DISTRIBUTION SHEET

To DISTRUBTION	From M. L. De Vries	Page 1 of 1
		Date
Project Title/Work Order Heat Exchanger Bypass Test Report		EDT No. 609877
		ECN No.

Name	MSIN	Text With All Attach.	Text Only	Attach./ Appendix Only	EDT/ECN Only
G. B. Chronister	T5-50	X			
L. T. Cunningham	T5-50	X			
M. L. De Vries	T5-55	X			
G. A. Funston	T5-55	X			
M. W. Gibson	T5-55	X			
W. S. Lewis	T5-55	X			
Central Files	L8-04	X			
O.S.T.I. (2)	L8-07	X			

MASTER

REC
FEB 14 1993
OSTI

JR

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

JAN 26 1995
55 Sta. 5

ENGINEERING DATA TRANSMITTAL

Page 1 of 1
1. EDT 609877

2. To: (Receiving Organization) Distrubtion	3. From: (Originating Organization) PFP Process Engineering	4. Related EDT No.: N/A
5. Proj./Prog./Dept./Div.: HC-21C/15530	6. Cog. Engr.: W. S. Lewis	7. Purchase Order No.: N/A
8. Originator Remarks: USQ for ECN #705019L applies for this test report. No Unreviewed Safety Question exists.		9. Equip./Component No.:
		10. System/Bldg./Facility: 73T/234-5Z/2Z
11. Receiver Remarks:		12. Major Assm. Dwg. No.:
		13. Permit/Permit Application No.: N/A
		14. Required Response Date:

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 Desig- nator	Reason for Trans- mittal	Origi- nator Dispo- sition	Receiv- er Dispo- sition
1	WHC-SD-CP-TRP-060	1	0	Heat Exchanger Bypass Test Report	N/A	1	1	

16. KEY									
Approval Designator (F)		Reason for Transmittal (G)				Disposition (H) & (I)			
E, S, Q, D or N/A (see WHC-CM-3-5, Sec.12.7)		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 Approval Designator for required signatures)						(G)	(H)
Reason	Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M) MSIN
1	1	Cog.Eng. W. S. Lewis	<i>W. S. Lewis</i>	1/17/95	T5-55				
1	1	Cog. Mgr. M. W. Gibson	<i>M. W. Gibson</i>	1/17/95	T5-55				
		QA							
		Safety							
		Env.							
3		M. L. De Vries			T5-55				

18. Signature of EDT Originator <i>M. L. De Vries</i> 1/17/95	19. Authorized Representative for Receiving Organization <i>N/A</i>	20. Cognizant Manager Date <i>M. W. Gibson</i> 1/17/95	21. DOE APPROVAL (if required) Ctrl. No. N/A ☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments
---	---	--	---

RELEASE AUTHORIZATION

Document Number: WHC-SD-CP-TRP-060, REV.0

Document Title: Heat Exchanger Bypass Test Report

Release Date: January 25, 1995

**This document was reviewed following the
procedures described in WHC-CM-3-4 and is:**

APPROVED FOR PUBLIC RELEASE

WHC Information Release Administration Specialist:

Kara M. Broz

January 25, 1995

TRADEMARK DISCLAIMER. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors.

This report has been reproduced from the best available copy. Available in paper copy and microfiche. Printed in the United States of America. Available to the U.S. Department of Energy and its contractors from:

U.S. Department of Energy
Office of Scientific and Technical Information (OSTI)
P.O. Box 62
Oak Ridge, TN 37831
Telephone: (615) 576-8401

Available to the public from:

U.S. Department of Commerce
National Technical Information Service (NTIS)
5285 Port Royal Road
Springfield, VA 22161
Telephone: (703) 487-4650

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

SUPPORTING DOCUMENT		1. Total Pages 18
2. Title Heat Exchanger Bypass Test Report	3. Number WHC-SD-CP-TRP-060	4. Rev No. 0
5. Key Words HC-21C, Heat Exchangers, Furnaces, Pu Bearing Material	6. Author Name: M. L. De Vries <u>M. L. De Vries</u> Signature Organization/Charge Code 15530/K6018	
7. Abstract Document provides the results of the Heat Exchanger Bypass Test Procedure performed to determine if the heat exchangers were causing condensation to occur in the HC-21C furnaces' off-gas systems.		
		8. RELEASE STAMP <div>OFFICIAL RELEASE DATE JAN 26 1995 55 Sta. 5</div>

