

JUL 07 1992 <i>Sta. 21 (20)</i> ENGINEERING DATA TRANSMITTAL	Page 1 of <u>1</u> 1. EDT 159704
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2. To: (Receiving Organization) Distribution	3. From: (Originating Organization) W81225B 200 Area Remediation	4. Related EDT No.: N/A
5. Proj./Prog./Dept./Div.: Environmental Restoration	6. Cog. Engr.: <i>PE 4 AJ</i> J. N. Fisler	7. Purchase Order No.: N/A
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11. Receiver Remarks:		10. System/Bldg./Facility: N/A
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15. DATA TRANSMITTED					(F)	(G)	(H)	(I)
(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Impact Level	Reason for Transmittal	Originator Disposition	Receiver Disposition
1	WHC-S-0119		0	Vapor Extraction System Control System Upgrade Specifications	4	1	1	

16. KEY			
Impact Level (F)	Reason for Transmittal (G)		Disposition (H) & (I)
1, 2, 3, or 4 (see MRP 5.43)	1. Approval 2. Release 3. Information	4. Review 5. Post-Review 6. Dist. (Receipt Acknow. Required)	1. Approved 2. Approved w/comment 3. Disapproved w/comment 4. Reviewed no/comment 5. Reviewed w/comment 6. Receipt acknowledged

(G)	(H)	17. SIGNATURE/DISTRIBUTION (See Impact Level for required signatures)								(G)	(H)
Reason	Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M) MSIN	Reason	Disp.
1	1/4	Cog. Eng. J. N. Fisler	<i>J.N. Fisler</i>	7-1-92	H4-55	J. W. Green			H4-55	3	4
1	1/4	Cog. Mgr. M. C. Hagood	<i>M.C. Hagood</i>		H4-55	W. L. Johnson	<i>W.L. Johnson</i>		H4-55	3	4
		QA				EDMC (2)			H4-22	3	
		Safety				IRA Clearance			H4-17	3	
		Env.				Central Files			L8-04	3	
3		R. T. Coffman			N3-05						
3		S. J. Gale			N3-05						

18. J. N. Fisler <i>J.N. Fisler</i> Signature of EDT Originator Date: 7-1-92	19. _____ Authorized Representative Date for Receiving Organization	20. <i>W.L. Johnson</i> W. L. Johnson Cognizant/Project Engineer's Manager Date: 7/1/92	21. DOE APPROVAL (if required) Ltr. No. <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/comments <input type="checkbox"/> Disapproved w/comments
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WHC-S-0119
Rev. 0
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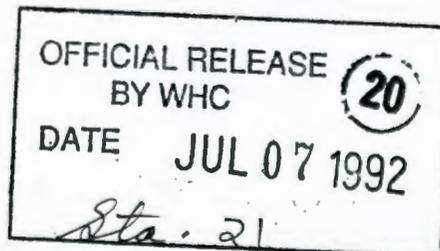
SPECIFICATION FOR

Vapor Extraction System, Control System Upgrade Specification

JF 7-7-92
Building: ~~450 Hills~~ MO-546 Carbon Tetrachloride Site

Project: Carbon Tetrachloride Expedited Response Action

Impact Level: 4



Prepared By:

J. N. Fisler

J. N. Fisler 7-7-92

Approved By:

W. L. Johnson

W. L. Johnson

Date

7/7/92

WHC-S-0119, Rev. 0

VAPOR EXTRACTION SYSTEM

CONTROL SYSTEM UPGRADE

SPECIFICATION

WESTINGHOUSE HANFORD COMPANY

JUNE 1992

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1.0 SCOPE

This specification defines the requirements for a process control system for an existing Vacuum Extraction System (VES). The VES removes carbon tetrachloride (CCl_4) vapors from the unsaturated soil beneath the 200 West Area in the vicinity of the Plutonium Finishing Plant. The VES draws CCl_4 vapors from existing perforated wells and loads the CCl_4 onto granular activated carbon for subsequent treatment, destruction or disposal. The treated gaseous effluent is then vented out the stack.

The process control system will consist of the following:

- Programmable logic control system
- Cathode ray tube (CRT) based operator interface.

The process control system shall be furnished complete with all equipment and controls necessary to meet the requirements of this specification.

2.0 DESCRIPTION

The process control system will accept signals from pressure, vacuum and flow transducers, alpha and beta cams, radon detectors, and carbon tetrachloride instruments on the existing VES.

The process control system will accept the above analog signals as well as discrete signals from instruments and relays. The process control system will monitor these signals, historically store data, and provide the operator with process information. When an analog signal reaches a certain set point or a discrete signal is initiated, an alarm will sound and then a historical alarm file and report will be generated. If the alarm is an interlocked signal the blower will shutdown through a discrete output, a report will be generated, and the VES will stop operating.

