IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF OHIO
WESTERN DIVISION

STATE OF OHIO, Plaintiff, v. WESTINGHOUSE MATERIALS CO. OF OHIO, INC., et al., Defendants.	Civil Action No. C-1-87-0285 Judge Spiegel

CONSENT DECREE

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CONSENT DECREE

WHEREAS, on March 18, 1987, the State of Ohio filed a complaint in the above-captioned case against several defendants including Westinghouse Materials Co. of Ohio, Inc. ("WMCO"), and the United States Department of Energy ("DOE");

WHEREAS, Ohio alleges that WMCO and DOE have violated various provisions of Ohio law and regulations, and WMCO and DOE deny any violation of and any liability under any state statute, regulation or common law;

WHEREAS, DOE on July 18, 1986 entered into an Agreement with the United States Environmental Protection Agency ("US EPA") (hereinafter the agreement as amended shall be referred to as the "7/18/86 Agreement") pursuant to Executive Order 12088, 43 F.R. 47707 (October 13, 1978), and is currently carrying out a Remedial Investigation and Feasibility Study (hereinafter "RI/FS") pursuant to the 7/18/86 Agreement and the Comprehensive Environmental

Response, Compensation and Liability Act, as amended, 42 U.S.C. §§ 9601-9657 (hereinafter "CERCLA");

WHEREAS, the parties wish to resolve this action without litigation, and have, therefore, agreed to the entry of this Consent Decree without the admission or adjudication of any issue of fact or law.

NOW, THEREFORE, it is hereby ordered, adjudged and decreed as follows:

I. JURISDICTION AND VENUE

The Court has jurisdiction over the matters resolved in this Consent Decree and the parties to the decree. Venue is proper in this Court.

II. GENERAL PROVISIONS

For purposes of this Consent Decree, the following words and abbreviations have the meanings provided below:

2.1 "DOE" means the United States Department of Energy and its officers, agents, employees, and contractors;

2.2 "Ohio EPA" means Ohio Environmental Protection Agency and its representatives, and delegate agencies, including any contractor(s) retained by Ohio EPA to perform any monitoring, observation, testing, or other activities related to this Consent Decree;

2.3 Each of the terms "State", "State of Ohio", and "Ohio", includes all agencies and officers of the State of Ohio;

2.4 "FMPC" means the Feed Materials Production Center owned by DOE and located near Fernald, Ohio;

2.5 "OAC" means Ohio Administrative Code;

2.6 "WMCO" means Westinghouse Materials Co. of Ohio, Inc.

III. COMPLIANCE WITH OHIO AIR POLLUTION LAWS

[A]. UF_6 TO UF_4 REDUCTION FACILITY

3.1 DOE has submitted to Ohio a proposed revision of the Ohio EPA permit to install ("PTI") issued August 8, 1984, for the UF_6 to UF_4 Reduction Facility. A copy of the proposed revision is attached as Appendix A and is fully incorporated within this Consent Decree by reference. In addition, DOE has submitted to Ohio EPA an application for a permit to operate ("PTO") for the UF_6 to UF_4 Reduction Facility. DOE and WMCO shall operate the UF_6 to UF_4 Reduction Facility in accordance with any permits as they are finally and lawfully issued by Ohio EPA in response to these applications. Nothing in this Consent Decree shall be construed to preclude DOE and WMCO from exercising any right they have to appeal any action taken by Ohio EPA or US EPA concerning the application for a PTO or the proposed revision to the PTI.

3.2 DOE and WMCO shall guard against malfunctions and accidental or unpermitted releases of air contaminants from the UF_6 to UF_4 reduction process in the pilot plant at the FMPC, and maintain in good operating condition the safety and alarm systems which protect against such malfunctions and accidental or unpermitted releases. DOE and WMCO shall inspect the reactor vessel(s) in the UF_6 to UF_4 reduction process on a regular basis in order to detect any conditions that could result in a crack or

rupture of the vessel(s), and shall shut down or replace the vessel(s) as soon as is required to prevent such a crack or a rupture. DOE and WMCO shall control the operation of the UF_6 to UF_4 reduction process in a manner such that operation and maintenance procedures, alarm systems, and other safeguards for the operation of the reduction process, including an automatic shutdown of the facility if the operating temperature exceeds safety levels, are current and in use. In order to comply with this paragraph, DOE and WMCO shall, at a minimum, comply with the requirements and procedures described in Appendix B to this Consent Decree.

