MAR 12 1998

ENGINEERING DATA TRANSMITTAL

1. EDT

Page 1 of 259

622203

2. To: (Receiving Organization) SST Retrieval Projects		3. From: (Originating Organization) SST Retrieval Projects		4. Related EDT No.: NA	
5. Proj./Prog./Dept./Div.: W-320		6. Design Authority/ Design Agent/Cog. Engr.: John Bailey		7. Purchase Order No.: NA	
8. Originator Remarks: For Release				9. Equip./Component No.:	
				10. System/Bldg./Facility: annulus vent/241-AY-102	
11. Receiver Remarks: 11A. Design Baseline Document? ☐ Yes ☒ No				12. Major Assm. Dwg. No.: H-2-64462	
				13. Permit/Permit Application No.:	
				14. Required Response Date: Feb 27, 1998	

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	HNF-2317		0	Project W-320 High Vacuum 241-AY-102 Annulus Ventilation System Operability Test Report	SQ	2	NA	NA

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

17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)									
(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(G) Reason	(H) Disp.	(J) Name	(K) Signature
1	1	Design Authority	JW Bailey	1/27/98	S2-48	3		W.J. Powell	(1)
1	1	Test Director	KJ Anderson	2/2/98	S5-04	3		GN Hanson	(1)
1	1	Cog/Test Eng.	JM Jones	1/27/98	S5-13	3		W-320 PROJECT FILE	(1)
1	1	Cog. Mgr.	John Bailey	1/27/98	S5-05	3		SW Shaw	(1)
1	1	QA KC Conrad	Keith Conrad	2-27-98	S2-48	3		JR Bellomy III	(1)
1	1	Safety	SU Zaman	2/5/98	S5-12	3		J. Lohrasbi	(1)
		Env.						R.G. Carothers	(1)

18. Signature of EDT Originator SW Shaw 2/27/98		19. Authorized Representative for Receiving Organization JW Bailey 2/27/98		20. Design Authority/Cognizant Manager JW Bailey 2/26/98		21. DOE APPROVAL (if required) Ctrl. No. ☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments	
--	--	---	--	---	--	---	--

Project W-320 High Vacuum 241-AY-102 Annulus Ventilation System Operability Test Report

J. W. Bailey

NHC, Richland, WA 99352

U.S. Department of Energy Contract DE-AC06-96RL13200

EDT/ECN: 622203

UC: 510

Org Code: 8C452

Charge Code: D2MA1

B&R Code: EW3130010

Total Pages: 258

Key Words: 241-AY-102, Ventilation, Annulus, Flow rate, structural, cross contamination, sluicing, radon, exhauster

Abstract: This report documents the test results of OTP-320-001, Tank 241-AY-102 Annulus Ventilation System Testing. Included in the appendices are:

1. Supporting documentation prepared to demonstrate the structural integrity of the tank at high annulus vacuum (<20 INWG), and
2. a report that identifies potential cross connections between the primary and annulus ventilation systems. These cross connections were verified to be eliminated prior to the start of testing.

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.

Printed in the United States of America. To obtain copies of this document, contact: Document Control Services, P.O. Box 950, Mailstop H6-08, Richland WA 99352, Phone (509) 372-2420; Fax (509) 376-4989.

Release Approval

Date

Approved for Public Release

HNF-2317

Rev. 0

**PROJECT W-320 HIGH VACUUM 241-AY-102 ANNULUS
VENTILATION SYSTEM OPERABILITY TEST REPORT**

by

**S.W. Shaw
February 27, 1998**

contact

J. R. Bellomy III

EXECUTIVE SUMMARY

INTRODUCTION

Testing of the 241-AY-102 Annulus Ventilation System (269-A-19) was performed for three reasons:

1. To verify that the annulus inlet blocking upgrade functioned as planned.
2. To verify efforts to block cross connections between the primary and annulus ventilation systems were successful, allowing the annulus to be operated at a higher vacuum level than the primary.
3. To demonstrate the ability of the re-sheaved exhaust fan to establish the necessary flow through the distributor slots at the bottom of the annulus to cool the waste tank's contents when supplemented by the "high heat" contents of 241-C-106 as part of Project W-320.

Background

As a precursor to the testing, an evaluation was conducted to establish that the structural integrity of the annulus, primary tank, and annulus ventilation system would not be compromised as a result of high vacuum (less than 20 INWG) testing of the annulus. It was determined that both the annulus and the primary tank had significant margin for high vacuum operation. The duct work and associated components (IE. filter housings, etc) had been designed and/or specified for operating at vacuum levels to 20 INWG. As part of this evaluation, there was a question raised regarding the heater housing upstream of the HEPA filters. Based on a field inspection of the housing, the decision was made to install a new housing (reference ECN 611046) prior to testing. The letter report that addresses the analysis/reviews performed to establish the acceptability of operating the annulus ventilation system at 20 INWG vacuum levels is attached as Appendix A.

Another precursor to the performance of annulus ventilation system testing was a review of the AY-102 waste tank's design and current operating configuration. It was necessary to establish that all potential cross connections between the primary and annulus ventilation spaces had been blocked/eliminated prior to the conduct of testing, thus minimizing the potential for additional contamination of the tank's annulus. In addition to a review of design media, video was used to verify that the annulus leak detection and pump out pits were configured as identified. Potential cross connection pathways, and how they were eliminated from further consideration as a pathway for contamination was documented in an informal report, and is included as Appendix B.

