Tank.
 - _____ 4.4.1.3.2 The HP/Chem Department has taken a sample of the tank to be released.

4.4.1.3.3 The HP/Chem Department has issued a Waste Gas Release

Permit per HPP-1622.2 that has been signed by the Health Physics/Chemistry Foreman, Supervisor of HP/Chem and the Shift Supervisor. The permit as been received by the Control Room Operator.

4.4.1.4 The Waste Gas Discharge Monitor, WDG-R-1480 is operating and has been verified by 2322-Q1 within the last quarter to close WDG-V30A and WDG-V30B on a high radiation signal.

4.4.1.5 The Waste Gas Decay Tank monitor, WDG-R-1485 (1486), for tank WDG-T-1A (B) to be released, is operating and has been verified by 2322-Q1 within the last quarter to close WDG-V30A (B) on a high radiation signal.

4.4.1.6 Unit 2 Exhaust Vent Gas Discahrge Monitor, HP-R-219, is operating and has been verified by 2322-Q3 within the last quarter to close WDG-V30A and WDG-V30B on a high radiation signal.

4.4.1.7 The following Meteorological Data is available:

4.4.1.7.1 The wind speed and direction at the 100 ft level of the meteorological monitoring tower.

4.4.1.7.2 The temperature difference between the 150 ft and 33 ft levels of the tower.

4.4.1.8 Obtain key from Shift Foreman for WDG-V54A(B).

4.4.1.9 HANG a "GAS RELEASE IN PROCESS" sign on the Waste Gas Disposal Panel.

4.4.1.10 The Waste Gas Release Permit, issued by the HP Department, shall be completed as required:

- ___ 4.4.1.10.1 Initial data.
- ___ 4.4.1.10.2 Subsequent data.
- ___ 4.4.1.10.3 Shift Supervisor verification.
- ___ 4.4.1.10.4 Returned to the HP Lab.
- ___ 4.4.1.11 The Waste Gas Release Data Sheet, Appendix C of these procedures, shall be completed as required:
 - ___ 4.4.1.11.1 Initial data.
 - ___ 4.4.1.11.2 Subsequent data, hourly.
 - ___ 4.4.1.11.3 Signed by the operator.
 - ___ 4.4.1.11.4 Returned to the Supervisor of Operation, Unit 2.
- ___ 4.4.1.12 OPEN WDG-V60, the Station Vent isolation valve.
- ___ 4.4.1.13 UNLOCK and OPEN WDG-54A(B) the manual outlet valve of the tank WDL-T1A(B) to be released.
- ___ 4.4.1.14 OPEN WDG-V30A (B) the outlet valve of the tank WDG-T-1A (B) to be released.
- ___ 4.4.1.15 CRACK OPEN and THROTTLE WDG-V188A (B), the outlet flow throttle valve. Control flow to less than 100 SCFM as read on WDG-FI-3652.

CAUTION: Do not discharge above 100 SCFM during waste gas release.
- ___ 4.4.1.16 CLOSE WDG-V188A (B) when the gas release has been completed.
- ___ 4.4.1.17 CLOSE WDG-V60.
- ___ 4.4.1.18 CLOSE WDG-V30A (B).
- ___ 4.4.1.19 CLOSE and LOCK WDG-V54A(B).
- ___ 4.4.1.20 REMOVE the tag hung in step 4.4.1.2.
- ___ 4.4.1.21 REMOVE the tag hung in step 4.4.1.8.

NOTE: The procedure is not complete until steps 4.4.1.10 and 4.4.1.11 have been completed.
- ___ 4.4.1.22 Return key for WDG-V54A(B) to Shift Foreman.

4.4.2 Shift of On-Line Decay Tank.

____ 4.4.2.1 CHECK to insure that the Vent Header pressure is near the low end of the operating band and that no large pressure surge is anticipated.

____ 4.4.2.2 PLACE the control switches in the OFF position for both compressors.

____ 4.4.2.3 CLOSE WDG-V26A (B), the inlet valve for the tank, WDG-T-1A (B) being charged.

____ 4.4.2.4 COMPLETE Section 4.1, Start-up. The shift of the On-Line Decay Tank occurs in step 4.1.2 when WDG-V26B (A) is opened.

4.4.3 Reuse of Waste Gas

The Waste Gas System allows for gas to be directed to the Reactor Coolant Bleed Hold-up Tanks. However, as presently designed, the transfer must be completed by manual control only.