3.3 DOE and WMCO shall not modify any of the requirements or procedures set forth in Appendix B without first providing the language of the proposed modification(s) to Ohio EPA or its delegate agency at least thirty (30) days prior to the effective date of such proposed change(s). DOE and WMCO shall not make any modifications to Appendix B to which Ohio EPA objects in writing within thirty (30) days after receiving the notice. In the event of an emergency that requires temporary deviation from Appendix B in order to protect human health and safety or the environment, DOE and WMCO shall give Ohio EPA or its delegate agency verbal notice as soon as possible. The requirements of the PTO, when issued, will supersede the requirements set forth in paragraphs 3.2 and 3.3.

[B]. K-65 SILOS

3.4 DOE and WMCO shall not make any physical change in, or change in the method of operation of, either of the K-65 silos

at FMPC that will increase the amount of any air pollutant emitted or will result in the emission of any air pollutant not previously emitted without first obtaining authorization from Ohio EPA. In addition to obtaining the authorizations required by this paragraph, DOE and WMCO shall also notify the Ohio EPA delegate agency of their proposed actions for informational purposes.

3.5 DOE and WMCO shall comply with the terms and conditions of Ohio EPA permits to operate issued for the K-65 silos. Without predetermining the applicability or inapplicability of 42 U.S.C. § 9621(e)(1) to the terms and conditions of these permits, nothing in this Consent Decree shall be construed to preclude, restrict or expand the application of 42 U.S.C. § 9621(e)(1) to the FMPC.

[C]. MISCELLANEOUS

3.6 DOE and WMCO shall comply with the requirements of OAC 3745-15-06(B)(1) to immediately notify the Ohio EPA or its delegate agency in the event that any emission source, air pollution control equipment, or related facility breaks down in such a manner as to cause the emission of air contaminants in violation of any applicable law. In the event that giving immediate notification would increase the potential threat to human health and safety or the environment (such as where the only persons aware of the occurrence of the breakdown are unable to immediately notify Ohio EPA or its delegate agency because of the need to respond to the breakdown), notification shall be given as soon as it can be given without increasing the potential threat to

human health and safety or the environment. Any conflicting requirements set forth in any applicable PTO will, when issued, supersede this provision.

3.7 DOE and WMCO shall comply with the requirements of OAC 3745-15-06(A).

IV. PAYMENTS

4.1 Not later than thirty (30) days after the entry of this Consent Decree, WMCO shall pay to the State of Ohio in full and final settlement of disputed claims brought by the State of Ohio against WMCO in this action the sum of Sixty Thousand Dollars ($60,000) by certified check or by wire transfer payable to the order of "Treasurer, State of Ohio".

4.2 Not later than thirty (30) days after the entry of this Consent Decree, DOE shall pay to the State of Ohio in full and final settlement of disputed claims brought by the State of Ohio against DOE in this action the sum of Sixty-One Thousand Two Hundred Dollars ($61,200.00) by certified check or by wire transfer payable to the order of "Treasurer, State of Ohio", and the sum of Six Thousand Eight Hundred and Seventy-Nine Dollars ($6,879.00) for litigation costs by certified check or wire transfer to the order of "Ohio Attorney General".

V. RELEASES

The State hereby releases, covenants not to sue and not to bring any action whether civil, criminal or for administrative Findings and Orders, against WMCO, the United States or any department or agency thereof, or any past or present official,

employee, or contractor thereof (and any past or present official, officer, director, employee or sub-contractor of such contractor), or against any person named in the complaint or the amended complaint and subsequently dismissed by order of the Court, with respect to the claims contained in the Complaint and amended Complaint filed in this action.

VI. PERMITS AND APPROVALS

The State of Ohio will use its best efforts to review in a timely manner, following DOE application, any permits necessary for DOE to carry out the work required pursuant to this Consent Decree.

VII. USE OF DECREE

This Consent Decree was negotiated and executed by the parties in good faith to avoid expensive and protracted litigation and is a settlement of claims which were vigorously contested, denied and disputed as to validity and amount. The execution of this Consent Decree is not an admission of liability by DOE or WMCO with regard to any issue dealt with in this Consent Decree. Accordingly, it is the intention of the parties, and the parties hereby agree, that with the exception of this proceeding, any proceeding to adjudicate a permit application (but only to the extent necessary to prove the requirements of the Consent Decree), and any proceeding brought by the parties to enforce this Consent Decree, this Consent Decree shall not be admissible in any judicial or administrative proceeding whether civil or criminal, or in state

or federal court, and regardless of whether the gravamen of such action or proceeding is based in tort, contract or statute.

