TA 50

# Changes, Upgrades, Maintenance to the LANL Controlled-Air Incinerator

16-Feb-95



| ID | TITLE | SYSTEM AFFECTED | DESCRIPTION | CATEGORY | Permit modification required??? | JUSTIFICATION |
|---|---|---|---|---|---|---|
| 7 | **Absorption Column Maintenance** | Absorption Column | Replacement of packing with structured Hastelloy C-276 packing. Replacement packing has a higher specific surface area.<br>References: Revised Part B Application; Kaiser Report | Maintenance | No | Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit. |
| 6 | **Absorption Column Size Increase** | Absorption Column | Column diameter increased from 24 inches to 30 inches.<br>References: Revised Part B Application; Kaiser Report | Upgrade | No | Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit. |
| 42 | **Material Change** | Absorption Column | Material changed from FRP to Hastelloy.<br>References: Revised Part B Application; Kaiser Report | Upgrade | No | Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit. |

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| 8 | **Scrub Solution Flow Increase** | Absorption Column | Increase in liquid flow rate 7 gpm to 20-25 gpm.<br><br>References: Revised Part B Application; Kaiser Report | Process change | No | Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit. |
| 18 | **Ash Handling System Redesign** | Ash Handling System | Ash handling system modified from a vacuum removal and conveyance system to a gravity dropout and removal system.<br><br>References: Revised Part B Application | Upgrade | No | Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit. |
| 30 | **Air Locks** | CAI Building | Personnel and material air locks are being added and roll up doors replaced to comply with DOE Order 6430.1A (Containment Criteria).<br><br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | None | No | The change described does not pertain to the authorized unit as described in Permit Module V. |

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| 43 | **Ash Pit** | CAI Building | A pit to accomodate the gravity ash drop out and removal system has been constructed under the primary combustion chamber.<br><br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | None | No | The change described does not pertain to the authorized unit as described in Permit Module V. |
| 39 | **Building Exhaust** | CAI Building | New building exhaust fan expansion joints constructed to replace deteriorated joints.<br><br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | None | No | The change described does not pertain to the authorized unit as described in Permit Module V. |
| 46 | **Building HVAC** | CAI Building | Replacement of the existing building evaporative cooler with a mechanical chiller system. Ventilation control upgrades including new PLC based data aquisition and connection to main CAI control room for process area, high bay, and storage bay exhaust sy<br><br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | None | No | The change described does not pertain to the authorized unit as described in Permit Module V. |

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| 44 | **Siesmic Upgrades** | CAI Building | TA-50-37 may be structurqally upgraded to withstand a more intense design earthquake.<br><br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | None | No | The change described does not pertain to the authorized unit as described in Permit Module V. |
| 54 | **Combustion Air Blower Replacement** | Combustion Chamber | Replacement of combustion air blowers with flanged units of same type (performed to allow for addition of HEPA filters to flange). Combustion air glovebox face removed. (Necessary due to control valve size changes occuring in this glovebox.)<br><br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Upgrade | No | Replacement units are identical except for the flange. The change from indirect HEPA filtration of the glovebox to direct HEPA filtration on the blower provides filtration of combustion air equivalent to the previous condition (ie., functionally equivalent component change. 53 FR 37930, September 28, 1988) |
| 47 | **Hearth Sweep-out System Addition** | Combustion Chamber | IGOR (Integrated Glovebox-Operated Robotics) system for hearth sweep-out and inspection of PCC, SCC and main duct added.<br><br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Upgrade | No | The system upgrade is not used during incinerator operation (it is used mainly to clean ash off the incinerator hearth). Therefore it has no effect on DRE or any other relevant incinerator parameters. |