CAUTION: Special care must be taken not to overpressurize a R.C. Bleed Hold-up Tank which has a design pressure of 20 psig.

____ 4.4.3.1 The Waste Gas Decay Tank, WDG-T-1A (B) selected for reuse is not being charged.

____ 4.4.3.2 HANG a "DO NOT OPERATE" tag on the tank inlet isolation valve, WDL-V26A (B), control switch.

____ 4.4.3.3 The following interfacing has been completed with the Health Physics Department.

____ 4.4.3.3.1 The HP/Chem Department has been notified that the Operations Department wants to reuse the Waste Gas in a Decay Tank.

____ 4.4.3.3.2 The HP/Chem Department has taken a sample of the tank to be reused.

____ 4.4.3.3.3 The HP/Chem Department has verbally stated that the gas conforms to the following specifications for reuse.

- a. Hydrogen \leq 3% by volume
- b. Oxygen \leq 0.1% by volume.
- c. The concentration of radioactive gas isotopes is less than the restricted MPC values in 10CFR20, Appendix B.

____ 4.4.3.4 CHECK CLOSE WDG-V60, the Station Vent isolation valve.

____ 4.4.3.5 OPEN WDG-V61, the Waste Gas Reuse Header isolation valve.

____ 4.4.3.6 OPEN WDG-V62A (B)(C) the isolation valve for WDL-T-1A (B)(C).

____ 4.4.3.7 Obtain key from Shift Foreman and UNLOCK and OPEN WDG-V54A(B).

____ 4.4.3.8 OPEN WDG-V30A (B) the outlet valve of the tank WDG-T-1A (B) to be reused.

____ 4.4.3.9 Monitor the RC Bleed Hold-up Tank pressure during this procedure.

CAUTION: Do not overpressurize the tank, the design pressure is 20 psig.

____ 4.4.3.10 CRACK OPEN and THROTTLE WDG-V188A (B), the outlet throttle valve. Control flow to less than 100 SCFM as read on WDG-FI-3652.

CAUTION: Do not exceed 100 SCFM during this procedure.

____ 4.4.3.11 CLOSE WDG-V188A (B) when the desired RC Bleed Hold-up Tank pressure is obtain. Must be less than 20 psig.

____ 4.4.3.12 CLOSE WDG-V30A (B).

____ 4.4.3.13 CLOSE and LOCK WDG-V54A(B).

___ 4.4.3.14 CLOSE WDG-V62A (B)(C).

___ 4.4.3.15 CLOSE WDG-V61.

___ 4.4.3.16 REMOVE the tag hung in step 4.4.3.2.

___ 4.4.3.17 Return WDG-V54A(B) key to Shift Foreman.

4.4.4 Decay Tank to Decay Tank Transfer.

___ 4.4.4.1 The sum of the gauge pressures of the two tanks total 110 psig or less.

CAUTION: If this condition is not met the transfer cannot be complete without the possibility of a relief valve lifting and discharging to the Station Vent. The transfer must be observed with special caution and stopped when the tank pressure reaches 110 psig.

___ 4.4.4.2 The Waste Gas System is in operation per Section 4.2, Normal Operation.

___ 4.4.4.3 CHECK OPEN WDG-V172, the Waste Gas Compressors discharge cross-connect valve.

___ 4.4.4.4 OPEN or CHECK OPEN WDG-V26A and WDG-V26B, the Decay Tank inlet isolation valves, to equalize the pressure in the tanks.

___ 4.4.4.5 CLOSE WDG-V26A (B) the inlet valve of the tank, WDG-T-1A (B), to be emptied after the pressure has equalized in the tanks.

___ 4.4.4.6 CHECK CLOSE WDG-V60 and WDG-V61, the release valves.

___ 4.4.4.7 OPEN WDG-V170 and WDG-V196, the isolation valves to regulating valve WDG-V171.

___ 4.4.4.8 OPEN WDG-V30A (B) the outlet valve of the tank to be emptied.

___ 4.4.4.9 Obtain key from Shift Foreman and Unlock and OPEN WDG-V54A(B).

- ___ 4.4.4.10 OPEN WDG-V188A (B) the outlet throttle valve.
- ___ 4.4.4.11 MONITOR the compressors suction pressure to ensure that the regulating valve, WDG-V171 is controlling the pressure.
- ___ 4.4.4.11 CLOSE WDG-V188A (B) when the transfer is complete.
- ___ 4.4.4.12 CLOSE and LOCK WDG-V54A(B).
- ___ 4.4.4.13 CLOSE WDG-V170 and WDG-V196.
- ___ 4.4.4.14 CLOSE WDG-V30A(B).
- ___ 4.4.4.15 Return WDG-V54A(B) key to Shift Foreman.