VIII. RESOLUTION OF DISPUTES

8.1 Should the parties have a good faith dispute over the interpretation of this Consent Decree or whether a term of this Consent Decree has been violated, or if the actions or requirements imposed on DOE and WMCO by Ohio pursuant to this Consent Decree conflict with actions or requirements imposed on DOE by U.S. EPA pursuant to the 7/18/86 Agreement, the procedures of this section shall apply except as specifically set forth elsewhere in this Consent Decree. Because the parties disagree over whether actions or requirements imposed on DOE and WMCO by Ohio pursuant to this Consent Decree take precedence over actions or requirements imposed on DOE by U.S. EPA pursuant to the 7/18/86 Agreement in the event of a conflict between the two, this Consent Decree shall not be construed to establish the authority of one over the other. The parties each reserve their rights to assert and defend their respective legal positions on this issue should such a conflict not be resolved by the parties pursuant to this section of the Consent Decree.

8.2 If any of the parties believes that a dispute is not a good faith dispute, or that a delay would pose or increase a threat of harm to the public or the environment, they may petition the Court for relief without following the dispute resolution procedures of this section.

8.3 During the pendency of any dispute, the parties agree that they shall continue to implement those portions of this Consent Decree which are not in dispute and which Ohio determines can be reasonably implemented pending final resolution of the issue(s) in dispute. If Ohio determines that all or part of those portions of work which are affected by the dispute should stop during the pendency of the dispute, DOE and WMCO shall discontinue implementing those portions of the work. All Parties to this Consent Decree agree they shall make reasonable efforts to informally resolve all disputes.

8.4 DOE and WMCO shall, within fifteen (15) days of any receipt of notification of any action by Ohio which they are disputing, provide Ohio with a written notice of dispute. DOE and WMCO shall, within thirty (30) days of receipt of notification of any such action by Ohio which is in dispute, provide Ohio with a written statement of dispute setting forth the nature of the dispute, their position with respect to the dispute and the information they are relying upon to support their position. If DOE and WMCO do not provide such written notice within the fifteen (15) day period, or after such notice fail to provide a written statement to Ohio within the thirty (30) day period, they shall be deemed to have agreed to the position taken by Ohio.

8.5 Upon receipt of the written statement of dispute, the parties shall engage in dispute resolution among the project coordinators. The project coordinators shall have fourteen (14) days from the receipt by Ohio of the written statement of dispute

to resolve the dispute. During this period the project coordinators shall meet or confer by telephone as many times as necessary to discuss and attempt resolution of the dispute. If a resolution cannot be reached on any issue within this fourteen (14) day period, any Party may, by written notice, elevate the dispute to the Dispute Resolution Committee (DRC) for resolution.

8.6 Each party shall designate one individual to serve on the DRC. The individuals designated to serve on the DRC shall be those designated in Subparagraph 8.7, or their delegate authorized to serve on the DRC on behalf of such designated individual, for the purposes of dispute resolution under this Consent Decree. The DRC will serve as a forum for resolution of disputes for which agreement has not been reached pursuant to paragraph 8.5. If all designated members of the DRC do not unanimously agree on a resolution of the dispute within thirty (30) days, any party may institute an action in this Court to resolve the dispute under this Consent Decree.

8.7 The Ohio designated member of the DRC is the Chief, Air Pollution Division of Ohio EPA. The DOE designated member is the DOE Site Manager. The WMCO designated member is _____. Notice of any delegation of authority from a Party's designated member on the DRC shall be provided to all other Parties.

8.8 The pendency of any dispute under this Part shall not affect DOE's and WMCO's responsibility for timely performance of the work required by this Consent Decree, except that the time period for completion of work affected by such dispute shall be

extended for a period of time not to exceed the actual time taken to resolve any good faith dispute in accordance with the procedures specified herein if the parties agree that the performance of such work could not reasonably continue during the pendency of such dispute. All elements of the work required by this Consent Decree which are not affected by the dispute shall continue and be completed in accordance with the work plan schedule.

8.9 Upon resolution of any dispute, DOE and WMCO shall implement this Consent Decree in accordance with the provisions of, and any timetable contained in, such resolution.

8.10 Resolution of a dispute pursuant to this section of the Consent Decree constitutes a final resolution of any dispute arising under this Consent Decree.

8.11 In the case of a dispute which is referred to the DRC and which involves any potential conflict under the RI/FS or the 7/18/86 Agreement (including but not limited to cleanup standards, investigation methods, timetables and remedial actions), an appropriate representative from U.S. EPA shall be invited to participate in the deliberations of the DRC. If the DRC is unable to resolve the dispute, the parties retain the right to seek resolution of the issue by the Court.