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| 86 | **Liquid Injection Burner Modification** | Combustion Chamber | The high-intensity vortex liquid burner will be enclosed in a glovebox to provide containment when servicing the component. Due to space limitations, the burner must be altered from the original design. The new burner has been specfied to function exactly as the former burner design, and testing and third-party verification of equivalent performance will be perfromed and provided.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Upgrade | No | This component is specified to perform exactly as the unit which it replaces. Replacement of components with functionally equivalent components does not require a modification unless a permit condition is affected (53 FR 37930, September 28, 1988). |
| 59 | **Flow Meter Replacement** | Combustion Chambers | Replacement of combustion air and natural gas flow indicators (hot wire anemometers) with venturi flow tubes and Foxboro flow totalizers.<br>References: Revised Part B Application | Maintenance | No | Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit. |
| 14 | **Lower Burner Removal** | Combustion Chambers | Removal of primary combustion chamber gas-fired lower burner, because of the addition of the liquid injection vortex burner.<br>References: Revised Part B Application | Process change | No | Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit. |

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| 33 | **Demister Relocation** | Demister | Move demister closer to absorber column and replace with Hastelloy unit.<br><br>References: Revised Part B Application; Kaiser Report | Upgrade | No | Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit. |
| 34 | **Heat Exchanger Addition** | Heat Exchanger | Addition of heat exchanger to scrub solution recycle.<br><br>References: Revised Part B Application; Kaiser Report | Upgrade | No | Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit. |
| 38 | **Material Change** | Heat Exchanger | Material and size change on existing process liquid heat exchanger.<br><br>References: Revised Part B Application | Upgrade | No | Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit. |

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| 52 | **HEPA Bank Addition** | HEPA Filters | Second stage HEPA filter bank duplicated with the addition of a parallel filter plenum.<br><br>References: Revised Part B Application; Kaiser Report | Upgrade | No | Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit. |
| 53 | **HEPA Filter Housing Redesign** | HEPA Filters | Redesign and replacement of HEPA filter housing by placing filters in separate, individually accessible enclosures.<br><br>References: Revised Part B Application | Upgrade | No | Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit. |
| 49 | **Material Change** | HEPA Filters | Third-stage HEPA to be moved and housing replaced with 316L stainless steel.<br><br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Maintenance | No | Material substitution as part of normal maintenance. Unit moved physically, but not relative to other unit processes; therefore the process and process diagram does not change. |
| 51 | **Backup Power** | Instrumentation and Controls | A new uninterruptible power supply and new transfer switching equipment have been installed to replace aging battery packs.<br><br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Maintenance | No | Maintenance items are not modifications (53 FR 37924, September 28, 1988). |

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| 15 | **Burner Control Logic Enhancement** | Instrumentation and Controls | Addition of control loop to compensate for changes in the liquid waste supply which will adjust for differing liquid waste combustion air requirements.<br><br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Upgrade | No | Replacement of equipment with functionally equivalent components is a modification only if the permit is affected by such change. Addition of automatic process control to formerly manually or mechanically operated system is a functionally equivalent component replacement. (53 FR 37930, September 28, 1988) |
| 2 | **Burner Control Logic Enhancement** | Instrumentation and Controls | Addition of lead-lag logic control for fuel-to-air ratio control to compensate for sluggish air supply response versus rapid fuel supply response.<br><br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Upgrade | No | Replacement of equipment with functionally equivalent components is a modification only if the permit is affected by such change. Addition of automatic process control to formerly manually or mechanically operated systems is a functionally equivalent component replacement. (53 FR 37930, September 28, 1988) |
| 16 | **Burner Control Logic Enhancement** | Instrumentation and Controls | Removal of mechanical linkage control of fuel and combustion air so these may be controlled independently and automatically.<br><br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Upgrade | No | Replacement of equipment with functionally equivalent components is a modification only if the permit is affected by such change. Addition of automatic process control to formerly manually or mechanically operated system is a functionally equivalent component replacement. (53 FR 37930, September 28, 1988) |