Annulus ventilation system testing was conducted using Tank Farm's Operating Procedure OTP-320-001, that was reviewed and approved by the Joint Test Review Group. A test damper assembly consisting of a 12" damper and G-1 filter housing containing an 80% roughing filter was installed on 12" annulus riser 19B (ECN 645848L). This damper assembly was used to ensure control of vacuum levels within the tank's annulus. With the exhaust fan operating, the vacuum within the tank annulus was incrementally increased by closing the test damper assembly. A butterfly damper upstream of the exhaust fan was used to maintain isokinetic (required for constant air monitor accuracy) flows through the stack, maintaining flow between 700 and 1000 feet per minute (FPM) (860 and 1230 CFM). System data was recorded 30 and 60 minutes after each 1 INWG incremental change an annulus vacuum.

Once the test damper was fully closed, the measured stack flow indicated the total flow through the slots at the bottom of the annulus. Testing then proceeded by continuing to open the flow control damper (MK-6501) causing the vacuum in the annulus to increase along with the flow through the distributor slots. Similar to the methodology employed in closing the test damper, vacuum in the annulus was increased 1 INWG increments, and data obtained 30 and 60 minutes after the new operating parameters had been established.

The intent of testing was to establish a flow of 1000 FPM measured at the stack through the annulus distributor (floor) slots. Initial efforts to accomplish this were thwarted by a flow instability (as indicated by a fluctuation in system flow of ± 200 FPM in a 10 second period). This flow instability was the result of the fan's operating in an unstable region near the peak of its performance curve. However, by closing the radial damper at the fan inlet, it was possible to stabilize the system flow, albeit at the somewhat diminished velocity of 950 FPM (1168 CFM) at an annulus vacuum of 15.5 INWG.

The radial damper consists of two perforated plates, one free to rotate relative to the other. By changing the relative position of the plates, the total flow area provided by the perforations can be varied between 40 and 70% of the maximum. Closing the damper caused a slight increase in the pressure drop across it, and served to change the velocity profile of the air entering the fan, thus stabilizing the flow.

With the system in a stable operating configuration, a prolonged period of data acquisition was embarked upon. System operating data, environmental conditions (supplemented by PNNL weather station data), readings from operating thermocouples in the tank sludge level and insulating concrete were recorded every three hours for approximately 14 days. These data allow an assessment to be made as to the cooling capabilities of the annulus ventilation system and may be used to draw some conclusion regarding the air slots and their condition. A compilation of the data recorded during testing by Operations and PNNL is included as Appendix C.

Throughout the conduct of testing, the annulus ventilation system's CAM was monitored for indication that a flow path between the primary and annulus ventilation systems existed. Similarly, the primary ventilation space operating vacuum was scrutinized, watching for a change in primary ventilation space pressure corresponding to an increase in the annulus vacuum.

Report Format

Due to lessons learned, and additional information obtained during testing, the original OTP-320-001 was revised several times during the course of testing. Originally approved as revision A-0, testing was completed under revision A-3, with PCA ETF 98-081. In the interest of clarity, procedure revision A-3 with the PCA incorporated is included in the main body of the test

report, followed by all of the Test Log entries, Test Exception reports, Signature Logs, and Data Sheets prepared during the course of testing.

Appendix D is comprised of Revision A-0 of the test procedure and the associated PCA sheets to effect the procedure changes.

CONCLUSIONS AND OBSERVATIONS

Ventilation System Performance

Minimum, maximum and average values for parameters used to assess the annulus ventilation system's performance during testing are shown in Table 1 below. Similarly, the data obtained for the system and thermocouple response are presented graphically in Appendix E. Of interest is that the measured system flows decrease with decreasing temperature. This is to be expected as friction losses through the slots increase with the decrease in temperature.

TABLE 1
ANNULUS VENT SYSTEM TEST DATA SUMMARY

	TEST AVERAGES (Does not include max. vacuum testing)	MAXIMUM (Does not include max. vacuum testing)	MINIMUM (Does not include max. vacuum testing)
FLOW (FPM)	875	1100	800
FLOW (CFM)	1077	1353	984
ANN. VAC (inWG)	16	16	15
BAR. PRESS (INHG)	29	29.376	28.694
T in (F)	41	72	27
T out (F)	59	77	50
CAM (CPM)	413	1100	110

Data points for annulus ventilation system flow rates and vacuum obtained during testing were compared against an analysis performed to establish a system curve for the system. Appendix F shows a plot of the calculated system curve, and two data points established once the test damper was completely closed. Note that the vacuum level calculated/measured is the vacuum in the annulus, not that generated at the fan. Based on the fans calculated maximum static pressure of 17.98 INWG, it appears that there is an approximate 2.5 INWG (18-15.5) pressure loss between the annulus and the fan inlet with clean HEPA filters. Appendix F also includes a figure which demonstrates the effects of the air's entrance temperature on system pressure losses.

To establish that flow measured out the stack was an accurate indication of the flow through the slots, several activities were completed. First, during the testing, a pitot traverse was made of the inlet duct to the annulus. The location for the traverse was through an existing temperature probe penetration, approximately 1 duct diameter upstream of a 90 degree elbow, and

approximately 8 duct diameters down stream from any other flow perturbations. The result of this effort was a flow measurement through the inlet duct which is very close to that measured at the stack. Measured values, error calculation and a plot of the velocity profiles with the associated error are provided in Appendix G.

Then, at the conclusion of testing, the inlet damper to the annulus was completely closed. Flow measured at the stack went to zero, while annulus vacuum increased to 16.5 INWG. Therefore, based on these two methods for determining system air in leakage, it can be concluded that flows reported at the stack are an accurate indication of flow through the slots at the bottom of the annulus.