When the carbon tetrachloride is pumped from the ground, water is pulled out of the ground into the vapor extraction system. The process control system should provide analog proportional integral derivative (PID) outputs to control the temperature of hose heaters, which will increase the temperature of the air stream and remove some of the water from the air stream.

3.0 REQUIREMENTS

3.1 GENERAL

The process control system shall be capable of operating the VES under the following general conditions:

- 24 h/d, 7 d/wk operation (Note: this is to mean that the VES shall be capable of around-the-clock operation when scheduled, but no redundancy is required to achieve this)
- Up to 100 mph winds
- Precipitation maximum is a 5-yr, 24-h event of 2-in. rainfall
- Up to 365 solar/d/yr
- Ambient temperature range is -10°F to +110°F
- The process controller will be kept in a relatively clean 60-80° environment in the control trailer
- Elevation at the site is approximately 635 ft above sea level.

3.2 ELECTRICAL POWER REQUIREMENTS

Power will be provided from the existing control room trailer. Electrical service equipment and wiring shall include the following:

- All electrical equipment should be Underwriters Laboratories, Inc., listed and electrical work shall conform to the National Electric Code
- All wiring conductors shall be copper, no aluminum conductors.

3.3 SPECIFIC REQUIREMENTS

This section describes the specific requirements for the control system upgrade (or process control system) for the VES. The process control system shall be a programmable controller based system located in a trailer adjacent to the VES. The trailer will be provided by the buyer. The process control system will provide continuous monitoring of process inputs and control outputs as required to maintain process operations, ensure stability, and safe and efficient operation of the VES.

The process control system shall provide a CRT personal computer-based operator interface station that updates process inputs, graphics, historical storage, alarm annunciation, control outputs, security, and communications.

3.3.1 Operating Platform

The operating platform operator interface shall be an IBM compatible 386 or 486 DOS based system with a 14-in. VGA monitor.

3.3.2 Graphics

The graphics system should include the capability to update process inputs, show process flow schematics, show process trends, and indicate alarms.

3.3.3 Software

Any software provided as part of the process control system that is resident in volatile memory shall not be copy protected. The Buyer shall be permitted to make unlimited backup copies for protection against loss of primary copy.

3.3.4 Historical Storage

The historical storage capability should allow data to be stored on a user definable interval and the ability to retrieve a specific input or group of inputs for comparison. It should also allow the user to access the database using a spreadsheet.

3.3.5 Alarm Annunciation

The operator interface should have at least two alarm levels. One should be a warning that a specific input is approaching a possible shutdown level. The next alarm should shutdown the VES if the input is greater than its set point. Both of these conditions should provide indication on the operator monitor and be historically logged in the database file.

3.3.6 Control outputs

The process control system should provide for batch/sequence control, discrete control, and continuous PID control.

3.3.7 Security

The security function of the process control system should limit personnel access and control only where authority has been given.

3.3.8 Communications

An option should be available for a modem or other communication method to call a remote area (offices) on shutdown.

3.3.9 Maintenance

All components, modules, and equipment shall provide a minimum useful life of 10 yr with normal maintenance and operation.

3.3.10 Equipment

All electrical equipment provided as part of the process control system shall be Underwriters Laboratories, Inc., or Factory Mutual listed.

3.4 SIGNAL REQUIREMENTS FOR PROGRAMMABLE CONTROLLER

Analog inputs shall be universal (0 - 5 VDC, 4-20mA, 0-100mV, etc.) user selectable, analog outputs shall be 4-20ma, discrete inputs and outputs; 120 and 24 VAC.

The following are signals from transducers and instruments on the VES that will have to be processed by the control system.

Number of inputs	Type of input
30	4-20mA loops
2	0-10mV signals
1	1-6V signal
3	1-10V signals
4	Type T Thermocouples

PID control will be needed in the future on some of the 4-20mA loops. Also, room should be available in the control system to accommodate future signals.

The process control system should have the capability to compare two or more channels and output this information to another channel.

3.5 DOCUMENTATION

- Engineering drawings of internal logic block diagrams and wiring diagrams illustrating the process control system shall be provided
- A complete list of spare parts with all part numbers, quantities, material descriptions, and recommended spare parts shall be provided
- Seller shall provide five sets of installation instructions and technical manuals that describe the hardware and hardware maintenance and servicing, software program, configuration including; graphics, text and database editors; and operations manuals to help in the installation and use of the process control system.

3.6 ONSITE SERVICES

- A field engineer or knowledgeable equipment representative shall assist in the initial debugging and start-up of the process control system
- Orientation and training on the process control system shall be provided to the Buyer's operating and maintenance personnel.

4.0 EXCEPTIONS

In the event the Seller wishes to deviate from this Specification, the Seller must contact Buyer and obtain approval in writing prior to implementation. The exception(s) then becomes part of this Specification.