CAUTION: The empty tank still will be pressurized and must be treated as such.

4.4.5 Reactor Building Vent Header Start-up.

- ___ 4.4.5.1 The Reactor is shutdown for maintenance and/or refueling.
- ___ 4.4.5.2 OPEN WDG-V2, the inside containment isolation valve.
- ___ 4.4.5.3 OPEN WDG-V199, the outside containment isolation valve.
- ___ 4.4.5.4 OPEN WDG-V6, the Reactor Building Vent Header isolation valve.

4.4.6 Reactor Building Vent Header Shutdown.

- ___ 4.4.6.1 CLOSE WDG-V6, the Reactor Building Vent Header isolation valve.
- ___ 4.4.6.2 CLOSE WDG-V199, the outside containment isolation valve.
- ___ 4.4.6.3 CLOSE WDG-V2, the inside containment isolation valve.

4.4.7 Vent Header to Station Vent By-Pass.

CAUTION: This operation is only performed if there is a large volume of gas to be released which is at or below the allowable discharge limits.

- ___ 4.4.7.1 The following interfacing has been completed with the Health Physics Department:
 - ___ 4.4.7.1.1 The HP/Chem Department has been notified that the Operations Department wants to release waste gas.

____ 4.4.7.1.2 The HP/Chem Department has taken a sample of the gas to be released.

____ 4.4.7.1.3 The HP/Chem Department has issued a Waste Gas Release Permit per HPP-1622.2 that has been signed by the Health Physics/Chemistry Foreman, Supervisor of HP/Chem and the Shift Supervisor. The permit has been received by the Control Room Operation.

____ 4.4.7.2 The Waste Gas Discharge Monitor, WDG-R-1480 is operating.

____ 4.4.7.3 Unit 2 Exhaust Vent Gas Discharge Monitor HP-R-219 is operating.

CAUTION: There is no automatic action that will secure the discharge on a high radiation signal. The operator must secure the flow by closing WDG-V60, the station vent isolation valve.

____ 4.4.7.4 The following Meteorological Data is available:

____ 4.4.7.4.1 The wind speed and direction at the 100 ft level of the meteorological monitoring tower.

____ 4.4.7.4.2 The temperature difference between the 150 ft and 33 ft levels of the tower.

____ 4.4.7.5 HANG a "GAS RELEASE IN PROGRESS" sign on the Waste Disposal Panel.

____ 4.4.7.6 The Waste Gas Release Permit, issued by the HP/Chem Department, shall be completed as required.

____ 4.4.7.6.1 Initial data.

____ 4.4.7.6.2 Subsequent Data.

____ 4.4.7.6.3 Shift Supervisor verification.

- ____ 4.4.7.6.4 Returned to the H.P. Lab.
- ____ 4.4.7.7 The Waste Gas Release Data Sheet, Appendix C of these procedures, shall be completed as required.
- ____ 4.4.7.7.1 Initial data.
- ____ 4.4.7.7.2 Subsequent data, hourly.
- ____ 4.4.7.7.3 Signed by the Operator.
- ____ 4.4.7.7.4 Returned to the Supervisor of Operations, Unit 2.
- ____ 4.4.7.8 Obtain key and OPEN WDG-V24, the locked closed bypass valve of WDG-V171.
- ____ 4.4.7.9 OPEN WDG-V60, the Station Vent isolation valve.
- ____ 4.4.7.10 CRACK OPEN and THROTTLE the valve at the source of the gas.
- CAUTION: Do not discharge above 100 SCFM during waste gas release as read on WDG-FI-3652.
- ____ 4.4.7.11 CLOSE the valve at the source of the gas when the release is complete.
- ____ 4.4.7.12 CLOSE WDG-V60.
- ____ 4.4.7.13 CLOSE WDG-V24 and Lock Closed.
- ____ 4.4.7.14 REMOVE the sign hung in step 4.4.7.5.
- ____ 4.4.7.15 Return WDG-V24 key to Shift Foreman.
- NOTE: The procedure is not complete until steps 4.4.7.6 and 4.4.7.7 have been completed.
- ____ 4.4.8 Compressor - Decay Tank Train Shutdown and Purge.
- The Waste Gas System is not normally shutdown with the exception of the Reactor Building Vent Header. The following procedure secures one Waste Gas Compressor and the associated Decay Tank and purges the tank to allow maintenance in the compartment. In order to shutdown

both trains, complete the following procedure for each train. All other system shutdowns with purge should be evaluated individually to determine the best procedure.