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| 56 | **Burner Control Logic Enhancement** | Instrumentation and Controls | Addition of control loop relating liquid waste feed to equivalent natural gas feed rate. Will ensure that neither heat capacity nor combustion air capacity of burner is exceeded. (Previously performed manually.)<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Upgrade | No | Replacement of equipment with functionally equivalent components is a modification only if the permit is affected by such change. Addition of automatic process control to formerly manually or mechanically operated systems is a functionally equivalent component replacement. (53 FR 37930, September 28, 1988) |
| 21 | **Combustion Chamber O2 Monitor** | Instrumentation and Controls | Replacement of O2 monitors in the primary and secondary combustion chambers. The RCRA operating permit requires monitoring of upper (secondary) chamber oxygen monitoring.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Maintenance | No | Maintenance items are not modifications (53 FR 37924, September 28, 1988). |
| 66 | **Combustion Gas Monitor Removal** | Instrumentation and Controls | Removal of combustion gas monitor in the combustion gas glovebox, due to removal of the glovebox front.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Upgrade | No | This monitor was removed because the combustion blower glove box face has been remmoved. Therefore, combustion gases cannot accumulate and cause an explosion hazard. (The combustion gas monitor was an alarm type indicator.) There is no permit condition or monitoring requirement |

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| 68 | **Control System Upgrade** | Instrumentation and Controls | Replacement of mechanical process recorders and controllers with multipoint digital controllers.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Upgrade | No | Replacement of equipment with functionally equivalent components is a modification only if the permit is affected by such change. Replacement of mechanical-based control system with software-based control systems is a functionally equivalent component replacement. |
| 69 | **Control System Upgrade** | Instrumentation and Controls | Change in offgas pressure control valve control logic from feedback to feed forward-based control.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Upgrade | No | This change in the control logic changes the response time of the pressure control valve, making response quicker, and causes less flucuation in valve response. Valve function is not otherwise affected. (Functionally equivalent component change. 53 FR 37930, September 28, |
| 67 | **Control System Upgrade** | Instrumentation and Controls | Replacement of mechanical relay-based control logic with a Programmable Logic Controller (PLC). The PLC will control some of the critical system interlocks and provide data aquisition.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Upgrade | No | Replacement of equipment with functionally equivalent components is a modification only if the permit is affected by such change. Replacement of mechanical-based control systems with software-based control systems is a functionally equivalent equipment replacement. (53 FR 37930, September 28, 1988) |
| 48 | **Control Systems Upgrade** | Instrumentation and Controls | pH meters on the scrub solution recycle line are being moved to new locations to provide better data aquisition and parameter control.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Maintenance | No | Maintenance items are not modifications (53 FR 37924, September 28, 1988). |

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| 29 | **Control Valve Replacement** | Instrumentation and Controls | Replacement of control valves on the combustion air and natural gas supply lines with new control valves.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Maintenance | No | Maintenance items are not modifications (53 FR 37924, September 28, 1988). |
| 11 | **Cooling Loop Breakthrough Detection** | Instrumentation and Controls | A conductivity meter has been installed on the secondary cooling water loop to detect breakthrough or leaking from the process scrub system.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Maintenance | No | Maintenance items are not modifications (53 FR 37924, September 28, 1988). |
| 45 | **Electrical Rewiring** | Instrumentation and Controls | Entire electrical system rewired to separate high voltage and low voltage instrument wiring in order to eliminate induced signals.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Maintenance | No | Maintenance items are not modifications (53 FR 37924, September 28, 1988). |
| 55 | **Flow Meter Replacement** | Instrumentation and Controls | A new gyroscopic/coriolis mass flow meter installed on the liquid feed line to provide instantaneous readings of liquid waste flow to the high intensity vortex burner.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Maintenance | No | Maintenance items are not modifications (53 FR 37924, September 28, 1988). |