Ventilation System Isolation

The annulus ventilation system was operated for approximately 14 days at a vacuum of 15.5 INWG with respect to atmosphere, or almost 14 INWG negative with respect to the primary ventilation space. No evidence of contamination in the annulus as a result of testing was discovered during this period. As such, it is concluded that the all pathways that would allow communication between the primary and annulus ventilation spaces have been successfully blocked.

Air Slot Condition

Plots of the thermocouple data obtained during testing indicate that the air slots are open. This conclusion is based upon the relatively uniform decrease in temperatures reported by the thermocouples in the concrete (see Appendix E). Although there is some initial offset between recorded temperatures, they appear to drop through an equivalent temperature change.

Radon

Figure 7 in Appendix E plots recorded CAM readings (divided by 10 for scaling purposes), along with system vacuum, flow, temperature and barometric data versus time. It can be seen that upon initial start-up and increasing vacuum, CAM readings rose to a level of almost 1800 CPM. They then dropped to zero as the fan was shutdown to replace the sheaves. Notice that once again, the CAM levels were elevated, and remained high for approximately 80 hours after restarting the system. There was then an almost step change in activity, CAM levels dropping to approximately 150 CPM. For the remainder of testing CAM levels would rise and fall between 110 and 600 CPM (average 285 CPM) with no clear connection to either barometric pressure, temperature, or system vacuum.

102-AY Tank Waste Heat Removal

Approved criteria for the annulus ventilation system's required flow rate for tank waste cooling has yet to be established. Therefore, while testing was adequate to demonstrate the performance envelope of the system, no determination can be made within this document as to whether the annulus slot flows measured are sufficient to adequately cool the contents of AY-102 after retrieval of C-106.

TABLE OF CONTENTS

1.0	PURPOSE AND SCOPE	3
1.1	PURPOSE	3
1.2	SCOPE	3
2.0	INFORMATION	4
2.1	TERMS AND DEFINITIONS	4
2.2	RESPONSIBILITIES	4
2.3	REFERENCES	6
2.4	GENERAL INFORMATION	6
2.5	RECORDS	9
3.0	PRECAUTIONS AND LIMITATIONS	10
3.1	RADIATION AND CONTAMINATION CONTROL	10
3.2	ENVIRONMENTAL COMPLIANCE	10
3.3	LIMITS	11
4.0	PREREQUISITES	15
4.1	SPECIAL TOOLS, EQUIPMENT, AND SUPPLIES	15
4.2	PERFORMANCE DOCUMENTS	15
4.3	CONDITIONS AND ACTIONS	15
5.0	PROCEDURE	18
5.1	INITIAL CONDITIONS	18
5.2	TEST ANNULUS FLOW	19
5.3	RESTORATION	26
5.4	SYSTEM RECOVERY PLAN	27
5.5	SYSTEM RESTART FROM SHORT TERM SHUTDOWN	28
	ATTACHMENT 1, OTP-320-001 TEST LOG	29
	ATTACHMENT 2, OTP-320-001 TEST EXCEPTION REPORT	36
	ATTACHMENT 3, OTP-320-001 SIGNATURE LOG	38
	ATTACHMENT 4, VENTILATION SYSTEM DATA SHEET	42
	ATTACHMENT 5, TEMPERATURE DATA SHEET	56
	FIGURE 1 - W-320 ANNULUS VENTILATION OTP TEST LOGIC	132
	FIGURE 2 - W-320 ANNULUS VENITLATION SYSTEM SCHEMATIC	133
	PROCEDURE HISTORY SIGNATURE SHEET	134

TABLE OF CONTENTS
(Continued)

APPENDIX A	STRUCTURAL ASSESSMENT
APPENDIX B	CROSS CONTAMINATION PATHWAYS EVALUATION
APPENDIX C	TEST DATA COMPILATION
APPENDIX D	OTP-320-001, REV A-0, SIGN-OFFS, AND ASSOCIATED PROCEDURE CHANGE AUTHORIZATION FORMS
APPENDIX E	TEST DATA PLOTS
APPENDIX F	CALCULATED SYSTEM CURVES VS TEST DATA
APPENDIX G	INLET DUCT PITOT TRAVERSE DATA

**W-320 ANNULUS VENTILATION SYSTEM
OPERATIONAL TEST**

Last Full Revision: A-0

Release Date: 1/19/98

USQ Screening Number: TF-97-1005

Approval Designator: ESQ

Current Modification: A-3

USQ Screening Number: TF-97-1005

Approval Designator: N/A

PCA Incorporated: ETF-98-060

POSITION/ORG	DELEGATE	DATE
NPO	<u>T. Pyle</u>	<u>1/27/98</u>
Shift Manager	<u>K.J. Anderson</u>	<u>1/27/98</u>
Design Authority	<u>W.J. Powell</u>	<u>1/27/98</u>
COG Engineer	<u>J.M. Jones</u>	<u>1/27/98</u>
Acceptance Review	<u>D.C. Ashworth</u>	<u>1/27/98</u>
Approval Authority	<u>K.J. Anderson</u>	<u>1/27/98</u>

Justification: Lessons Learned on stabilizing fan from previous attempts.

Summary of Changes:

Added damper numbers to step 5.2.1.1. Deleted "After 45 min." and "with radial inlet damper" from step 5.2.1.2. Added substep 5.2.1.3 to allow further use/adjustment of radial inlet damper at Test Engineer's discretion.

