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SYSTEM DESIGN DESCRIPTION FOR THE SY101 VENT  
HEADER FLOW ELEMENT ENCLOSURE UPGRADE

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11/27/95

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# SUPPORTING DOCUMENT

1. Total Pages 7

2. Title

SYSTEM DESIGN DESCRIPTION FOR THE SY-101 VENT  
HEADER FLOW ELEMENT ENCLOSURE UPGRADE

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6. Author

Name: G. F. Vargo, Jr.

Signature

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7. Abstract

THIS DOCUMENT DESCRIBES THE DESIGN OF THE HIGH AND LOW RANGE VENT HEADER FLOW  
ELEMENT(S) FIELD ENCLOSURE FOR THE 241-SY-101 HIGH LEVEL NUCLEAR WASTE UNDERGROUND  
STORAGE TANK.

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**WHC-SD-WM-SDD-064**  
**Rev 0**

**SYSTEM DESIGN DESCRIPTION  
FOR THE  
SY-101 VENT HEADER FLOW ELEMENT  
ENCLOSURE UPGRADE**

**WESTINGHOUSE HANFORD COMPANY**  
**OCTOBER 1995**

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**ACRONYMS AND ABBREVIATIONS**

FTE	Flow Transmitter Element
GFCI	Ground Fault Circuit Interrupter
NEMA	National Electrical Manufacturers Association
SDD	System Design Description
T/C	Thermocouple
Vac	Volts Alternating Current

**SYSTEM DESIGN DESCRIPTION  
FOR THE SY-101 VENT HEADER FLOW ELEMENT  
ENCLOSURE UPGRADE**

**1.0 DESCRIPTION**

This document describes the design of the high and low range vent header flow element(s) field enclosure for the 241-SY-101 high level nuclear waste underground storage tank. The enclosure is environmentally protected and prevents adverse weather conditions from effecting the performance of the flow elements. Previously, during wintery conditions, the elements have become inoperable due to freezing conditions.

**2.0 HARDWARE**

The enclosure consists of a full size NEMA 12 72" upright cabinet with a clear Lexan<sup>1</sup> (polycarbonate resin) cut out window on the North door, 8000 BTU air conditioner(a/c), a roof mounted rain hood, half sun shield(s) on the South and East sides, and a 800 watt internal cabinet heater. The cabinet is fully insulated, internally, with 1" Armstrong Armaflex II<sup>2</sup> insulation. An Omega<sup>3</sup> DP25-TC Programmable Digital Thermocouple(T/C) meter reads the cabinet internal temperature and energizes an amber flashing roof mounted beacon if the cabinet temperature exceeds 90<sup>0</sup> F or drops below 50<sup>0</sup> F. The Omega digital thermocouple provides a N.O. relay contact closure(s) for this function. The a/c and heater are independently controlled by separate thermostats and have been adjusted to maintain the cabinet internal temperature approximately between 70<sup>0</sup> F and 80<sup>0</sup> F. The vent header low range flow detector VTP-FIT-3101A(FTE50001) and the high range detector VTP-FIT-3101B(FTE50002) are mounted to a shelf inside the cabinet. Additional features include a Stabiline<sup>4</sup> power conditioner and two(2) GFCI 120 Vac, 15 amp service receptacles, one(1) inside the cabinet and one(1) outside the cabinet. The externally mounted receptacle is rated for outdoor use and protected by a weatherproof cover.

The cabinet is located on the Southwest side of the 241-SY-101 vent header and is permanently mounted to the existing concrete pad.

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<sup>1</sup> Lexan is a trademark of GE Plastics.

<sup>2</sup> Armstrong Armaflex II is a trademark of Armstrong, Corp.

<sup>3</sup> Omega is a trademark of the Omega Corp.

<sup>4</sup> Stabiline is a trademark of the Stabiline Corp.

### 3.0 OPERATION

The cabinet is permanently connected into the SY farm electrical power and is energized, via circuit breaker, from inside the cabinet. Reference H-14-100407, "VTP-PNL-3108 INST. CABINET WIRING DIAGRAM", and H-14-100456, "VTP-PNL-3108 INST. CABINET ELEMENTARY DIAGRAM". Once the cabinet has been energized no other actions are required by the operator. The flow transducer elements, a/c, heater, and digital thermocouple will automatically energize, and begin to function, when the main breaker to the cabinet is closed.

An interior light is provided that is controlled from a switch, located just inside the cabinet interior, on the right hand side.

### 4.0 CALIBRATION

The following components have been initially set and should require no further adjustment during their lifetime:

1. The enclosure a/c (VTP-AC-3108) thermostat has been set and verified to energize at 80° F. The a/c deenergizes at approximately 75° F.
2. The enclosure heater (VTP-HTR-3108) thermostat has been set and verified to energize at 70° F, and deenergizes at approximately 72° F.

**NOTE:** The a/c and the heater are electrically interlocked to prevent energizing simultaneously.

3. The Omega DP25-TC Programmable Digital Thermocouple Meter has been programmed to alarm at 90° F, on the high end, and 50° F, on the low end, by energizing the roof mounted amber flashing beacon when these limits are exceeded. Reference the "OMEGA DP25-TC PROGRAMMABLE DIGITAL THERMOCOUPLE METER OPERATOR'S MANUAL" for programming instructions. The alarm will automatically clear when the cabinet temperature returns to its normal operating range. When this occurs the roof mounted light will return to the off state.

### 5.0 MAINTENANCE

No maintenance is required on the cabinet system. However, the flow elements, installed in the cabinet, will require periodic calibration and maintenance.

## 6.0 CERTIFIED VENDOR FILE

The Certified Vendor Information file (CVI) is 22129, Supplemental 64, Enclosure for Supplement 4. This is the CVI file for the 241-SY-101 Veltron vent header flow transmitters.

## 7.0 REFERENCES

1. WHC-SD-MM-WP-304, "Work Plan For the SY-101 Vent Header Enclosure Upgrade", Westinghouse Hanford Company, June 1995.
2. WHC-SD-MM-ATP-142, "Acceptance Test Procedure for the Fabrication of the SY-101 Vent Header Flow Element Enclosure", Westinghouse Hanford Company, August 1995.
3. WHC-SD-MM-ATR-142, "Acceptance Test Report for the Fabrication of the SY-101 Vent Header Flow Element Enclosure", Westinghouse Hanford Company, August 1995.
4. H-14-100405, "VTP-PNL-3108 INST. CABINET ASSEMBLY", Westinghouse Hanford Company drawing.
5. H-14-100406, "VTP-PNL-3108 INST. ENCLOSURE ASSEMBLY", Westinghouse Hanford Company drawing.
6. H-14-100407, "VTP-PNL-3108 INST. CABINET WIRING DIAGRAM", Westinghouse Hanford Company drawing.
7. H-14-100456, VTP-PNP-3108 INST. CABINET ELEMENTARY DIAGRAM", Westinghouse Hanford Company drawing.
8. "STANDARD ENGINEERING PRACTICES", WHC-CM-6-1, Westinghouse Hanford Company.
9. "NATIONAL ELECTRICAL CODE HANDBOOK 1993", National Fire Protection Association, Batterymarch Park, Quincy, MA.

## DISTRIBUTION SHEET

To DISTRIBUTION	From CHARACTERIZATION EQUIPMENT DEVELOPMENT	Page 1 of 1
		Date 10/13/95
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