8.12 In any dispute subject to dispute resolution, the parties may by written agreement modify the procedures of subparagraphs 8.1 through 8.11 above, including but not limited to an extension or shortening of the times therein or the waiver of any provision set forth therein.

APPENDIX A

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The permit holder shall conduct, or have conducted, performance testing of the subject air contaminant source(s) in accordance with procedures approved by the Agency and shall submit a written report, signed by the source owner, or his authorized agent, describing the test procedures followed and the results of such tests. The director or his representatives shall be allowed to witness the tests, examine testing equipment and acquire, or cause acquisition and/or submission of, data and information necessary to provide adequate assurance that source operation, process operating parameters and other conditions, together with testing procedures, provide a valid representation and proper characterization of the source's emissions and/or control equipment performance.

Such testing shall be planned, scheduled and implemented so as to provide for:

(1) Prior written notification to the Ohio Environmental Protection Agency, through the appropriate District office or Local Air Pollution Control Agency where the original applicaton was filed. Such notification shall be made thirty (30) days in advance and shall specify the source operating parameters, the proposed test procedures and the time, date, place and person(s) conducting such tests.

(2) Submittal of the test results report within thirty (30) days after the test completion.

The facility will incorporate the following monitoring devices:

a. The UF_6 autoclaves will be equipped with conductivity monitors to detect the presence of a slow UF_6 leak from the cylinder connections. Fast acting pressure monitors will detect a large UF_6 leak. Both the conductivity monitors and the fast acting pressure monitors must be interfaced with the condensate valves to provide maximum response to a UF_6 leak. Alarms, ~~both local and in the control room~~; must be activated in any emergency condition.1

b. The dust collector exhausting the UF_4 packaging stations will be equipped with a differential pressure transmitter across the inlet and outlet of the dust collector. The PDT must provide an indication of the pressure drop across the dust collector for the purpose of ascertaining bag breakage or clogging. A ~~flow element and~~ transmitter will provide a positive indication of flow for monitoring and interlocking and to prevent operation of the packaging station unless the exhaust fan is operating.2

~~e.----A dust detector (Extranuclear Lab's Surface Ionization Gauge) must be provided in the exhaust duct to indicate and alarm, through the Distributive Control System (DCS), if the presence of UF_4 dust is detected.3~~

d c. The sintered metal filters for removal of particulate UF_4 from the reactor off gas stream will be equipped with differential pressure transmittors. Differential pressure across the filters will be monitored and alarmed through the DCS. A switch over to clean filters will be done automatically or manually and indication for filter change will be provided.4

~~e.----Two ultra-violet photometric analyzers for the detection of UF_6 (E. I. DuPont, Model 400) must monitor the off gas stream between the sintered metal filters and the chemical traps.5~~

~~f.----A third UF_6 detector will be located up stream of the condensers. If UF_6 is detected at this point, the system will be shut down and appropriate alarms initiated.6~~

~~g.----The H_2 burners on the scrubber exhaust stacks will be equipped with thermocouple flame detectors for safety purposes so that upon loss of pilot light or burner flame the flow can be directed through one burner and an alarm, via the DCS, can alert the operator.7~~

~~h.----Eight hydrogen monitors will be located under the roof at strategic points throughout the facility to detect the presence of hydrogen.8~~

This source and its associated air pollution control systems shall be maintained regularly in accordance with good engineering practices and the recommendations of the respective manufacturers in order to minimize air contaminant emissions.

Any malfunction of this source or its associated air pollution control systems shall be reported immediately to the Southwestern Ohio Air Pollution Control Agency in accordance with Ohio Administrative Code (OAC) Rule 3745-15-06.

Except as provided by OAC Rule 3745-15-06, any scheduled maintenance or malfunction necessitating the shutdown or bypassing of the air pollution control equipment shall be accompanied by the shutdown of this source.

CHANGES TO PTI 14-623 AND EXPLANATIONS

Listed below are the eight changes requested for ~~Permit~~ to Install (PTI) NO. 14-623. Items 1 through 8 correspond to the footnotes on the preceeding two pages.

1) It is requested that the requirement that alarms be both local and in the control room be deleted from Term and Condition a. Alarms are activated in any emergency condition. Alarms are either local or in the control room. These alarms are process alarms that inform the operator of an upset condition. The alarms detect UF_6 leaks that are contained within the gas tight autoclaves. There will be no air pollution emissions from the autoclaves. Therefore, changes in this Term and Condition do not affect emissions of air pollutants.

