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Accession #: D295188042

Document #: SD-WM-ETP-178

Title/Desc:

TASK PLAN SEL & EVALUATION OF FLOW MONITORING
INSTRUMENTATION USED THE PRIMARY EXHAUST
VENTILATION IN DOUBLE SHELL HYDROGEN WATCH LIST
TANKS [DST]

Pages: 11

2. To: (Receiving Organization) Distribution	3. From: (Originating Organization) NA Hertelendy Characterization Monitoring Equipment	4. Related EDT No.: NA
5. Proj./Prog./Dept./Div.: Characterization	6. Cog. Engr.: GD Feltner	7. Purchase Order No.: NA
8. Originator Remarks: For approval/release		9. Equip./Component No.: NA
		10. System/Bldg./Facility: 200Gen
11. Receiver Remarks:		12. Major Assm. Dwg. No.: NA
		13. Permit/Permit Application No.: NA
		14. Required Response Date: 11/30/95

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	Approval Designator	Reason for Transmittal	Originator Disposition	Receiver Disposition
1	WHC-SD-WM-ETP-178	A11	0	Task Plan for the Selection and Evaluation of flow Monitoring Instrumentation to be used on the primary Exhaust Ventilation in Double Shell Hydrogen Watch List tanks	g			

16 KEY					
Approval Designator (F)		Reason for Transmittal (G)		Disposition (H) & (I)	
E, S, O, D or N/A (see WHC-CM-3-5, Sec. 12.7)		1. Approval	4. Review	1. Approved	4. Reviewed no/comment
		2. Release	5. Post-Review	2. Approved w/comment	5. Reviewed w/comment
		3. Information	6. Dist. (Receipt Acknow. Required)	3. Disapproved w/comment	6. Receipt acknowledged

(G)	(H)	17	SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)	(I)	(J)
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TASK PLAN FOR THE SELECTION AND EVALUATION OF FLOW MONITORING INSTRUMENTATION TO BE USED ON THE PRIMARY EXHAUST VENTILATION IN DOUBLE SHELL HYDROGEN WATCH LIST TANKS

NA Hertelendy

WHC

PO Box 1970, Richland, WA 99352

U.S. Department of Energy Contract DE-AC06-87RL10930

EDT/ECN: 140831

UC: 802

Org Code: 75240

Charge Code: N2169

B&R Code:EW3120072

Total Pages: 8

Key Words: Engineering Task Plan, flow, ventilation, double shell tanks, watch list

Abstract: This Task Plan outlines the activities required to select and evaluate flow measuring devices to be used in the primary exhaust ventilation ducts for Double Shell Tanks (DST) on the hydrogen watch list that don't already have this capability. This currently includes tanks 101-AW, 103-AN, 104-AN, and 105-AN. The continuous measurement and recording of this flow is necessary to quantify the amount of hydrogen being off-gassed by these tanks for further mitigation studies.

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Karen L. Holand

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12/4/95

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**TASK PLAN FOR THE SELECTION AND EVALUATION OF
FLOW MONITORING INSTRUMENTATION TO BE USED ON
THE PRIMARY EXHAUST VENTILATION IN DOUBLE SHELL
HYDROGEN WATCH LIST TANKS**

Prepared by

N. A. Hertelendy
Westinghouse Hanford Company

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**TASK PLAN FOR THE SELECTION AND EVALUATION OF
FLOW MONITORING INSTRUMENTATION TO BE USED ON THE PRIMARY EXHAUST VENTILATION
IN DOUBLE SHELL HYDROGEN WATCH LIST TANKS**