PFP SLUDGE STABILIZATION	HEAT EXCHANGER BYPASS TEST REPORT	WHC-SD-CP-TRP-060 Page 2 of 18 Rev. 0
-----------------------------	-----------------------------------	--

TABLE OF CONTENTS

I.	INTRODUCTION	3
II.	TEST SUMMARY	3
	FIGURE 1	4
	FIGURE 2	5
III.	CONCLUSIONS	6
	APPENDIX A	7

I. INTRODUCTION

This test report documents the results that were obtained while conducting the test procedure which bypassed the heat exchangers in the HC-21C sludge stabilization process. The test was performed on November 15, 1994 using WHC-SD-CP-TC-031, "Heat Exchanger Bypass Test Procedure."

The primary objective of the test procedure was to determine if the heat exchangers were contributing to condensation of moisture in the off-gas line. This condensation was observed in the rotameters. Also, a secondary objective was to determine if temperatures at the rotameters would be too high and damage them or make them inaccurate without the heat exchangers in place.

II. TEST SUMMARY

Both furnaces were charged using operating procedure ZO-160-032 and temperature test data taken as the items were stabilized in the furnace. For Furnace 1, a sludge item was charged and processed under furnace cycle 1. For Furnace 2, an oxide item, which is drier than a sludge item, was loaded and run under furnace cycle 3. Temperatures of the off-gas piping were taken every half-hour. The test procedure is attached with the readings that were recorded.

Operation of Furnace 1 showed no water formation in the rotameters, however, green chunks (corrosion products from the Inconel 600 piping) appeared at about 770° C furnace temperature in the rotameters. Temperatures at the inlet of the rotameters to Furnace 1 extended up to 164° F (73°C). Figure 1 is a graph that displays inlet rotameter (number 1) temperatures at different furnace temperatures.

Operation of Furnace 2 displayed condensation starting at furnace temperature of 260° C. At this time the temperature at the rotameter was 88° F. The solution started as a brown clear solution and then turned green. Rotameter flow was adjusted when water started forming and later in the furnace cycle the water had dried up in the rotameter. The water was thought to be residual left in the system from previous charges. Furnace 2 temperatures at the inlet to the rotameter were slightly lower only reaching 121° F (50° C). Figure 2 is a graph that displays inlet rotameter (number 2) temperatures at different furnace temperatures.

FIGURE 1

Furnace 1 Rotameter

Temperature Profile

FIGURE 2

The temperature profile for the piping on furnace 1 was significantly different than the profile on furnace 2 piping. The profiles are different mostly likely due to the piping insulation configuration being slightly different for the two furnaces. To bypass the heat exchangers some insulation was removed from the off-gas piping leaving the two systems slightly different which altered the temperature profile of the off-gas piping. Also, Furnace 1 and 2 were using different furnace cycles which would affect the temperature profile of the off-gas piping.

Another difference between the two furnace cycles is that water was seen in the rotameter for Furnace 2 but not Furnace 1 and solids were seen in Furnace 1 rotameter. Water formation in one rotameter and solids in another is more than likely due to how the piping condition was left from previous cycles and if there was some liquid already present in the piping.

Continued operation of the furnaces with the heat exchangers bypassed showed the rotameters to be dry when running dry oxide feed items. However, a slug of green liquid entered rotameter from the Furnace 2 when running a 'wetter' oxalate charge. The liquid is thought to have come from condensate holdup in the off-gas piping pigtail. Bypassing the heat exchanger prevented water from condensing out in the heat exchanger but water was still condensing out in another area of the off-gas system.

III. CONCLUSIONS

Conclusions drawn from this test show that the heat exchangers were contributing to the condensation of liquid present in the rotameters, however, they were not the sole source. Additional testing of the off-gas system to determine if the filters are also causing condensation to occur is being performed by "HC-21C Off-Gas Test Procedure", WHC-SD-CP-TC-032.

Temperatures for the rotameters seem to demonstrate that temperatures without the heat exchangers are not high enough to be a problem. Rotameters can take 175 °F without melting and are accurate up to 130 °F. Although the rotameters handled the temperatures during this test, as changes are made on the off-gas piping for further testing in WHC-SD-CP-TC-032, high temperature rotameters may be needed.