HNF-2317

Rev 0

Page 1

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	OTP-320-001	A-3	1/27/98	1 of 40

TABLE OF CONTENTS

PAGE

1.0	PURPOSE AND SCOPE	3
1.1	PURPOSE	3
1.2	SCOPE	3
2.0	INFORMATION	4
2.1	TERMS AND DEFINITIONS	4
2.2	RESPONSIBILITIES	4
2.3	REFERENCES	6
2.4	GENERAL INFORMATION	6
2.5	RECORDS	9
3.0	PRECAUTIONS AND LIMITATIONS	10
3.1	RADIATION AND CONTAMINATION CONTROL	10
3.2	ENVIRONMENTAL COMPLIANCE	10
3.3	LIMITS	11
4.0	PREREQUISITES	15
4.1	SPECIAL TOOLS, EQUIPMENT, AND SUPPLIES	15
4.2	PERFORMANCE DOCUMENTS	15
4.3	CONDITIONS AND ACTIONS	15
5.0	PROCEDURE	18
5.1	INITIAL CONDITIONS	18
5.2	TEST ANNULUS FLOW	19
5.3	RESTORATION	26
5.4	SYSTEM RECOVERY PLAN	27
5.5	SYSTEM RESTART FROM SHORT TERM SHUTDOWN	28
	ATTACHMENT 1, OTP-320-001 TEST LOG	29
	ATTACHMENT 2, OTP-320-001 TEST EXCEPTION REPORT	30
	ATTACHMENT 3, OTP-320-001 SIGNATURE LOG	31
	ATTACHMENT 4, VENTILATION SYSTEM DATA SHEET	32
	ATTACHMENT 5, TEMPERATURE DATA SHEET	34
	FIGURE 1 - W-320 ANNULUS VENTILATION OTP TEST LOGIC	36
	FIGURE 2 - W-320 ANNULUS VENTILATION SYSTEM SCHEMATIC	37
	PROCEDURE HISTORY SIGNATURE SHEET	38

HNF-2317

Rev 0

Page 2

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	OTP 320-001	A-3	1/27/98	2 of 40

1.0 PURPOSE AND SCOPE

1.1 PURPOSE

This procedure provides instructions for Operational Testing of the W-320 Annulus Ventilation System to verify the system will perform adequately to ensure sufficient heat removal capacity in Tank 241-AY-102 after W-320 sluicing. Additionally, this test will demonstrate that ventilation system modifications have satisfactorily eliminated cross connections between the primary and annulus ventilation systems. Specifically, the intent of this testing is to measure and record annulus vacuum and flow parameters from startup to maximum vacuum (less than -19 inWG) as follows:

- vacuum will be increased and system data recorded in 0.5 inWG increments up to a system vacuum of 4 inWG,
- above 4 inWG, vacuum will be increased and system data recorded in 1 inWG increments,
- once system design operating flow velocity and configuration are established, temperature element and system operating data shall be recorded for 10 days,
- after 10 days of data acquisition, vacuum levels shall will be increased to maximum vacuum in 1 inWG increments.

1.2 SCOPE

This procedure involves all equipment and instrumentation specific to Tank AY-102 Annulus Ventilation.

Data recorded during testing will allow the following design functions to be verified:

- Annulus ventilation system performance.
- Annulus ventilation system boundary integrity.

Type	Document No.	Rev/Mod
CONTINUOUS	OTP-200-001	A-3

2.0 INFORMATION

2.1 TERMS AND DEFINITIONS

- 2.1.1 DST - Double Shell Tank
- 2.1.2 CAM - Continuous Air Monitor
- 2.1.3 FPM - Feet Per Minute
- 2.1.4 HEPA - High Efficiency Particulate Air

2.2 RESPONSIBILITIES

- 2.2.1 Joint Test Review Group - consisting of; Chief Test Director, Operations Test Director, W-320 Project Manager, DST Engineering Manager and the Design Authority:
 - Conducts thorough reviews of test procedures to ensure they can be done safely.
 - Conducts thorough reviews of test procedures to ensure compliance with applicable procedure requirements and adequately demonstrate accomplishment of test objectives.
 - Conducts thorough reviews of test plans to ensure the scope of testing and inspections provide a product that satisfies operational and safety requirements.
- 2.2.2 Craft (TWRS Maintenance and/or Construction Forces):
 - Provide assistance during OTP testing.
 - Provide equipment for the performance of this OTP.
- 2.2.3 Test Engineer:
 - Provide technical support during testing.
 - Provide programming support during testing.
 - Review test documents to validate acceptance.
 - Record equipment status and data per this procedure.
 - Record data exceptions and other notes as required on the OTP Data Sheets.
 - Prepare post testing documents.
- 2.2.4 Health Physics Technician
 - Operation and monitoring of CAM.

HNF-2317

Rev 0
Page 4

Type	Document No.	Rev/Mod.	R
CONTINUOUS	OTP 320-001	A-3	

2.2 RESPONSIBILITIES (Cont.)

2.2.5 Test Director:

- Overall control of the testing process and change record authorization for this OTP.
- Ensures all required data is collected.
- Safe and productive accomplishment of testing.
- Ensure safe working conditions and practices.
- Ensure compliance with test documents and Technical Safety Requirements/Documents (TSRs/OSDs) during testing.
- Communicate and coordinate testing with DST Shift Manager.
- Ensures review and approval of all modifications to test procedures are completed prior to return to testing.
- Act as a direct line of communication and centralized point of control during normal, abnormal, and casualty situations.
- Conduct pretest briefings as required.
- Schedule/reschedule tests as required.
- Conduct pre-job system walkdowns.
- Review test documents to validate acceptance.
- Verify all test instrumentation is within current calibration cycle.