2) It is requested that the reference to a flow element be deleted from the last sentence in Term and Condition b. The differential pressure transmitter across the inlet and outlet of the dust collector provides the function of indicating the flow for monitoring and interlocking and prevents operation of the packaging station unless the exhaust fan is operating. The wording should be changed to clarify the device used.

3) It is requested that Term and Condition c be deleted. The Extranuclear Lab's Surface Ionization Gauge was found to unsuitable for this application. Term and Condition b will assure that the dust collector is functioning properly. Emissions of uranium are measured by monitoring the stack with a single point sampler.

4) It is requested that Term and Condition d of the PTI be changed to allow automatic or manual switchover to clean filters. Manual switchover adds flexibility. It also allows a person to evaluate an alarm from the differential pressure monitors to ensure that there is proper flow through the system.

5) It is requested that Term and Condition e of the PTI be deleted. The two analyzers which monitor UF_6 in the off gas stream between the sintered metal filters and the chemical traps are for process control. They are used to assure the correct stoichiometric ratio of UF_6 to hydrogen is present. Any UF_6 at this point is collected in the chemical traps, so that the presence of these monitors does not impact air emissions.

6) It is requested that Term and Condition f of the PTI be deleted. A third UF_6 monitor is not located up stream of the condensers. The chemical traps ensure that there is no UF_6 at the point where the third UF_6 monitor was required. If UF_6 did get to this point, it would solidify in the condenser causing system backpressure that would lead to appropriate action. The presence of this monitor does not impact air emissions.

7) It is requested that Term and Condition g of the PTI be deleted. The hydrogen burners on the scrubber exhaust stacks do not exist. It has been found that excessive heat would be generated by the hydrogen burners within the building. This would cause elevated temperatures. The elevated temperatures interfere with the operation of equipment.

8) It is requested that Term and Condition h of the PTI be deleted. The hydrogen monitors are not control equipment. They are safety equipment. A sufficient number of working hydrogen monitors are maintained and operated in order to ensure safe operation.

APPENDIX B

OPERATIONAL SAFETY REQUIREMENTS, SECTION 2, SAFETY SYSTEMS, SAFETY SETTINGS AND LIMITING SAFETY SETTINGS, FOR THE UF6 REDUCTION FACILITY FEED MATERIALS PRODUCTION CENTER

The following set forth limiting safety systems settings for the various safety systems incorporated into the UF6 Reduction Facility. These safety systems settings are designed to assure that safe operating limits of the facility will not be exceeded when upset conditions are introduced. These settings are established with sufficient margin from the normal operating zone to prevent inadvertent safety system action but not exceed the safe limits.

2. SAFETY SYSTEMS, SAFETY SETTINGS, AND LIMITING SAFETY SETTINGS

2.1 Reactor Safety Systems

2.1.1 Reactant and Reaction Product Confinement Systems

2.1.1.1 UF_6, HF, H_2, and particulate UF_4 are prevented from leaking into the work area by a column of product, referred to as a "seal leg". Should the product level drop below six inches as detected by either of a redundant pair of level probes, the DCS will shut down the reactor.

2.1.1.2 To prevent over-pressuring the reactor and minimize opportunity for leakage through gaskets, packing, or the "seal leg" the DCS will shut down the reactor should the internal pressure exceed 10 psig as indicated by either of a redundant pair of pressure transmitters.

R 2.1.1.3 A HF/UF_6 detector and sampling system is used to draw a sample and monitor the reactor cooling air exhaust. Should a reactor develop a crack and the reaction products leak into the cooling air exhaust and the level of HF exceed 5 ppm, a signal will be sent to the DCS to alert the operator. If a false alarm is not apparent, the operator will then actuate the "Emergency Production Shutdown" system. This will stop the flow of reactants into the reactor without initiating a nitrogen purge of the reactor.

R 2.1.1.4 To reduce the frequency of cracks in the reaction vessel and minimizing potential for subsequent UF_6 and HF leaks, the reactor heater set points will be maintained at 1300°F or less and the reactor will be shutdown by the DCS should the control thermocouples indicate 1400°F.

R 2.1.2 Radiation Detection Alarm Safety System

2.1.2.1 To minimize personnel exposure in the event of a criticality, a radiation detection alarm system (RDA) will detect radiation in excess of 80 mR/hr, sound an evacuation alarm locally and alert the Communications Center.

2.1.3 Criticality Control Systems

2.1.3.1 To prevent a possible nuclear criticality, it is necessary to limit the amount of material that is allowed to accumulate in the dust collector hopper to the limits shown in Table 1.

Should the level of product in the hopper exceed this value, as indicated by either of a pair of level probes the DCS will shut-down the dust collector.