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| 87 | **Flowmeter Addition** | Instrumentation and Controls | A venturi flowmeter with mass calculator was added to the main ram glovebox to measure air in-leakage into the incinerator during box feed operations and during liquid feed operations.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Upgrade | No | Addition of this monitor is for additional data gathering capability outside of the permit monitoring requirements. This change has no effect on the permit or any permit monitoring conditions. |
| 10 | **Flowmeter Replacement** | Instrumentation and Controls | Flow meters on the scrub solution recycle system have all been replaced with gyroscopic/coriolis mass flowmeters.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Maintenance | No | Maintenance items are not modifications (53 FR 37924, September 28, 1988). |
| 23 | **HEPA Filter Pressure Drop Meassurement** | Instrumentation and Controls | Individual differential pressure gauges added to each HEPA filter to detect blinding and breakthrough. Formerly, pressure drop was measured across the filter plenum, not individual filters.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Maintenance | No | Maintenance items are not modifications (53 FR 37924, September 28, 1988). |

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| 22 | **Instrument Air Supply** | Instrumentation and Controls | Instrument air compressor replaced by Ingersoll Rand duplex compressor specifically designed for instrument air systems.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Maintenance | No | Maintenance items are not modifications (53 FR 37924, September 28, 1988). |
| 17 | **Neutron Monitors** | Instrumentation and Controls | Addition of neutron monitors in the CAI process area, external to the CAI process volume.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | None | No | The change described does not pertain to the authorized unit as described in Permit Module V. |
| 60 | **Offgas Alpha-Beta Monitor** | Instrumentation and Controls | Addition of offgas continuous alpha-beta monitor, for compliance with the RCRA permit monitoring requirement.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Upgrade | No | Monitor added to comply with permit monitoring condition. Equipment added is a requirement and does not affect the permit or the monitoring condition. |
| 72 | **Offgas CO/CO2/H2O Monitor** | Instrumentation and Controls | Addition of an offgas CO/CO2/H2O. This is to comply with the RCRA permit monitoring requirement for CO monitoring.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Upgrade | No | Monitor added to comply with permit monitoring condition. Equipment added is a requirement and does not affect the permit or the monitoring condition. |

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| 64 | **Offgas NO/NOx/SO2 Monitor** | Instrumentation and Controls | Addition of an offgas NO/NOx/SO2. There is no RCRA permit monitoring requirement.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Upgrade | No | Addition of this monitor is for additional data gathering capability outside of the permit monitoring requirements. This change has no effect on the permit or any permit monitoring conditions. |
| 63 | **Offgas Total Hydrocarbon Monitor** | Instrumentation and Controls | Addition of an offgas total hydrocarbon monitor to comply with the RCRA permit monitoring requirement.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Upgrade | No | Monitor added to comply with permit monitoring condition. Equipment added is a requirement and does not affect the permit or the monitoring condition. |
| 74 | **Carbon Adsorber Redesign** | Misc. APC Systems | Replacement of the carbon adsorber unit with a redesigned, dual-pass annular design unit constructed of Hastelloy C-22 and AL-6XN. Performance of the replacement unit has been modeled and determined to be functionally superior to the old unit.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Upgrade | No | Replacement of equipment with functionally equivalent components is a modification only if the permit is affected by such change. The new unit is functionally equivalent to the one it replaces and does not affect any aspect of the permit. |

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| 73 | **Flow Straightener Addition** | Misc. APC Systems | Addition of flow straighteners downstream of the HEPA bank and between the I.D. blowers and offgas flow meter.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Upgrade | No | Addition of flow straighteners is required by the monitoring instruments which have also been added in order to meet permit monitoring requirements. The addition does not affect the permit or any monitoring conditions. |
| 26 | **Material Change** | Misc. APC Systems | Replacement of sampling trombone with identical unit constructed of AL-6XN.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Maintenance | No | Maintenance items are not modifications (53 FR 37924, September 28, 1988). |
| 25 | **Material Change** | Misc. APC Systems | Change in offgas ducting not otherwise mentioned with ducts constructed of AL-6XN, in addition to minor rerouting.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Maintenance | No | Maintenance items are not modifications (53 FR 37924, September 28, 1988). |
| 77 | **NESHAPS Sampling Train Upgrade** | Misc. APC Systems | Possible changes to stack-gas sampling train to comply with NESHAPS sampling requirements.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | None | No | The NESHAPS stack-gas sampling train is not addressed by the RCRA operating permit, nor are the analytical results used to comply with any RCRA permit monitoring conditions. |