____ 4.4.8.1 EMPTY and PURGE WDG-T-1A (B) by ONE OF the following four methods.

____ 4.4.8.1.1 Alternative Method I, Release and Purge to Station Vent.

____ 4.4.8.1.1.1 COMPLETE Section 4.4.1, Decay Tank Discharge to the Station Vent, through step 4.4.1.13.

____ 4.4.8.1.1.2 SLOWLY OPEN WDG-V69A (B), the nitrogen make-up valve of the tank to be purged.

CAUTION: Do not exceed 100 SCFM release rate.

____ 4.4.8.1.1.3 CLOSE WDG-V69A (B) when the purge is completed.

____ 4.4.8.1.1.4 FINISH Section 4.4.1 starting with step 4.4.1.14.

____ 4.4.8.1.1.5 CONTINUE this procedure with step 4.4.8.2.

____ 4.4.8.1.2 Alternative Method II, Release to Station Vent and Purge to Other Tank.

____ 4.4.8.1.2.1 COMPLETE Section 4.4.1, Decay Tank Discharge to the Station Vent.

____ 4.4.8.1.2.2 COMPLETE Section 4.4.4, Decay Tank to Decay Tank Transfer, through step 4.4.4.10.

____ 4.4.8.1.2.3 SLOWLY OPEN WDG-V69A (B), the nitrogen make-up valve of the tank to be purged.

____ 4.4.8.1.2.4 CLOSE WDG-V69A (B) when the purge is completed.

____ 4.4.8.1.2.5 FINISH Section 4.4.4 starting with step 4.4.4.11.

____ 4.4.8.1.2.6 CONTINUE this procedure with step 4.4.8.2.

____ 4.4.8.1.3 Alternative Method III, Transfer and Purge to Other Tank.

- ____ 4.4.8.1.3.1 COMPLETE Section 4.4.4, Decay Tank to Decay Tank Transfer, through step 4.4.4.10.
 - ____ 4.4.8.1.3.2 SLOWLY OPEN WDG-V69A (B), the nitrogen make-up valve of the tank to be purged.
 - ____ 4.4.8.1.3.3 CLOSE WDG-V69A (B) when the purge is completed.
 - ____ 4.4.8.1.3.4 FINISH Section 4.4.4 starting with step 4.4.4.11.
 - ____ 4.4.8.1.3.5 CONTINUE this procedure with step 4.4.8.2.
 - ____ 4.4.8.1.4 Alternate Method IV, Transfer to Other Tank and Purge to Station Vent.
 - ____ 4.4.8.1.4.1 COMPLETE Section 4.4.4, Decay Tank to Decay Tank Transfer.
 - ____ 4.4.8.1.4.2 SLOWLY OPEN WDG-V69A (B), the nitrogen make-up valve to dilute the residue waste gas in tank WDG-T-1A (B).
 - ____ 4.4.8.1.4.3 CLOSE WDG-V69A (B) when the desired pressure is reached.
 - ____ 4.4.8.1.4.4 COMPLETE step 4.4.8.1.1, Alternative Method I, Release and Purge to Station Vent.
- CAUTION: If the sample indicates that the diluted gas still cannot be released, then go to step 4.4.8.1.3, Alternative Method III, Transfer and Purge to Other Tank.
- ____ 4.4.8.2 PLACE the Control Switch in the OFF position for the compressor, WDG-P-1A (B) associated with the purged tank, WDG-T-1A (B).
 - ____ 4.4.8.3 OPEN the breaker for the compressor stopped in step 4.4.8.2. ONE of the following:

<u>Initial</u>	<u>Breaker</u>	<u>Compressor</u>
_____	7CF on MCC 2-32A	WDG-P-1A
_____	7BF on MCC 2-42A	WDG-P-1B

____ 4.4.8.4 CLOSE WDG-V172, the compressors discharge cross-connect valve.

____ 4.4.8.5 CLOSE WDG-V124A (B), WDG-V57A (B), and WDG-V129A (B) to isolate the compressor, WDG-P-1A (B).

4.4.9 Emergency Operations.

In an emergency the Waste Gas System functions as in the Normal Operations.