2.2.6 Operations:

- Operate annulus test damper T-V-1.
- Operate and Monitor Annulus ventilation system.
- Monitor CAM radiation recorder.
- Record test data as required.

2.2.7 Quality Control Inspector:

- ~~• Verifies prerequisites complete prior to start of test.~~
- Review recorded test data for accuracy and completeness at completion of test.

PCA-575-98-081

Type	Document No.	Rev/Mod
CONTINUOUS	OTP-320-001	A-3

HNF-2317
Rev 0
Page 5

2.3 REFERENCES

- 2.3.1 H-2-64462, Sht 1, "Ventilation Equipment Schedules & Control Diagram"
- 2.3.2 TO-060-121, "Operate TK-241-AY-102 Annulus Ventilation System."
- 2.3.3 ECN 645848L, "Tank 241-AY-102 Annulus Ventilation Test."
- 2.3.4 ECN 645839, "Tank AY-102 Annulus Instm Upgrades."
- 2.3.5 ECN 611046, "241-AY-102, K2-4-1 Heater Housing Fabrication."

2.4 GENERAL INFORMATION

2.4.1 CHANGE CONTROL

- 2.4.1.1 Change control shall be in accordance with HNF-IP-0842.
- 2.4.1.2 The Joint Test Review Group shall concur with all changes, except editorial to this procedure. Concurrence shall be documented in the test log.

2.4.2 EXCEPTIONS

- 2.4.2.1 Test exceptions are used to document unexpected results and identify appropriate actions, not to circumvent performance requirements.
- 2.4.2.2 All test exceptions shall be given a sequential number and recorded on Attachment 1, OTP-320-001 TEST LOG.
- 2.4.2.3 Attachment 2, OTP-320-001 TEST EXCEPTION REPORT, shall be filled out to record and disposition each test exception.

Type	Document No.	Rev/Mod	Relas
CONTINUOUS	OTP-320-001	A-3	

HNF-2317
Rev 0
Page 6

2.4 GENERAL INFORMATION (Cont.)

2.4.3 ALARM RESPONSE

- 2.4.3.1 This procedure identifies all alarms expected as a result of testing and provides instructions for responding to those alarms.
- 2.4.3.2 Existing alarm response procedures shall be used when responding to unexpected alarms which occur during testing.
- 2.4.3.3 Unexpected alarms received during testing shall be logged as test exceptions and evaluated by the Test Director for effect on the test.

2.4.4 The flow velocity shall not be allowed to go below 700 FPM during performance of this procedure, except during test steps 5.2.31 through 5.2.40.

2.4.5 Contact Test Director and Test Engineer for additional instructions if changing plant conditions affect testing or delays extend test duration past end of the (testing) shift.

2.4.6 If during performance of this procedure, any of the following conditions are found, **IMMEDIATELY** notify the assigned Test Director and Test Engineer:

- Any equipment malfunction which could prevent fulfillment of functional requirements.
- Personnel error or procedural inadequacy which could prevent fulfillment of procedural requirements.
- Any other unexpected anomalies.

Test Director shall assess the effect on the plant and the test and direct either continuation of the test in the same section, proceeding to another attachment or section of the test, or suspension of the test per step 2.4.12 and establishing a safe condition for equipment.

2.4.7 Comply with the Hanford Site Wide Lock and Tag policy requirements, HNF-IP-0842, Vol. II, Section 4.9.1.

PCA-372-28-081

2.4 GENERAL INFORMATION (Cont.)

- 2.4.8 If at anytime during test PI-102-AY exceeds -19 inWG:
- Notify Test Director and Test Engineer.
 - Test Director and Test Engineer shall assess current ventilation system configuration.
 - Test Director shall direct either continued testing, or suspension of test and proceeding to Section 5.3, "RESTORATION".
- 2.4.9 All Measuring and Test Equipment (M&TE) used during performance of this procedure to collect qualitative data, with the exception of "timing devices", shall meet the following requirements:
- Be within its current calibration cycle as evidenced by an affixed calibration label.
 - Be capable of the desired range.
 - Have an accuracy (consistent with state-of-the-art limitations) equal to or greater than the accuracy specified in the procedure.
- 2.4.10 Timing measurements shall be made with commercially available timing devices.
- 2.4.11 SYSTEM STATUS
- 2.4.11.1 Record all changes in equipment configuration, system pressures and flows, comments and observations by participants, and all other data pertinent to the test on Attachment 1, OTP-320-001 TEST LOG.
- 2.4.11.2 Operations shall complete all normal ROUNDS DATA SHEETS (not part of this procedure) throughout performance of this procedure.

Type	Document No.	Rev/Mod	P
CONTINUOUS	OTP-320-001	A-3	

2.4 GENERAL INFORMATION (Cont.)

2.4.12 SUSPENSION OF TEST AND RESUMING TEST

- 2.4.12.1 Test Director may unilaterally, for any reason, stop testing, and shut down the ventilation system in accordance with TO-060-121, "Operate TK-241-AY-102 Annulus Ventilation System." All suspension of testing shall be documented on Attachment 1, OTP-320-001 TEST LOG.
- 2.4.12.2 The Joint Test Review Group shall be notified of unplanned test stoppage and shall concur with resumption of testing. Concurrence shall be documented on Attachment 1, OTP-320-001 TEST LOG.
- 2.4.12.3 If a section of the test is suspended for any reason prior to completing all steps, the Test Director shall establish initial conditions necessary to resume testing for that section. Previously completed sections need not be repeated unless directed by the Test Director to establish conditions required to resume the test.