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| 71 | **Piping Change** | Misc. APC Systems | Possible addition of offgas superheater drain valve, in order to drain off accumulated condensation for the prevention of internal corrosion of the unit.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Maintenance | No | Maintenance items are not modifications (53 FR 37924, September 28, 1988). There is no change in function or capacity associated with this change. |
| 76 | **Sampling Duct Expansion** | Misc. APC Systems | Added expanded sampling duct section on the sampling trombone and stack.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Upgrade | No | This addition is required by the monitoring instruments which have also been added in order to meet permit monitoring requirements. The addition does not affect the permit or any monitoring conditions. |
| 31 | **Material Change** | Piping | Replacement of all process pumps. New pumps contain Hastelloy wetted parts. All units are sealess technology.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Maintenance | No | Maintenance items are not modifications (53 FR 37924, September 28, 1988). |
| 28 | **Material Change** | Piping | Existing instrument air supply lines replaced with Duraplus plastic pipe, straightened, and consolidated.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Maintenance | No | Maintenance items are not modifications (53 FR 37924, September 28, 1988). |

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| 19 | **Material Change** | Piping | Replacement of most pipes not otherwise mentioned with Hastelloy C-276<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Maintenance | No | Maintenance items are not modifications (53 FR 37924, September 28, 1988). |
| 70 | **Piping Change** | Piping | Liquid feed line (1/2" pipe with threaded fittings) replaced with 1/2" tubing with "Swagelok" fittings.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Maintenance | No | Maintenance items, including minor design changes, are not modifications (53 FR 37924, September 28, 1988). There is no change in function or capacity associated with this change. |
| 57 | **Piping Change** | Piping | Main Ram Glovebox air supply HEPA replaced by direct piping of combustion air to the underfire air blower.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Process Change | No | Minor design changes, like maintenance items, are not modifications (53 FR 37924, September 28, 1988). There is no change in function or capacity associated with this change. |

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| 58 | **Piping Change** | Piping | Movement of caustic addition line from process sump tank entry point to upstream of the scrubber liquid return pump. This change is to ensure proper mixing of the added caustic and better pH control. The plastic line will also be changed to st. steel.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Process change | No | Minor design changes, like maintenance items, are not modifications (53 FR 37924, September 28, 1988). There is no change in function or capacity associated with this change. |
| 61 | **Piping Change** | Piping | Added block valve on quench tower booster pump inlet.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Upgrade | No | Minor design changes, like maintenance items, are not modifications (53 FR 37924, September 28, 1988). There is no change in function or capacity associated with this change. |
| 62 | **Piping Change** | Piping | Added check valve on absorber column makeup water line to prevent backflow.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Upgrade | No | Minor design changes, like maintenance, are not permit modifications (53 FR 37924, September 28, 1988). There is no change in function or capacity associated with this change. |

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| 65 | **Piping Change** | Piping | Check valves added to combustion air lines, for prevention of combustion air and or combustion gas backflow out of the PCC and SCC.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Upgrade | No | Minor design changes, like maintenance items, are not permit modifications (53 FR 37924, September 28, 1988). There is no change in function or capacity associated with this change. |
| 27 | **Routine Maintenance** | Piping | Replaced original steam lance nozzles with identical parts. Addition of strainers to steam line and slight rerouting.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Maintenance | No | Maintenance items are not modifications (53 FR 37924, September 28, 1988). |
| 75 | **Blower Replacement** | Prime Mover | 1900 ICFM induced draft blowers replaced with 2200 ICFM I.D. blowers equipped with blower drains. The replaced blowers had corroded significantly and lacked drains.<br>References: Revised Part B Application | Maintenance | No | Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit. |