APPENDIX A

TEST DATA SHEETS

RELEASE AUTHORIZATION

Document Number: WHC-SD-CP-TC-031, REV.0

Document Title: Heat Exchanger Bypass Test Procedure

Release Date: November 15, 1994

This document was reviewed following the
procedures described in WHC-CM-3-4 and is:

APPROVED FOR PUBLIC RELEASE

WHC Information Release Administration Specialist:

Kara M. Broz

November 15, 1994

TRADEMARK DISCLAIMER. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors.

This report has been reproduced from the best available copy. Available in paper copy and microfiche. Printed in the United States of America. Available to the U.S. Department of Energy and its contractors from:

U.S. Department of Energy
Office of Scientific and Technical Information (OSTI)
P.O. Box 62
Oak Ridge, TN 37831
Telephone: (615) 576-8401

Available to the public from:

U.S. Department of Commerce
National Technical Information Service (NTIS)
5285 Port Royal Road
Springfield, VA 22161
Telephone: (703) 487-4650

PFP SLUDGE
STABILIZATION

HEAT EXCHANGER BYPASS TEST REPORT

WHC-SD-CP-TRP-060
Page 9 of 18 Rev. 0

NOV 15 1994
55 *SLAS*

ENGINEERING DATA TRANSMITTAL

Page 1 of 1
1. EDT 608704

2. To: (Receiving Organization) Distrubtion	3. From: (Originating Organization) PFP Process Engineering	4. Related EDT No.: N/A
5. Proj./Prog./Dept./Div.: HC-21C/15530	6. Cog. Engr.: W. S. Lewis	7. Purchase Order No.: N/A
8. Originator Remarks: USQ for ECN #705019L applies for this test procedure. No Unreviewed Safety Question exists.		9. Equip./Component No.:
		10. System/Bldg./Facility: 73T/234-5Z/2Z
11. Receiver Remarks:		12. Major Assm. Dwg. No.:
		13. Permit/Permit Application No.: N/A
		14. Required Response Date:

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-CP-TC-031	1	0	Heat Exchanger Bypass Test Procedure	N/A	1	1	

16. KEY									
Approval Designator (F)		Reason for Transmittal (G)				Disposition (H) & (I)			
E, S, Q, D or N/A (see WHC-CM-3-5, Sec.12.7)		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 Approval Designator for required signatures)						(G)	(H)
Reason	Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M) MSIN
1	1	Cog.Eng. W. S. Lewis	<i>W. S. Lewis</i>	11/15/94	T5-55				
1	1	Cog. Mgr. M. W. Gibson	<i>M. W. Gibson</i>	11/15/94	T5-55				
		QA							
		Safety							
		Env.							
1		M. L. De Vries			T5-55				
1		Operations <i>Shirley B. Hunter</i>		11/15/94					
18.		19.			20.		21. DOE APPROVAL (if required) Ctrl. No. N/A		
<i>M. L. De Vries</i> 11-15-94 Signature of EDT Originator		Authorized Representative Date for Receiving Organization			<i>M. W. Gibson</i> 11/15/94 Cognizant Manager Date		☐ Approved ☐ Approved w/comments ☒ Disapproved w/comments		

SUPPORTING DOCUMENT

1. Total Pages 7

2. Title

Heat Exchanger Bypass Test Procedure

3. Number

WHC-SD-CP-TC-031

4. Rev No.

0

5. Key Words

HC-21C, Heat Exchangers, Furnaces, Pu Bearing
Material

6. Author

Name: M. L. De Vries

M. L. De Vries
Signature

Organization/Charge Code 15530/K6018

APPROVED FOR
PUBLIC RELEASE

LMB 11/15/94

7. Abstract

Document provides instructions for testing the HC-21C muffle furnace process when bypassing the heat exchangers in the off-gas system.