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APPENDIX A

Start-Up Valve Line-up

Valve Number	Description	Position	Initial
WDG-V1A	CRDM Vent Isolation	CL	_____
WDG-V1B	CRDM Vent Isolation	CL	_____
WDG-V2	Inside Containment Isolation	CL	_____
WDG-V6	R.B. Vent Hdr Isolation	CL	_____
WDG-V16	Aux Bldg Sump Tk Vent Isolation	OP	_____
WDG-V17A	Spent Resin Stor Tk - 1A Vent Isolation	OP	_____
WDG-V17B	Spent Resin Stor Tk - 1B Vent Isolation	OP	_____
WDG-V24	Vent Hdr to Waste Gas Flt By-Pass	L.CL	_____
WDG-V26A	Decay Tk - 1A Inlet Flow Control	CL	_____
WDG-V26B	Decay Tk - 1B Inlet Flow Control	CL	_____
WDG-V28A	Decay Tk - 1A Drain Control	CL	_____
WDG-V28B	Decay Tk - 1B Drain Control	CL	_____
WDG-V29A	Decay Tk - 1A Sample	CL	_____
WDG-V29B	Decay Tk - 1B Sample	CL	_____
WDG-V30A	Decay Tk - 1A Outlet Control	CL	_____
WDG-V30B	Decay Tk - 1B Outlet Control	CL	_____
WDG-V32	Flt Inlet Isol.	OP	_____
WDG-V33	Flt Upstream Line Drain	CL	_____
WDG-V34	Flt Downstream Line drain	CL	_____
WDG-V35	Flt Outlet Isol	OP	_____
WDG-V39	PX - Test Connection Isolation	CL	_____
WDG-V40	Vent Hdr Press Inst Root	OP	_____
WDG-V47A	Decay Tk - 1A Press Instr Root	OP	_____
WDG-V47B	Decay Tk - 1B Press Instr Root	OP	_____

Start-Up Valve Line-up

Valve Number	Description	Position	Initial
WDG-V49	Flt DPT Instr. Upstream Root	OP	_____
WDG-V54A	Decay Tk - 1A Outlet Isolation	L. CL	_____
WDG-V54B	Decay Tk - 1B Outlet Isolation	L. CL	_____
WDG-V55A	Decay Tk - 1A Inlet Isolation	OP	_____
WDG-V55B	Decay Tk - 1B Inlet Isolation	OP	_____
WDG-V57A	Compress - 1A Inlet Isolation	OP	_____
WDG-V57B	Compress - 1B Inlet Isolation	OP	_____
WDG-V59	Vent Header to Compress Press Regulator	AUTO	_____
WDG-V60	Filter to Station Vent Isolation	CL	_____
WDG-V61	Filter to RC Bleed Hold-Up Tks Hdr Isolation	CL	_____
WDG-V62A	Gas to RC Bleed Hold-up Tk - 1A Control	CL	_____
WDG-V62B	Gas to RC Bleed Hold-up Tk - 1B Control	CL	_____
WDG-V62C	Gas to RC Bleed Hold-up Tk - 1C Control	CL	_____
WDG-V64	Compress - 1A Vent Hdr Press Instr Root	OP	_____
WDG-V65	Conc Waste Tk Vent Control	OP	_____
WDG-V66	Compress Inlet Press Instr Root	OP	_____
WDG-V67	Filter d-Press Instr Downstream Root	OP	_____
WDG-V68	Compress - 1B Vent Hdr Press Instr Root	OP	_____
WDG-V69A	Nitrogen to Decay Tk - 1A Isolation	CL	_____
WDG-V69B	Nitrogen to Decay Tk - 1B Isolation	CL	_____
WDG-V70	Nitrogen to Vent Hdr Isolation	CL	_____
WDG-V71	Filter Drain Hdr Drain	CL	_____
WDG-V72A	Compress - 1A Unloader	AUTO	_____
WDG-V72B	Compress - 1B Unloader	AUTO	_____