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| 78 | **IDB Drive Upgrade** | Prime Mover | Addition of variable frequency drives to the induced draft blowers to allow for precise control of draft.<br><br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Upgrade | No | Minor design changes, like maintenance items, are not modifications (53 FR 37924, September 28, 1988). There is no change in function or capacity associated with this change. |
| 80 | **Process Liquid Filtration Upgrade** | Process Liquid Handling | Replacement of tube filters ("dual filters") with a hydrocyclone and polypropylene bag filter system.<br><br>References: Revised Part B Application | Upgrade | No | Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit. |
| 79 | **Process Liquid Filtration Upgrade** | Process Liquid Handling | Addition of 1/16" perforated screen strainers to hydrocyclone overflow line for the protection of scrub solution recycle pumps downstream of the hydrocyclone.<br><br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Maintenance | No | Maintenance items, including minor design changes, are not modifications (53 FR 37924, September 28, 1988). The addition is to protect fluid handling equipment downstream. There is no change in function or capacity associated with this change. |
| 36 | **Material Change** | Quench Tower | Material changed from FRP to Hastelloy<br><br>References: Part B Application; Kaiser Report | Upgrade | No | Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit. |

| ID | TITLE | SYSTEM AFFECTED | DESCRIPTION | CATEGORY | Permit modification required??? | JUSTIFICATION |
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| 5 | **Quench Liquid Flow Increase** | Quench Tower | Liquid flow rate increased from 24 gpm to 28 gpm.<br><br>References: Revised Part B Application; Kaiser Report | Process Change | No | Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit. |
| 4 | **Quench Tower Nozzle Replacement** | Quench Tower | Lower nozzles replaced with Hastelloy C-22 alloy nozzles and are reoriented.<br><br>References: Kaiser Report | Upgrade | No | Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit. |
| 37 | **Quench Tower Spray Nozzles** | Quench Tower | Overflow weir replaced with spray nozzles<br><br>References: Kaiser Report | Upgrade | No | Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit. |

| ID | TITLE | SYSTEM AFFECTED | DESCRIPTION | CATEGORY | Permit modification required??? | JUSTIFICATION |
|---|---|---|---|---|---|---|
| 82 | **Routine Maintenance** | Quench Tower | All gaskets replaced with Viton gaskets; all plug valve liners replaced with Teflon liners.<br><br>References: Kaiser Report | Maintenance | No | Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit. |
| 32 | **Superheater Relocation** | Superheater | Relocation of stack gas superheater closer to absorber column.<br><br>References: Kaiser Report | Process change | No | Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit. |
| 12 | **Caustic Supply Tank** | Support Systems | Caustic tank replaced with new tank equipped with pre-mixed caustic supply hookups.<br><br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Maintenance | No | Maintenance items are not modifications (53 FR 37924, September 28, 1988). |
| 9 | **Cooling Tower Replacement** | Support Systems | Old cooling towers replaced with new identical units.<br><br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Maintenance | No | Maintenance items are not modifications (53 FR 37924, September 28, 1988). |

| ID | TITLE | SYSTEM AFFECTED | DESCRIPTION | CATEGORY | Permit modification required??? | JUSTIFICATION |
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| 24 | **Natural Gas Supply Upgrade** | Support Systems | The natural gas supply line has been upgraded to 1.5 inches. A new meter was installed. (An earthquake shutoff valve may be added.)<br><br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Maintenance | No | Maintenance items are not modifications (53 FR 37924, September 28, 1988). |
| 88 | **Replacement of Air Dryers for Instrument Air** | Support Systems | Molecular sieve dryers added to replace less reliable refrigeration-type dryers on instrument air supply compressor. This change is part of the compressor replacement.<br><br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Maintenance | No | Maintenance items are not modifications (53 FR 37924, September 28, 1988). |
| 40 | **Material Change** | Venturi Scrubber | Material changed from FRP to Hastelloy.<br><br>References: Revised Part B Application; Kaiser Report | Upgrade | No | Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit. |