8. RELEASE STAMP

OFFICIAL RELEASE
BY WHC
DATE NOV 15 1994

55

SLA-5

PFP SLUDGE STABILIZATION	HEAT EXCHANGER BYPASS TEST REPORT	WHC-SD-CP-TRP-060 Page 11 of 18 Rev. 0
-----------------------------	-----------------------------------	---

PFP SLUDGE STABILIZATION	HEAT EXCHANGER BYPASS TEST PROCEDURE	WHC-SD-CP-TC-031 Page 2 of 7 Rev. 0
-----------------------------	---	--

TABLE OF CONTENTS

	PAGE
1. TEST ITEM IDENTIFICATION	3
2. GENERAL DESCRIPTION	3
2.1 Test Objective	3
2.2 Test Method	3
3. TEST CONDITION LIMITS	3
4. TOOLS	3
5. FACILITIES, EQUIPMENTS, AND MATERIALS	3
6. SAFETY	4
6.1 Safety	4
6.2 Pre-job Meeting	4
6.3 Table 1 - PRE-JOB SAFETY/OPERABILITY BRIEFING LIST	4
7. TEST DATA	5
8. PROCEDURE	5
7. DATA SHEETS	
FURNACE # 1 TEMPERATURE DATA SHEET	6
FURNACE # 2 TEMPERATURE DATA SHEET	7

PFP SLUDGE STABILIZATION	HEAT EXCHANGER BYPASS TEST REPORT	WHC-SD-CP-TRP-060 Page 12 of 18 Rev. 0
-----------------------------	-----------------------------------	---

PFP SLUDGE STABILIZATION	HEAT EXCHANGER BYPASS TEST PROCEDURE	WHC-SD-CP-TI-031 Page 3 of 7
-----------------------------	---	---------------------------------

1. TEST ITEM IDENTIFICATION

The following equipment will be used to perform the test procedure. One furnace, FUR-1 or FUR-2 will be used to stabilize Plutonium (Pu) bearing material. The off-gas system for the furnace will also be used which includes a ceramic filter, heat exchanger, rotameter, needle valve and the 26 inch vacuum system. During the test, the heat exchanger of the off-gas system will be bypassed.

2. GENERAL DESCRIPTION

2.1 Test Objective

The HC-21C Muffle Furnace Process has been experiencing problems with corrosion of the off-gas piping system. During the processing cycle, condensation is forming and corroding the off-gas piping. The corrosion products build up in the rotameters and cause them to be dysfunctional. The condensation is suspected to be occurring in the heat exchanger, so the test will bypass the heat exchanger to verify this.

This process test will help to establish a temperature profile for the off-gas system near the rotameter (FI-21C-1 or FI-21C-2). Also, this information will be used to help determine the location and cause of water condensation that is occurring in the off-gas equipment.

2.2 Test Method

The process test will include operating one of the two furnaces in Room 230A to stabilize Pu bearing material. The off-gas from the process under normal conditions goes through a heat exchanger before entering the 26" vacuum system but during the process test the heat exchanger will be bypassed. During the test run, various temperature readings will be taken and visual inspections done.

3. TEST CONDITION LIMITS

Work package 2Z-94-02073 has had modification work per ECN #705019L completed and signed off.

Modification work complete:

Greg Zuster 11/15/94
TEST ENGINEER

If excessive liquid makes rotameter uncontrollable stop test procedure.

If temperature on lines outside of the glovebox that are not insulated rise above > 180° F, stop test procedure.

4. INSTRUMENTS

2 Portable Thermocouple

5. FACILITIES, EQUIPMENTS, AND MATERIALS

An ECN, #705019L, has been written to allow the heat exchangers to be bypassed.

6. SAFETY

6.1 Safety

All individuals performing this procedure are required to read, understand and comply with the applicable RWP that governs the work within this procedure.

6.2 Pre-job Meeting

A pre-job meeting shall be held prior to this task. The pre-job meeting shall be documented in Table 1 by Test Engineer and all persons involved in the meeting.

Pre-job complete:

Greg Zuercher 11/15/94
TEST ENGINEER

6.3 Table 1

PRE-JOB SAFETY/OPERABILITY BRIEFING LIST

[illegible]

PFP SLUDGE STABILIZATION	HEAT EXCHANGER BYPASS TEST REPORT	WHC-SD-CP-TRP-060 Page 14 of 18 Rev. 0
-----------------------------	-----------------------------------	---

PFP SLUDGE STABILIZATION	HEAT EXCHANGER BYPASS TEST PROCEDURE	WHC-SD-CP-TI-031 Page 5 of 7
-----------------------------	---	---------------------------------

7. TEST DATA

Data to be recorded during this test procedure include temperatures and visual information of water formation taken during a processing cycle to stabilize Pu bearing material.

