

DESCRIPTION OF CHARCOAL REMOVAL,
SYSTEM DRYING AND REPLACEMENT
CARBON INSTALLATION ACTIVITIES

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Charcoal Removal, System Drying and Installation Of New Charcoal In The N64
Off-Gas Processing System Adsorber Beds

Detailed reviews of temperature data, effluent sample data, charcoal heat transfer characteristics and charcoal adsorption and desorption characteristics have been performed. These additional reviews have confirmed that adsorber beds 14A and 14B experienced combustion during the July 6, 1986 event. These reviews have also revealed the possibility of combustion activity in adsorber beds 15A and 15B. Based upon the fact that the 14A and 14B beds had been inerted with N_2 for a period of approximately thirteen (13) days from the previous event and again combusted upon experiencing instrument air flow, the decision was made to completely empty all adsorber beds to prevent any further combustion activity and to assure suitability of the replacement charcoal material for use during plant operations.

The "A" afterfilter was in the process flow path during the initial combustion event. This afterfilter was removed, inspected and reinstalled after the extinguishment of the initial combustion event. No contamination on this afterfilter was found.

A detailed Maintenance Temporary Instruction (MTI)-0006 - Unloading, Drying and Loading of N64 Charcoal Adsorber Vessels, (Attachment 1), was developed for removal of the charcoal from all adsorber beds. The NRC was given prior notification and provided concurrence before charcoal removal activities commenced.

The charcoal was removed from adsorber bed vessels 13A, 13B, 14A, 14B, 15A and 15B in a wetted condition and from adsorber bed vessels 12A and 12B in a dry condition. A vacuum device was employed to suction the charcoal from the vessels. Integral to the vacuum device was a water eductor for mixing demineralized water of sufficient flow with the charcoal in the suction stream of the hose to further ensure quenching of potentially hot charcoal. Refer to Figure 3 in the Recovery Plan for the configuration of the "dry" method of charcoal removal and Figure 4 in the Recovery Plan for the configuration of the "wet" method of charcoal removal.

The charcoal in adsorber beds 13A, 13B, 14A, 14B, 15A and 15B was wetted by a spray device, supplied by demineralized water, attached to the suction hose while the charcoal was being removed from the vessels.

The charcoal in adsorber beds 12A and 12B was removed by suctioning without a spray device. Charcoal wetting in adsorber beds 12A and 12B was determined to be both unnecessary and undesirable. The charcoal in adsorber beds 12A and 12B experienced no combustion and had experienced the longest and most efficient N_2 purge. The charcoal from each adsorber bed was transported from the vacuum device to the receiving truck containing water for additional quenching.

Atmospheric monitoring of the area was conducted to ensure a habitable atmosphere existed prior to vault entry. Temporary water hoses were staged at the adsorber bed vessel loading flange areas of adsorber bed vessels 13A, 13B, 14A, 14B, 15A and 15B with water supplied from the demineralized water system (P21).

Establishment of fire protection measures included staging of CO₂ fire extinguishers in the area with one (1) right next to each adsorber cover area. Also water fire suppression was available via a charged fire hose.

Upon establishment of the N₂ blanket, the thermocouples were removed from the adsorber beds and replaced with blank flanges. The hydrostatic test connection flanges at the bottom of adsorber bed vessels 13A, 13B, 14A, 14B, 15A and 15B were removed to allow excess water drainage into the temporary dewatering system. Upon completion of the test connection flange removal, the adsorber bed vessel loading flanges for all adsorber beds were removed. Using the temporary water hoses, a water spray was initiated into adsorber beds 13A, 13B, 14A, 14B, 15A and 15B such that the entire cross section of the adsorber bed was continually wetted. The water spray was continued until approximately the first three (3) feet of each adsorber bed 13A, 13B, 14A, 14B, 15A and 15B, (approximately 100 gallons of water), had been wetted. This wetting was done to quench any remaining "hot spots" within the first three (3) feet of the bed in preparation for charcoal removal.

Upon emptying each adsorber bed, a visual and television camera examination of the adsorber bed vessel internal surfaces was performed to ensure charcoal material was removed to the maximum extent possible and to photographically document the condition of the vessel internals.

Upon completion of the charcoal removal process for all adsorber beds in the A and B trains, a general area cleanup and demobilization of charcoal removal equipment was completed. The system was drained of any excess water and additional drain points were established. Upon completion of system draining, the adsorber bed vessel loading flanges and the hydrostatic test connection flanges were reinstalled.

Upon completion of the demobilization and system boundary restoration, a drying process of the adsorber bed vessels and piping was initiated. The drying activities consist of a warm dry air purge of the system. Moisture content of the drying air is being sampled regularly.

Upon completion of the drying process, the air purge will be secured and the area and adsorber bed vessels will be readied for charcoal installation. Rigid environmental controls will be established to ensure no charcoal contamination occurs. The NRC will be given prior notification before charcoal installation activities commence. The adsorber bed vessels will be refilled using the Maintenance Temporary Instruction (MTI)-0006 - Unloading, Drying and Loading of N64 Charcoal Adsorber Vessel. A Nuclear Consulting Services representative will be present during portions of the carbon loading operation to provide assistance as required.

ATTACHMENT 1

Maintenance Temporary Instruction - (MTI) - 0006

Unloading, Drying and Loading of N64 Charcoal Adsorber Vessels