2.1.4 Explosion Prevention Systems

R 2.1.4.1 A hydrogen detection system located on the facility ceiling and in the cooling air exhaust stack is electrically interlocked with key process valves. Upon detection of hydrogen in excess of 1%, a powered ventilation system is started to clear the building of hydrogen. Upon detection of hydrogen in excess of 2%, the following sequence occurs automatically: The reactor system is shutdown, the reactor and dissociator heaters turned off, the offgas valves opened, the system purged with N_2, the evacuation alarm sounded, and the Communication Center Alerted.

2.1.5 Over-Pressure Protection Safety Systems

2.1.5.1 There are two AHF recovery and transfer systems, the original installed in 1983 and a larger capacity system installed in 1988. The "old" AHF accumulator and AHF transfer tanks are protected by rupture disks which, when actuated, allow the pressure to be relieved to the condensers. The "new" accumulator and transfer tanks are protected in a similar manner, but pressure is relieved through 150 psi series/parallel rupture disks to a vent stack.

2.1.5.1 The "old" AHF transfer and accumulator tanks are protected by 15 psig rupture disks, while the AHF transfer and accumulator tanks for the "new" system are protected by 150 psig rupture disks. The AHF transfer pipeline is protected from hydraulic rupture by a 250 psig rupture disk which relieves back to the AHF transfer tank when the "old" AHF system is in use.

2.1.5.2 Each confined area of the ammonia transfer pipeline is protected by a relief valve which vents to an atmospheric stack, and is set at 250 psig (max). Each of the three ammonia dissociator vaporizers are protected by a 250 psig relief valve while the down stream piping is protected by a series of relief valves set at 23 psig (max), each of which also vents to an atmospheric stack.

2.2 Autoclave Safety Systems

2.2.1 Autoclave Pressure Control System

2.2.1.1 The amount of water within an autoclave is limited to 62 lb. to limit the pressure that would result from HF generated should UF_6 leak within an autoclave. This will also limit the maximum amount of moderator possible, eliminating potential for criticality.

A redundant set of condensate level probes located in the autoclave sump will signal the DCS to shut off the steam supply should the condensate level rise due to a plugged line, inadvertent valve closure, or other problem.

2.2.1.2 In the event a UF_6 leak should occur, the pressure will rise inside the autoclave due to the reaction of UF_6 with moisture present within the autoclave. To prevent over-pressuring the autoclave, a rupture disk will actuate if the pressure exceeds 140 psig, and a relief valve will open at 150 psig relieving the pressure through a vent to the roof, then reseal maintaining containment.

A pressure switch will send a signal to the DCS for alarming and documenting that the rupture disk has "actuated". Note that the pressure cannot exceed 150 psig unless a redundant set of condensate level probes fail simultaneously with a cylinder leak.

2.2.1.3 Should the pressure in the autoclave rise to 15 psig due to a UF_6 leak, a redundant set of pressure transmitters will signal the DCS which will put the autoclave in containment, preventing further increase in water inventory and further cylinder heating.

2.2.2 UF_6 Cylinder Pressure Control System

2.2.2.1 Should the UF_6 pressure exceed 100 psia in the cylinder, the DCS will close the redundant set of steam supply valves to stop heating and prevent the potential for cylinder rupture.

2.2.2.2 To prevent a possible UF_6 cylinder hydraulic rupture, the DCS shuts off the steam supply should either of the redundant set of the cylinder wall temperature elements indicate the limiting safety system setting is exceeded.

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CYLINDER TYPE		SETTING
48X,A	10 ton Thick-walled cylinders	235°F
48Y	14 ton Thick-walled cylinders	235°F
48G, H, HX, or OM	14 ton Thin-walled certified volume cylinders	230°F
5A or 12B	Coldtrap cylinders	235°F

2.2.2.3 The autoclave temperature is controlled by a steam supply pressure regulator to be set according to the type cylinders being vaporized. Should this fail, as indicated by either of a redundant set of pressure transmitters the DCS will close the redundant steam supply valves to prevent further heating of the cylinder. The limiting safety system settings are as follows:

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CYLINDER TYPE		SETTING
48X, A	10 ton Thick-walled cylinders	8 PSIG
48Y	14 ton Thick-walled cylinders	8 PSIG
48G, H, HX, or OM	14 ton Thin-walled certified volume cylinders	6 PSIG
5A or 12B	Coldtrap cylinders	8 PSIG

2.2.2.4 The DCS will shut off the steam supply after an hour if the UF_6 pressure transmitter does not indicate at least 24 psia, which is most likely, due to a plugged line or stuck valve. This is done because protection offered by the normal high pressure cutoff (Section 2.2.2.1) will not function.