8. PROCEDURE

Adjustments to the test procedure may be necessary in the field as the test run progresses. Therefore the Test Engineer is permitted to accommodate minor changes in direction resulting from facility description variants. Each change shall approved per WHC-CM-3-5, Section 12.7. Change authorizations obtained by the telephone shall be noted as such.

A. PROCESS TEST

1. Test engineer will determine which furnace will be used for the test procedure.
2. Using ZO-160-032, have an operator prepare one charge and initiate appropriate heating cycle for the HC-21C furnace that will be used for the test.
3. Record the following information on the charge to be processed.

Furnace Used:

Description of Material:

Furnace Program Used:

	1	2
	Sludge	Oxid
	1	2

4. Record the following data on the appropriate furnace data sheet, (FURNACE # 1 or FURNACE # 2 TEMPERATURE DATA SHEET) during the process.

a. Every 1/2 hour record the following:

- Furnace temperature
- Inlet temperature to rotameter FI-21C-1 or FI-21C-2
- Outlet temperature to rotameter FI-21C-1 or FI-21C-2
- Outlet temperature from needle valve, V-21C-1 or V-21C-2
- Inlet temperature to V-21C-10, 26" vacuum system isolation valve (located in room 263)
- Outlet temperature from V-21C-10, 26" vacuum system isolation valve (located in room 263)

- b. Watch for formation of water in the rotameter. If water forms in rotameter, record the time and temperature at which the water formed. Please record quantified amount and any description of the liquid if unusual.

PFP SLUDGE
STABILIZATION

HEAT EXCHANGER BYPASS TEST
PROCEDURE

WHC-SD-CP-TI-031
Page 6 of 7

FURNACE # 1 TEMPERATURE DATA SHEET

Time	0955	1025	1055	1134	1202	1235	1302	1333	1400	1430	1458	1530	1600	1630	1700	1730
Date	11/15/94	11/15/94	11/15/94	11-15-94	11-15-94	11-15-94	11-15-94	11-15-94	11-15-94	11-15-94	11-15-94	11-15-94	11-15-94	11-15-94	11-15-94	11-15-94
Initial	27	27	27	LC	LC	LC	LC	MLD	MLD	MLD	MLD	MLD	MLD	SKN	SKN	SKN
Furnace Temperature TIC-21C-1	33°C	144°C	177°C	174°C	175°C	267°C	398°C	541°C	623°C 823°C	713°C	772°C	840°C	902°C	918°C	972°C	1002°C
Rotameter(FI-21C-1) Inlet Temp.	75°F	78°F	98°F	96°F	102°F	109°F	109°F	118°F	122°F	129°F	132°F	137°F	149°F	146°F	158°F	161°F
Rotameter(FI-21C-1) Outlet Temp.	75°F	77°F	93	92°F	97°F	104°F	103°F	112°F	116°F	119°F	118°F	129°F	128°F	135°F	136°F	141°F
Temperature after valve, V-21C-1	75°F	76°F	90 92°F	90°F	94°F	99°F	99°F	101°F	106°F	115°F	116°F	123°F	125°F	125°F	135°F	131°F
Temperature before valve, V-21C-10 (Room 263)	75°F	76°F	73°F	75°F	73°F	76°F	76°F	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Temperature after valve, V-21C-1 (Room 263)	75°F	76°F	92 92°F	92°F	96°	102°F	102°F	102°F	107°F 98°F	116°F	117°F	125°F 119°F	126°F	127°F	134°F	134°F

ILM
11/15/94
mws

TEMPERATURE OF WATER CONDENSATION: _____

TIME OF WATER CONDENSATION: _____

QUANTIFIED AMOUNT OF WATER CONDENSATION: _____

OBSERVATIONS/COMMENTS: OFF-GAS TURNED YELLOW-GREEN @ 295°C (FURNACE TEMP).