2.5 RECORDS

- 2.5.1 The performance copy of the OTP and all completed attachments shall be filed as a permanent test record (Operational Test Report).

Type	Document No.	Rev/Mod	IS
CONTINUOUS	OTP-320-001	A-3	

3.0 PRECAUTIONS AND LIMITATIONS

3.1 RADIATION AND CONTAMINATION CONTROL

3.1.1 CAM 102-AY shall be monitored continuously during changes to annulus ventilation system flow and vacuum levels, and for 60 minutes after changes have been completed.

3.1.1.1 Past experience shows that when the annulus ventilation system has been shut down for an extended period of time, high levels of radon gas accumulate in the annulus. These radon levels result in high activity readings on the CAM at startup, and may persist for several days before CAM levels normalize below 450 CPM. HPT support must be obtained to verify high CAM readings are the result of radon.

NOTE - Approval process must be started in time to ensure approval for continued operation is "in-hand" at 48 hours.

3.1.1.2 IF CAM alarms within 48 hours of startup, THEN approval for continued operation must be obtained from Joint Test Review Group.

3.1.1.3 If at anytime during testing (except system start-up when high radon levels are anticipated) should CAM alarm, then testing shall be stopped IMMEDIATELY, and the Test Director notified.

3.2 ENVIRONMENTAL COMPLIANCE

3.2.1 Tank Farm ventilation systems and exhaust monitoring systems are regulated under Washington State Administrative Code (WAC) Chapters 173-400, 173-401, 173-460 and 246-247 and applicable Notices of Construction (NOC) issued to ensure compliance with these regulations. To ensure reporting requirements are met, all planned and unplanned outages of Tank Farm ventilation and exhaust monitoring systems, including portable exhausters, must be immediately reported to Environmental Operations Compliance (EOC). EOC shall determine and make the required notifications pertaining to ventilation system outages.

3.3 LIMITS

HNF-SD-WM-TSR-006, Rev 0-D, Tank Waste Remediation System Technical Safety Requirements.

- BIO-TSR-LCO 3.2.6 One of the two primary leak detection systems listed below shall be OPERABLE:

The annulus conductivity probe system

OR

The annulus continuous air monitor (CAM) system

Mode Applicability: Operation and Limited.

Process Area Applicability: DSTs and AWF tanks

- BIO-TSR-LCO 3.3.3 Tank 241-AY-102 annulus ventilation system shall be OPERABLE.

Mode Applicability: Operation and Limited.

Process Area Applicability: Tank 241-AY-102 after ≥ 2 ft of sludge from the Tank 241-C-106 has been transferred to the Tank 241-AY-102.

- BIO-TSR-AC 5.18 HEPA Filter Controls:

BIO-TSR-AC 5.18.2.a: Program Key Elements

VERIFY periodically that the HEPA and HEGA (for AWF) filter and prefilter housing radiation level is ≤ 200 mrem/h on contact. Replace the HEPA and HEGA (for AWF) filters and prefilters before filter housing radiation levels exceed 200 mrem/h.

Type	Document No.	Rev/Mod	Rd
CONTINUOUS	OTP-320-001	A-3	

HNF-2317
Rev 0
Page 11

3.3 LIMITS (Cont.)

- BIO-TSR-AC 5.19 Process Instrumentation and Measuring and Test Equipment

BIO-TSR-AC 5.19.2 Program Key Elements

Identification and traceability of TSR-related instrumentation and equipment shall be maintained.

Instrumentation and equipment shall either have a FUNCTIONAL TEST or CALIBRATION as applicable at appropriate intervals to VERIFY required performance.

Records shall be maintained to provide evidence that the instrumentation and equipment are within the FUNCTIONAL TEST or CALIBRATION when used.

- BIO-TSR-AC 5.25 Ventilation Controls

BIO-TSR-AC 5.25.2 Program Key Elements

Perform an external visual inspection of the above-ground recirculation ventilation ductwork for Tank 241-C-106 to identify any obvious visual damage every 24 hours during operation of recirculation fan FN 1361. The recirculation ventilation ductwork for Tank 241-C-106 includes the ductwork within Process Building 241-C-91, the inlet duct, and return duct to the tank. Monitor and evaluate ventilation flow data during operation of FN 1361 to determine if any recirculation losses are occurring.

Periodically determine the cooling capacity required for Tank 241-AY-102 ventilation system to maintain WASTE temperatures in accordance with the requirements of LCS/LCO 3.3.2. This determination shall be based on a heat balance developed from the tank WASTE temperature and liquid level; and ventilation parameters such as flow rate, temperature and humidity, as applicable, including planned activities that could impact the cooling requirements. Provide the necessary cooling capability before each campaign to transfer two feet of Tank 241-C-106 sludge to Tank 241-AY-102.

Type	Document No.	Rev/Mod	R
CONTINUOUS	OTP-320-001	A-3	

3.3 LIMITS (Cont.)

- OSD-T-151-00007.2.2 LIQUID LEVELS: Specification Limit

<u>Variable</u>	<u>Tanks</u>	<u>Specification Limit</u>
a. Primary Tank Liquid Level***	AN, AP, AW and SY	Min: 6 in.**
	AY, AZ	Min: 64 in.*

* When the annulus ventilation system is operating. When the annulus ventilation system is not operating, the absolute minimum liquid level required is that level necessary to meet the hydrostatic head limitation discussed in OSD-T-151-00017 Para. 17.2.1.1.