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Start-Up Valve Line-up

Valve Number	Description	Position	Initial
WDG-V74A	Compress - 1A Auto Hi-Level Drain	AUTO	_____
WDG-V74B	Compress - 1B Auto Hi-Level Drain	AUTO	_____
WDG-V76A	Compress - 1A Manual Drain	CL	_____
WDG-V76B	Compress - 1B Manual Drain	CL	_____
WDG-V83A	Compress - 1A Inlet Regulator	AUTO	_____
WDG-V83B	Compress - 1B Inlet Regulator	AUTO	_____
WDG-V84A	Compress - 1A Inlet Control Regulator	AUTO	_____
WDG-V84B	Compress - 1B Inlet Control Regulator	AUTO	_____
WDG-V85A	Compress - 1A Auto Lo-Level Makeup	AUTO	_____
WDG-V85B	Compress - 1B Auto Lo-Level Makeup	AUTO	_____
WDG-V90	Rec Boric Acid Tk Vent Control	OP	_____
WDG-V100A	Spent Resin Stor Tk - 1A Vent Isolation	OP	_____
WDG-V100B	Spent Resin Stor Tk - 1B Vent Isolation	OP	_____
WDG-V114	Conc Waste Tk Vent Isolation	OP	_____
WDG-V116A	RC Bleed Holdup Tk - 1A Vent Isolation	OP	_____
WDG-V116B	RC Bleed Holdup Tk - 1B Vent Isolation	OP	_____
WDG-V116C	RC Bleed Holdup Tk - 1C Vent Isolation	OP	_____
WDG-V117	Rec Boric Acid Tk Vent Isolation	OP	_____
WDG-V118	Liquid Drainer - U11A Inlet Isolation	OP	_____
WDG-V119	Nitrogen to RC Bleed Holdup Tks Isolation	CL	_____
WDG-V121	Liquid Drainer - U12A Inlet Isolation	OP	_____
WDG-V122	Liquid Drainer - U12B Outlet Isolation	OP	_____
WDG-V123	Compress Combine Inlet Isolation	OP	_____
WDG-V124A	Compress - 1A Inlet Isolation	OP	_____

APPENDIX A

Start-Up Valve Line-up

Valve Number	Description	Position	Initial
WDG-V124B	Compress - 1B Inlet Isolation	OP	_____
WDG-V127	Nitrogen to Decay Tk 1B Sample Line	CL	_____
WDG-V128A	Compress - 1A Unloader Valve Isolation	OP	_____
WDG-V128B	Compress - 1B Unloader Valve Isolation	OP	_____
WDG-V129A	Compress - 1A Inlet Control Regulator Isol	OP	_____
WDG-V129B	Compress - 1B Inlet Control Regulator Isol	OP	_____
WDG-V134A	Compress - 1A Makeup Water Isolation	OP	_____
WDG-V134B	Compress - 1B Makeup Water Isolation	OP	_____
WDG-V135A	Decay Tk - 1A Press Instr Drain	CL	_____
WDG-V135B	Decay Tk - 1B Press Instr Drain	CL	_____
WDG-V136	Filter Drain Isolation	CL	_____
WDG-V138	Liquid Drainer - U8A Inlet Isolation	OP	_____
WDG-V139	Liquid Drainer - U8A Outlet Isolation	OP	_____
WDG-V140	Liquid Drainer - U9A Inlet Isolation	OP	_____
WDG-V141	Liquid Drainer - U9A Outlet Isolation	OP	_____
WDG-V142A	Decay Tk - 1A Outlet Rad Instr Root	OP	_____
WDG-V142B	Decay Tk - 1B Outlet Rad Instr Root	OP	_____
WDG-V143A	Decay Tk - 1A Outlet Rad Instr Root	OP	_____
WDG-V143B	Decay Tk - 1B Outlet Rad Instr Root	OP	_____
WDG-V145	Station Vent Discharge Rad Instr Root	OP	_____
WDG-V146	Station Vent Discharge Rad Instr Root	OP	_____
WDG-V147	Nitrogen to Decay Tk - 1A Sample Line	CL	_____
WDG-V149	Filter d-Press Instr Upstream Root	OP	_____
WDG-V150	Filter d-Press Instr Downstream Root	OP	_____