During 1458 reading noticed green chunks in Rotameter

PFP SLUDGE
STABILIZATION

HEAT EXCHANGER BYPASS TEST REPORT

WHC-SD-CP-TRP-060
Page 15 of 18 Rev. 0

NOTE AT 1530 pipe where insulation ends was 167°F

Time	1500	1800	1900	1930	2000
Date	11-15-94	11-15-94	11-15-94	11-15-94	11-15-94
Initial	BRW	BRW	BRW	BRW	BRW
TIC-21C-1	1000°C	896°C	731°C	636°C	559°C
FI-21C-1 Inlet	164°F	167°F	163°F	168°F	164°F
FI-21C-1 Outlet	141°F	147°F	145°F	154°F	154°F
V-21C-1 Inlet	135°F	137°F	137°F	147°F	142°F
V-21C-1 Outlet	132°F	137°F	137°F	145°F	140°F

AT 1840 The ^{off gas} flow rate was increased from 120 cfm to 140 cfm

PFP SLUDGE
STABILIZATION

HEAT EXCHANGER BYPASS TEST
PROCEDURE

WHC-SD-CP-TI-031
Page 7 of 7

FURNACE # 2 TEMPERATURE DATA SHEET

Time	1000	1030	1100	1137	1204	1237	1304	1338	1404	1435	1502	1533	1600	1630	1700	1730
Date	11/15/94	11/15/94	11/15/94	11-15-94	11-15-94	11-15-94	11-15-94	11-15-94	11-15-94	11-15-94	11-15-94	11-15-94	11-15-94	11-15-94	11-15-94	11-15-94
Initial	27	27	27	19C	19C	19C	19C	MLD	MLD	MLD	MLD	MLD	MLD	27	27	27
Furnace Temperature TIC-21C-2	60°C	89°C	349°C	521°C	613°C	713°C	767°C	837°C	892°C	931°C	964°C	1002°C	1000°C	913°C	803°C	687°C
Rotameter(FI-21C-2) Inlet Temp.	76°F	80°F	90°F	96°F	86°F	91°F	98°F	99°F	104°F	110°F	107°F	114°F	113°F	118°F	121°F	116°F
Rotameter(FI-21C-2) Outlet Temp.	76°F	79°F	88°F	94°F	85°F	86°F	94°F	100°F	100°F	103°F	102°F	108°F	111°F	115°F	114°F	114°F
Temperature after valve, V-21C-2	76°F	78°F	85°F	91°F	82°F	84°F	91°F	97°F	96°F	102°F	103°F	106°F	107°F	108°F	112	105°F
Temperature before valve, V-21C-10 (Room 263)	75°F	76°F	73	75°F	73°F	76°F	76°F	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Temperature after valve, V-21C-12 (Room 263)	76°F	78°F	86°F	91°F	85°F	86°F	93°F	98°F	97°F	105°F	108°F	108°F	111°F	113°F	112°F	114°F

Approved
N/A
Signature
11/15/94
WHS

TEMPERATURE OF WATER CONDENSATION: 260°C

TIME OF WATER CONDENSATION: 1044 (Light Fogging in Rotameter)

QUANTIFIED AMOUNT OF WATER CONDENSATION: _____

OBSERVATIONS/COMMENTS: Started as brown clear solution, Temp of rotameter inlet at time of solution appearing 86°F, starting to turn green 362°C. Rotameter flow adjusted after 1137 readings. "WATER" IN ROTAMETER just gradually showed before 1204 readings (~600°C). WATER IN ROTAMETER is gone by 890°C.

AT 1450 took pleviglass off furnace 2 window - glovebox temps dropped

PFP SLUDGE
STABILIZATION

HEAT EXCHANGER BYPASS TEST REPORT

WHC-SD-CP-TRP-O60
Page 17 of 18 Rev. 0

PFP SLUDGE STABILIZATION	HEAT EXCHANGER BYPASS TEST REPORT	WHC-SD-CP-TRP-000 Page 18 of 18 Rev. 0
-----------------------------	-----------------------------------	---

Time	1800	1830	1900	1930	2000
Date	11-15-94	11-15-94	11-15-94	11-15-94	11-15-94
Initial	BRN	BRN	BRN	BRN	BRN
TIC-21C-2	611°C	541°C	476°C	428°C	381°C
FI-21C-2 Inlet	121°F	121°F	120°F	121°F	119°F
FI-21C-2 Outlet	116°F	112	114°F	114°F	113°F
V-21C-2 Inlet	115°F	112	113°F	113°F	113°F
V-21C-2 Outlet	110°F	111	113°F	111°F	111°F

At 1840 the off gas flow rate was increased from 120 cfm to 140 cfm.