** The ventilation system shall not be operated unless the liquid level is 6 in.

*** Liquid level is defined as the surface level irrespective of the amounts of sludge, supernate or solids/crust.
- OSD-T-151-00016.3.1 ANNULUS VENTILATION: Specification Limit
The Annulus Ventilation System shall not be operated when the primary tank liquid level is less than 64 inches.
- OSD-T-151-00016.3.2.1 HEPA FILTRATION: Specification Limit
Exhausts shall pass through two stages of HEPA filters (when the ventilation system is operating).
- OSD-T-151-00016.3.2.2 PRESSURE DROP ACROSS HEPA FILTERS: Specification Limit
Pressure drop across first filter in a series ≤ 5.9 inWG.
Pressure drop across any other filter ≤ 4.0 inWG.
Total pressure drop across filters in a series ≤ 5.9 inWG.
- OSD-T-151-00016.3.2.3 PARTICULATE REMOVAL: Specification Limit
 $\geq 99.95\%$ of particles between 0.3um and 5.0um, and of average size 0.5um.

3.3 LIMITS (Cont.)

- OSD-T-151-00016.3.3

<u>Variable</u>	<u>Specification Limit</u>
A. Discharges - average concentration of any constituent over a 12 month period.	The annual average concentration of radionuclides released to the environment shall not exceed the Administrative Control Value (ACV) of 1 times the Derived Concentration Guides (DCG) value specified in Appendix C of WHC-CM-7-5.
B. Sampling Systems	Exhaust gases shall be sampled continuously for particulate activity.
C. Monitoring Systems	Exhaust gases shall be monitored continuously for gross beta/gamma activity.
D. Alarm Systems	Visible and audible alarms shall be provided, set to concentration levels less than four times the ACV stated in WHC-CM-7-5.

4.0 PREREQUISITES

4.1 SPECIAL TOOLS, EQUIPMENT, AND SUPPLIES

The following supplies may be needed to perform this procedure:

- Means of communication between control room and equipment locations (i.e. radios/cell phones).
- Thermometer or temperature indicator for measuring ambient temperature at tank farm testing location.

4.2 PERFORMANCE DOCUMENTS

The following procedures may be needed to perform this procedure:

- TO-060-121, "Operate TK-241-AY-102 Annulus Ventilation System."
- ARP-T-211-00001, "Respond To Panel 3 Alarms At 271-A Control Building"

4.3 CONDITIONS AND ACTIONS

NOTE: Steps 4.3.1 through 4.3.14 may be performed in any order.

4.3.1 CONDUCT a pretest briefing for all personnel involved in the performance of this OTP.

- A daily pre-job briefing shall be performed by the Test Director and documented in Attachment 1, OTP-320-001 TEST LOG.

TEST DIRECTOR INITIALS/DATE: Ja / 2/10/98

NOTE: LCO 3.2.6 requires only one of two primary leak detection systems be operable. For the performance of this test, the functional testing identified in Step 4.3.2 must demonstrate BOTH conductivity probe system and CAM are operational.

4.3.2 ENSURE annulus leak detection functional testing (TF-FT-259-008) has been performed within the previous 150 days.

TEST DIRECTOR INITIALS/DATE: Ja / 2/10/98

4.3.3 ENSURE annulus exhaust CAM sample collection paper has been replaced within the last seven days.

TEST DIRECTOR INITIALS/DATE: Ja / 2/10/98

Type	Document No.	Rev/Mod	Re
CONTINUOUS	OTP-320-001	A-3	

HNF-2317
Rev 0
Page 15

4.3 CONDITIONS AND ACTIONS (Cont.)

- 4.3.4 ENSURE annulus pump out pit 02F is isolated from primary vent space.

TEST DIRECTOR INITIALS/DATE: JA / 2/10/98

- 4.3.5 VERIFY HPT support availability AND NOTIFY HPT of need to verify high CAM readings anticipated at start up are the result of radon.

TEST DIRECTOR INITIALS/DATE: JA / 2/10/98

- 4.3.6 PERFORM a walkdown inspection of the TK-241-102-AY annulus ventilation systems tested by this OTP.

TEST DIRECTOR INITIALS/DATE: JA / 2/10/98

- 4.3.7 ESTABLISH communication between control room and equipment locations.

TEST DIRECTOR INITIALS/DATE: JA / 2/10/98

- 4.3.8 ENSURE the official OTP copy and all other photocopies to be used during testing are the latest approved revision.

TEST DIRECTOR INITIALS/DATE: JA / 2/10/98

- 4.3.9 REVIEW LOCK & TAG LOGBOOK to verify all components are available for the test.

TEST DIRECTOR INITIALS/DATE: JA / 2/10/98

- NOTE - Signature Log requirement is ongoing as new individuals become involved in the procedure.

- 4.3.10 ENSURE all personnel to be involved with performance of this procedure have completed Attachment 3, OTP-320-001 SIGNATURE LOG.

TEST DIRECTOR INITIALS/DATE: JA / 2/10/98

- 4.3.11 ENSURE installed instrumentation listed as requiring calibration on Attachment 4, Ventilation System Data Sheet is within current calibration cycle with calibration stickers affixed.

TEST DIRECTOR INITIALS/DATE: JA / 2/10/98

4.3 CONDITIONS AND ACTIONS (Cont.)

- 4.3.12 ENSURE Environmental Compliance Officer notified of startup of TK-241-AY-102 Annulus Ventilation System.