| ID | TITLE | SYSTEM AFFECTED | DESCRIPTION | CATEGORY | Permit modification required??? | JUSTIFICATION |
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| 83 | **Routine Maintenance** | Venturi Scrubber | Flow restriction orifice liner changed from Hypalon to Viton.<br><br>References: Revised Part B Application; Kaiser Report | Maintenance | No | Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit. |
| 50 | **Scrub Solution Flow Increase** | Venturi Scrubber | Increase in liquid flow rate from 5 gpm to 10 gpm.<br><br>References: Kaiser Report | Process change | No | Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit. |
| 81 | **Venturi Pressure Drop Increase** | Venturi Scrubber | Increase offgas pressure drop through the venturi from 40 inH2O to 60 inH2O by restricting the variable venturi throat opening.<br><br>References: Kaiser Report | Process change | No | Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit. |

| ID | TITLE | SYSTEM AFFECTED | DESCRIPTION | CATEGORY | Permit modification required??? | JUSTIFICATION |
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| 13 | **Venturi Realignment** | Venturi Scrubber | Movement of venturi exit cone from axial to tangential alignment with the absorber column.<br>References: Kaiser Report | Upgrade | No | Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit. |
| 41 | **Venturi Scrub Liquid Flow Increase** | Venturi Scrubber | Venturi liquid injection orifice increased in sized from 1/4" to 3/8".<br>References: Revised Part B Application; Kaiser Report | Upgrade | No | Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit. |
| 84 | **Fire Suppression System Change** | Waste Feed | Replacement of water-based feed glovebox fire suppression system with a foam-based system.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Upgrade | No | Minor design changes, like maintenance items, are not modifications (53 FR 37924, September 28, 1988). In addition, this system is not addressed by the permit. |
| 3 | **Fire Suppression System Change** | Waste Feed | Main ram feeder glovebox carbon dioxide fire suppression system added.<br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Upgrade | No | Minor design changes, like maintenance items, are not modifications (53 FR 37924, September 28, 1988). In addition, this system is not addressed by the permit. |

| ID | TITLE | SYSTEM AFFECTED | DESCRIPTION | CATEGORY | Permit modification required??? | JUSTIFICATION |
|---|---|---|---|---|---|---|
| 1 | **HEPA Filter Addition** | Waste Feed | Main ram feeder glovebox HEPA filter added.<br><br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Upgrade | No | Minor design changes, like maintenance items, are not modifications (53 FR 37924, September 28, 1988). In addition, this system is not addressed by the permit. |
| 20 | **MEGAS Replacement** | Waste Feed | Multiple Energy Gamma Assay System (MEGAS) for SNM assay replaced with Multiple Axis Dual Analysis Measurement (MADAM) system. Also, the MADAM and waste package X-ray systems have been moved from the waste feed glovebox.<br><br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Maintenance | No | Minor design changes, like maintenance items, are not modifications (53 FR 37924, September 28, 1988). In addition, this system is not addressed by the permit. |
| 85 | **Ram Feeder Redesign** | Waste Feed | Ram feeder chain-drive mechanism replaced with hydraulic system.<br><br>References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95) | Upgrade | No | Minor design changes, like maintnenance items, are not modifications (53 FR 37924, September 28, 1988). In addition, this system is not addressed by the permit. |

| ID | TITLE | SYSTEM AFFECTED | DESCRIPTION | CATEGORY | Permit modification required??? | JUSTIFICATION |
|---|---|---|---|---|---|---|
| 35 | **Routine Maintenance** | Waste Feed | Replacement of the old feed glovebox with a stainless steel glovebox. | Maintenance | No | Maintenance items are not modifications (52 FR 37924, September 28, 1988). |

References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)

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