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Start-Up Valve Line-up

Valve Number	Description	Position	Initial
WDG-V151	RC Evap Vent Isolation	OP	_____
WDG-V152	RC Evap Vent Isolation	OP	_____
WDG-V154	RC Evap Vent Isolation	OP	_____
WDG-V157	Nitrogen to RB Vent Hdr	CL	_____
WDG-V159	Liquid Drainer - U10A Inlet Isolation	OP	_____
WDG-V160	Liquid Drainer - U10A Outlet Isolation	OP	_____
WDG-V162A	Compress - 1A Outlet Press Instr Root	OP	_____
WDG-V162B	Compress - 1B Outlet Press Instr Root	OP	_____
WDG-V164	Liquid Drainer - U11A Outlet Isolation	OP	_____
WDG-V165	Pressurizer Vent Isolation	CL	_____
WDG-V166A	Steam Gen - 1A Pri-side Vent Isolation	CL	_____
WDG-V166B	Steam Gen - 1B Pri-side Vent Isolation	CL	_____
WDG-V167A	Steam Gen - 1A Sec-side Vent Isolation	L.CL	_____
WDG-V167B	Steam Gen - 1B Sec-side Vent Isolation	L.CL	_____
WDG-V170	Decay Tk to Vent Hdr Regulator Isolation	CL	_____
WDG-V171	Decay Tk to Vent Hdr Regulator	AUTO	_____
WDG-V172	Compress Discharge Cross-Connect	OP	_____
WDG-V174	Decay Tk - 1A Level Instr Top Isolation	OP	_____
WDG-V175	Decay Tk - 1A Level Instr Top Root	OP	_____
WDG-V176	Decay Tk - 1A Level Instr Bot Root	OP	_____
WDG-V177	Decay Tk - 1A Level Instr Bot Isolation	OP	_____
WDG-V178	Decay Tk - 1B Level Instr Top Isolation	OP	_____
WDG-V179	Decay Tk - 1B Level Instr Top Root	OP	_____
WDG-V180	Decay Tk - 1B Level Instr Bot Root	OP	_____

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Start-Up Valve Line-up

Valve Number	Description	Position	Initial
WDG-V181	Decay Tk - 1B Level Instr Bot Isolation	OP	_____
WDG-V182	Decay Tk - 1A Level Instr Bot Root	OP	_____
WDG-V183	Decay Tk - 1A Level Instr Top Root	OP	_____
WDG-V184	Decay Tk - 1B Level Instr Bot Root	OP	_____
WDG-V185	Decay Tk - 1B Level Instr Top Root	OP	_____
WDG-V186	Containment Isolation Test Isolation	CL	_____
WDG-V187	Containment Isolation Test Isolation	CL	_____
WDG-V188A	Decay Tk - 1A Outlet Throttle	CL	_____
WDG-V188B	Decay Tk - 1B Outlet Throttle	CL	_____
WDG-V189	Vent Hdr to Sample Isolation	CL	_____
WDG-V191	Containment Isolation Test Isolation	CL	_____
WDG-V192	Containment Isolation Test Isolation	CL	_____
WDG-V193	Vent Hdr Regulator Downstream Isolation	OP	_____
WDG-V194	Vent Hdr Regulator Upstream Isolation	OP	_____
WDG-V195	Vent Hdr Regulator Bypass	CL	_____
WDG-V196	Decay Tk to Vent Hdr Regulator Isolation	CL	_____
WDG-V197	Vent Hdr Regulator Root	OP	_____
WDG-V199	Outside Containment Isolation	CL	_____
WDG-V200	Liquid Drainer - U24 Inlet Isolation	OP	_____
WDG-V201	Liquid Drainer - U24 Outlet Isolation	OP	_____
WDG-V202	Liquid Drainer - U25 Inlet Isolation	OP	_____
WDG-V203	Liquid Drainer - U25 Outlet Isolation	OP	_____
WDG-V204	Liquid Drainer - U26 Inlet Isolation	OP	_____
WDG-V205	Liquid Drainer - U26 Outlet Isolation	OP	_____