1.0 INTRODUCTION

This Task Plan outlines the activities required to select and evaluate flow measuring devices to be used in the primary exhaust ventilation ducts for Double Shell Tanks (DST) on the hydrogen watch list that don't already have this capability. This currently includes tanks 101-AW, 103-AN, 104-AN, and 105-AN. The continuous measurement and recording of this flow is necessary to quantify the amount of hydrogen being off-gassed by these tanks for further mitigation studies. The flow in these tanks range from 0.25 mps, (50 fpm), to 1.48 mps, (350 fpm). These flow rates are too low to enable the use of pitot tube, and most readily useable range for hot wire anemometer type flow monitors. Past experiences with Sierra Instrument's and KURZ Instrument's hot wire anemometer based mass flow meters at Hanford were poor. Both manufacturer's instruments were found to be unreliable high maintenance items. These experiences are forcing the re-evaluation and selection of instruments to be used at these low flow and relatively high humidity conditions at Hanford in general, and in these tanks in particular.

2.0 SCOPE

2.1 OBJECTIVES

The main objective of this task is to select and evaluate flow meters that will have reasonable reliability and accuracy in measuring the primary ventilation flow out of the Double Shell hydrogen watch list tanks. Based on this evaluation recommend the instrument to be used in these tanks. The instrumentation should be reliable, accurate, and maintainable.

2.2 DELIVERABLES

The deliverables will be the final test report, detailing the results of the evaluation and recommending the instrument to be used in tanks 101-AW, 103-AN, 104-AN, and 105-AN, and explaining the reasoning for the selection.

3.0 DESCRIPTION

3.1 PHYSICAL DESCRIPTION

A calibrated, high differential pressure, flow element will be installed on the inlet side of the large accumulator to be used as the air flow

supply. The outlet of the accumulator will connect to lexan or acrylic mockup of a typical valve pit flow meter installation.

Each of the selected flow meters will be first tested for:

1. Accuracy. (Calibration)
2. Repeatability over a period of time.
3. Effects of high humidity over a minimum of 48 Hrs.
4. Sensitivity to position.
5. Ease of installation.
6. Ease of maintenance.

3.2 ENGINEERING TASKS

The engineering tasks, of selection for testing, evaluation, and final selection for use, as well as the preparation and issue of the final report is the responsibility of Characterization Monitoring Equipment Development, (75240).

3.3 PROCUREMENT TASKS

Procurement of necessary equipment will be led by Characterization Monitoring Development (75240).

3.4 TEST PREPARATION AND SETUP

Test preparation, setup and instrumentation will be prepared by 306E laboratory personnel, (8A200).

4.0 ORGANIZATION

The overall project lead for this project will be , Characterization Monitoring Equipment Development, (75240) Direction for other organizations will only come from this organization.

4.1 CHARACTERIZATION MONITORING DEVELOPMENT (75240)

Characterization Monitoring Development will function as the lead organization and will select sensors, design test setup, conduct test, evaluate test results, make final sensor selection, and write final test report.

Manager: R. E. Bauer
Engineer: N. A. Hertelendy

4.2 CHARACTERIZATION EQUIPMENT DEVELOPMENT (75250)

Characterization Equipment Development will assist in the procurement of sensors for evaluation.

4.3 EQUIPMENT DEVELOPMENT (8A200)

Equipment Development will be responsible for test setup & test equipment fabrication and procurement and cleanup after completion of the program.

Manager: J. R. Thielges
Engineer: T. A. Delucchi

◆ MAJOR MILESTONE ● SIGNIFICANT MILESTONE ◇ MILESTONE COMPLETED △ STATUS □ SLIPAGE ◇ RECOVERED

5.0 SCHEDULE

WMC-SD-WM-ETP-178
 REV 0

6.0 COST ESTIMATE

The cost estimate for this effort is:

Project Management	\$2,000
Prepare Engineering Task Plan	\$1,500
Conduct sensor search	\$4,000
Purchase sensors for evaluation	\$35,000
Prepare test setup	\$4,000
Conduct tests & evaluation	\$25,000
Prepare final test report	\$5500
TOTAL	<u>\$77,000</u>

No contingency has been added.

DISTRIBUTION SHEET

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