2.2.3 UF_6 Release Control System

2.2.3.1 In the event a UF_6 leak should occur, the pressure will rise inside the autoclave due to the reaction of UF_6 with moisture within the autoclave. Upon receiving a signal from either of a set of redundant pressure transmitters that the pressure exceeds 15 psig, the DCS will shut off the steam supply and isolate the autoclave to contain the UF_6 leak.

2.2.3.2 Two samples of steam are withdrawn and condensed from the autoclave and measured for conductivity. Any UF_6 leaking will react with steam to form HF which will be detected by the redundant set of conductivity cells. The DCS upon receiving the signal will close the redundant pair of steam supply valves and isolate the autoclave system, to contain the UF_6 leak.

2.2.3.3 In the event a UF_6 leak should occur within the autoclave and the pressure rise, a rupture disk will rupture at 140 psig and a relief valve will open at 150 psig relieving the autoclave pressure to a vent on the roof and then close containing the system when the pressure drops to 150 psig. A pressure switch in the rupture disk cavity will send a signal to the DCS for alarming and documentation.

R 2.2.3.4 Prior to opening the autoclave an operator rotates a handwheel which allows residual steam pressure to be vented from the autoclave as well as disengages a locking pin which allows the autoclave locking ring to be opened. Should a leak occur within an autoclave and be detected (see Section 2.2.3.1 and 2.2.3.2) the DCS will close a backup, normally open solenoid valve in line with the handwheel, thus preventing an operator from accidentally venting an autoclave during a leak.

2.2.3.5 Redundant low pressure switches monitor the autoclave pressure. If either is 0.5 psig or greater, the pressure switches will prevent the hydraulic system from opening the autoclave locking ring.

2.2.3.6 Should a UF_6 leak be detected (see Sections 2.2.3.1 and 2.2.3.1) nine "containment valves" will close to isolate, or "contain" the autoclave. Additionally, an air motor will be activated which will remotely close the cylinder valve. Should the plant air supply fail, an automatic switch over to the plant nitrogen supply is activated for operation of the remote closer.

TABLE 1
REACTOR SAFETY SYSTEMS

SAFETY SYSTEM	LIMITING SAFETY SYSTEM SETTING (LSSS)	SAFETY LIMIT (SL)	LIMITING CONDITION FOR OPERATION	SAFETY SYSTEM ACTION TAKEN
REACTANT & REACTION PRODUCT CONFINEMENT				
Seal Leg Level Probe	6 inches (min)	-----	Both Operable	Shuts down reactor when seal leg level is at or below LSSS.
Reactor Pressure Control	10 psig (max)	-----	Both Operable	Shuts down reactor when reactor internal pressure exceeds LSSS.
Cooling Air Exhaust HF/UF6 Detector	5 ppm (max)	-----	Both Operable To Start One To Run	Signals DCS that a leak has been detected.
Emergency Production Shutdown	N/A	N/A	Operable	Allows operator to quickly shutdown reactor.
Reactor temperature control	1400 F	-----	Operable	Shuts down reactor when reactor shell temperature exceeds LSSS.
RADIATION SAFETY SYSTEMS				
Radiation Detection Alarm	80 mR/hr (max)	-----	Both Operable	Sounds plant evacuation alarm and alerts communication center when LSSS is exceeded.
CRITICALITY CONTROL SYSTEMS				
Dust Collector Hopper Level 1.00 < % U-235 < 2.00	13 inches (max)	15 inches (max)	Both Operable	Switches over to backup dust collector if operational; otherwise, shuts down reactors.
< 1.00% U-235	Unlimited	Unlimited	Not Required	