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Start-Up Valve Line-up

Valve Number	Description	Position	Initial
WDG-V206	Rad Sampling Rack Isolation	CL	_____
WDG-V207	Rad Sampling Rack Isolation	CL	_____
WDG-V208	Rad Sampling Rack Bypass	OP	_____
WDL-V126	RC Drain Tk Vent Isolation	CL	_____
WDL-V127	RC Drain Tk Vent Isolation	CL	_____
CF-V3A	Core Flood Tk - 1A Vent Isolation	CL	_____
CF-V3B	Core Flood Tk - 1B Vent Isolation	CL	_____
CF-V117A	Core Flood Tk - 1A Vent Isolation	CL	_____
CF-V117B	Core Flood Tk - 1B Vent Isolation	CL	_____
MU-V234A	Seal Return Cooler - 2A Vent Isolation	CL	_____
MU-V234B	Seal Return Cooler - 2B Vent Isolation	CL	_____
MU-V358A	Seal Return Cooler - 2A Vent Isolation	CL	_____
MU-V358B	Seal Return Cooler - 2B Vent Isolation	CL	_____
MU-V116A	Makeup and Purif Demin - 1A Vent Isolation	CL	_____
MU-V116B	Makeup and Purif Demin - 2A Vent Isolation	CL	_____
MU-V217A	Makeup and Purif Demin - 1A Vent Isolation	CL	_____
MU-V217B	Makeup and Purif Demin - 2A Vent Isolation	CL	_____
MU-V13	Makeup Tk Vent Isolation	CL	_____
MU-V136	Makeup Tk Vent Isolation	CL	_____
MU-V227A	Makeup & Purif Demin Flt - 5A Vent Isol	CL	_____
MU-V227B	Makeup & Purif Demin Flt - 5B Vent Isol	CL	_____
MU-V228A	Makeup & Purif Demin Flt - 5A Vent Isol	CL	_____
MU-V228B	Makeup & Purif Demin Flt - 5B Vent Isol	CL	_____
SF-V187	Spent Fuel Demin Vent Isolation	CL	_____

APPENDIX A

Start-Up Valve Line-up

Valve Number	Description	Position	Initial
SF-V197	Spent Fuel Demin Vent Isolation	CL	_____
SF-V119A	Spent Fuel Flt - 1A Vent Isolation	CL	_____
SF-V119B	Spent Fuel Flt - 1B Vent Isolation	CL	_____
SF-V196A	Spent Fuel Flt - 1A Vent Isolation	CL	_____
MU-V131A	Makeup Flt - 2A Vent Isolation	CL	_____
MU-V131B	Makeup Flt - 2B Vent Isolation	CL	_____
SF-V196B	Spent Fuel Flt - 1B Vent Isolation	CL	_____
WDL-V355A	RB Sump Pump Flt - 8A Vent Isolation	CL	_____
WDL-V355B	RB Sump Pump Flt - 8B Vent Isolation	CL	_____
WDL-V356A	RB Sump Pump Flt - 8A Vent Isolation	CL	_____
WDL-V356B	RB Sump Pump Flt - 8B Vent Isolation	CL	_____
WDL-V256	Misc Waste Tk Vent Isolation	OP	_____
WDL-V68A	Deborating Demin - 1A Vent Isolation	CL	_____
WDL-V68B	Deborating Demin - 1B Vent Isolation	CL	_____
WDL-V532A	Deborating Demin - 1A Vent Isolation	CL	_____
WDL-V532B	Deborating Demin - 1B Vent Isolation	CL	_____
WDL-V378A	Aux Bldg Sump Tk Flt - 3A Vent Isolation	CL	_____
WDL-V378B	Aux Bldg Sump Tk Flt - 3B Vent Isolation	CL	_____
WDL-V379A	Aux Bldg Sump Tk Flt - 3A Vent Isolation	CL	_____
WDL-V379B	Aux Bldg Sump Tk Flt - 3B Vent Isolation	CL	_____
WDL-V375A	Neutr Tk Flt - 4A Vent Isolation	CL	_____
WDL-V375B	Neutr Tk Flt - 4B Vent Isolation	CL	_____
WDL-V26A	RC Bleed Holdup Tk - 1A Vent Isolation	OP	_____
WDL-V26B	RC Bleed Holdup Tk - 1B Vent Isolation	OP	_____

APPENDIX A

Start-Up Valve Line-up

Valve Number	Description	Position	Initial
WDL-V20C	RC Bleed Holdup Tk - 1C Vent Isolation	OP	_____
WDL-V57A	Cleanup Demin - 2A Vent Isolation	CL	_____
WDL-V57B	Cleanup Demin - 2B Vent Isolation	CL	_____
WDL-V514A	Cleanup Demin - 2A Vent Isolation	CL	_____
WDL-V514B	Cleanup Demin - 2B Vent Isolation	CL	_____
WDL-V201A	Cleanup Flt - 9A Vent Isolation	CL	_____
WDL-V201B	Cleanup Flt - 9B Vent Isolation	CL	_____
WDL-V202A	Cleanup Flt - 9A Vent Isolation	CL	_____
WDL-V202B	Cleanup Flt - 9B Vent Isolation	CL	_____