TABLE 1 (Continued)
REACTOR SAFETY SYSTEMS

SAFETY SYSTEM	LIMITING SAFETY SYSTEM SETTING (LSSS)	SAFETY LIMIT (SL)	LIMITING CONDITION FOR OPERATION	SAFETY SYSTEM ACTION TAKEN
EXPLOSION PREVENTION SYSTEMS				
Process Area Ceiling H2 Monitors	1% (max)	4% (max)	Operable	Building ventilation system is actuated. Local alarm sounded.
	2% (max)	4% (max)	Operable	Shuts down reactors, and dissociators and purges system independent of DCS. Alarm to communication center and building evacuation alarm sounds.
OVERPRESSURE PROTECTION SAFETY SYSTEMS				
AHF Recovery System Installed In 1983:				
AHF Accumulator Tank Rupture Disk	15 psig (max)	15 psig (max)	Operable	Disk ruptures relieving pressure to condensers.
AHF Transfer Tank Rupture Disk	15 psig (max)	15 psig (max)	Operable	Disk ruptures relieving pressure to condensers.
AHF Transfer Pipeline Rupture Disk	250 psig (max)	325 psig (max)	Operable	Disk ruptures relieving pressure to transfer tank.
AHF Recovery System Installed In 1988:				
AHF Accumulator Tank Rupture Disk	150 psig (max)	150 psig (max)	Operable	Disk ruptures relieving pressure to atmosphere.
AHF Transfer Tank Rupture Disk	150 psig (max)	150 psig (max)	Operable	Disk ruptures relieving pressure to atmosphere.
NH3 Pipeline Relief Valves	250 psig (max)	325 psig (max)	Operable	Relief valves lift relieving pressure to atmosphere.
NH3 Vaporizor Relief Valves	250 psig (max)	325 psig (max)	Operable	Relief valves lift relieving pressure to atmosphere.
Dissociator Relief Valves	23 psig (max)	25 psig (max)	Operable	Relief valves lift relieving pressure to atmosphere.

TABLE 1 (Continued)
AUTOCLAVE SAFETY SYSTEMS

SAFETY SYSTEM	LIMITING SAFETY SYSTEM SETTING (LSSS)	SAFETY LIMIT (SL)	LIMITING CONDITION FOR OPERATION	SAFETY SYSTEM ACTION TAKEN
AUTOCLAVE PRESSURE CONTROL SYSTEM				
Condensate High Level Probes	40 lbs (max)	62 lbs. (max)	Both Operable	Prevents excess accumulation of water in autoclave by closing steam valves in the event of a plugged condensate drain.
Rupture Disk	140 psig (max)	150 psig (max)	Operable	Disk ruptures, applying pressure to the relief valve.
Relief Valve	150 psig (max)	150 psig (max)	Operable	Relief valve opens to allow UF6 and reaction products to escape to prevent overpressure of autoclave and recloses when pressure falls below 150 psig.
Rupture Disk Pressure Switch	4 psig (max)	150 psig (max)	Operable	Signals DCS that rupture disk has ruptured.
Autoclave Pressure Control	15 psig (max)	150 psig (max)	Both Operable	Places autoclave in containment when autoclave pressure exceeds LSSS.
UF6 CYLINDER PRESSURE CONTROL SYSTEM				
Cylinder Pressure Control	100 psia (max)	115 psia (max)	Operable	Closes steam supply valve when cylinder pressure exceeds LSSS.
Cylinder Temperature Control				
48A, 48X, 48Y Thick-wall, and 5A, 12B Cold Trap Cylinders	235 F (max)	250 F (max)	Both Operable	Closes steam supply valves when cylinder Temperature Exceeds LSSS.
48G, 0M, 48H, 48HX Thin-wall Certified Volume Cylinders	230 F (max)	235 F (max)		
Steam Pressure Control				
48A, 48X, 48Y Thick-wall, and 5A, 12B Cold Trap Cylinders	8 psig (max)	10 psig (max)	Both Operable	Closes steam supply valves when autoclave pressure Exceeds LSSS.
48G, 0M, 48H, 48HX Thin-wall Certified Volume Cylinders	6 psig (max)	8 psig (max)		
Cylinder Pressure Control	24 psia after one hour	----	Operable	Closes steam valves if does not exceed LSSS after one hour.

TABLE 1 (Continued)

AUTOCLAVE SAFETY SYSTEMS

SAFETY SYSTEM	LIMITING SAFETY SYSTEM SETTING (LSSS)	SAFETY LIMIT (SL)	LIMITING CONDITION FOR OPERATION	SAFETY SYSTEM ACTION TAKEN
UF6 Release Pressure Detectors	15 psig (max)	150 psig (max)	Both Operable	Places autoclave in containment when autoclave pressure exceeds LSSS.
Steam Conductivity Monitors	60 μMho	....	Both Operable To Start One to Run	Places autoclave in containment when autoclave condensate conductivity exceeds LSSS.
Rupture Disk	140 psig (max)	150 psig (max)	Operable	Disk ruptures applying pressure to relief valve.
Autoclave Relief	150 psig (max)	150 psig (max)	Operable	Relief valve opens to allow UF6 and reaction products to escape to prevent overpressure of autoclave and recloses when pressure falls below 150 psig to limit release.
Autoclave Opening Prevention Device	0.5 psig (max)	....	Both Operable	Prevents autoclave from being opened when pressure exceeds LSSS.