TEST DIRECTOR INITIALS/DATE: Ja / 2/10/98

*System
already
running*

- 4.3.13 ENSURE annulus test damper T-V-1 is installed in riser location 19B.

TEST DIRECTOR INITIALS/DATE: Ja / 2/10/98

- 4.3.14 ENSURE all TK-241-102-AY pit covers are in place:

- 02A
- 02B
- 02C
- 02D
- 02E
- 02F

TEST DIRECTOR INITIALS/DATE: Ja / 2/10/98

- 4.3.15 VERIFY Project W-030 operating conditions are compatible with operations conducted under OTP-320-001.

TEST DIRECTOR INITIALS/DATE: Ja / 2/10/98

PCA-ETC-98-081

5.0 PROCEDURE

- Note - Figure 1 and Figure 2 provide graphical representation of the test logic and a system schematic.
- Note - Attachment 4, VENTILATION SYSTEM DATA SHEET, and Attachment 5, TEMPERATURE DATA SHEET may be reproduced as required.
- Note - 271-A Alarm Panel 3, Alarm 8-3 "102-AY Annulus Vent System Failure" and CASS Alarm 1167 are expected to alarm repeatedly throughout this procedure and may be ignored.

5.1 INITIAL CONDITIONS

- 5.1.1 POSITION annulus test damper T-V-1 to FULL OPEN.
- 5.1.2 START annulus ventilation system per T0-60-121.
- 5.1.3 LOCK Ventilation Storm damper (K2-MK-6301) to FULL OPEN.
- 5.1.4 RESET Fan Inlet Control damper (MK-6302) to FULL OPEN.
- 5.1.5 ALLOW system to operate for 60 minutes.
- 5.1.6 RECORD data per Attachment 4, VENTILATION SYSTEM DATA SHEET.
- 5.1.7 RECORD data per Attachment 5, TEMPERATURE DATA SHEET.

5.2 TEST ANNULUS FLOW

CAUTION

Operating annulus exhaust fan in an unstable condition for an extended period of time will damage the fan.

NOTE - Constant fluctuation in output flowrate of ± 100 FPM (FI-K2-1-1) when no other changes (ie. damper positioning) have been made to the ventilation system, or failure of the fan to stabilize after changes have been made are indication that the fan is operating in an unstable condition.

5.2.1 IF at any time, annulus fan begins to operate in an unstable condition:

5.2.1.1 **ADJUST** radial inlet dampers, MK-6302 and K2-MK-6501 as directed by Test Engineer.

5.2.1.2 IF fan can NOT be stabilized with radial inlet damper, **THEN SLOWLY OPEN** annulus test damper T-V-1 until fan stabilizes, **AND NOTIFY** Test Director.

5.2.1.3 **REPEAT** steps 5.2.1.1 and 5.2.1.2 at discretion of Test Engineer, **THEN PROCEED**.

5.2.2 IF at any time, annulus vacuum (PI-102-AY) exceeds -19 inWG, **THEN STOP** testing, **AND NOTIFY** Test Director.

5.2.3 **MONITOR** TK-241-102-AY vacuum (PR-102-1) continuously during changes to annulus ventilation system flow and vacuum levels, and for 60 minutes after changes have been completed.

5.2.3.1 IF at any time, TK-241-102-AY vacuum (PR-102-1) increases by more than 0.5 inWG from initial value, **THEN STOP** all changes to the system immediately, **AND NOTIFY** Test Director.

5.2.3.2 Test Director: **EVALUATE AND DETERMINE** cause of change.

A. IF change is due to change in primary system configuration, **THEN RECORD** new primary tank vacuum on Attachment 4 **AND CONTINUE** testing.

B. IF reason for change is unclear, **THEN GO TO** Section 5.3, "RESTORATION", OR Section 5.4, "SYSTEM RECOVERY PLAN" per Test Director Instructions.

HNF-2317

Rev 0

Page 19

Type	Document No.	Rev/Mod	R
CONTINUOUS	OTP-320-001	A 3	

5.2 TEST ANNULUS FLOW (Cont.)

5.2.4 **MONITOR** CAM 102-AY continuously during changes to annulus ventilation system flow and vacuum levels, and for 60 minutes after changes have been completed.

NOTE - High CAM levels at startup after an extended shutdown, may be the result of radon buildup in the annulus. Approval process must be started in time to ensure approval for continued operation is "in-hand" at 48 hours.

5.2.5 **IF** CAM alarms within 48 hours of startup,
THEN:

5.2.5.1 **OBTAIN** approval from Joint Test Review Group for continued operation.

5.2.5.2 **PERFORM** Steps 5.2.6.3 through 5.2.6.6

5.2.6 **IF** at anytime (except during system start-up) CAM alarms,
THEN:

5.2.6.1 **STOP** testing,

5.2.6.2 **NOTIFY** Test Director,

5.2.6.3 **HPT: COLLECT** (replace) filter paper **AND INITIATE** establishment of characteristic decay curve per HNF-PRO-332, "Radon" to determine if Radon is sole source of elevated CAM level.

NOTE - If CAM alarm occurs during annulus startup, DST Shift Manager or Test Director may elect continued testing pending evaluation of filter paper.

5.2.6.4 **HPT: CONTACT** DST Shift Manager and Radiological Control First Line Manager concerning radon evaluation and CAM setpoint adjustment.

5.2.6.5 **IF** HPT determines CAM alarm is from other than Radon, **THEN** Radiological Control First Line Manager shall **NOTIFY** Test Director, Environmental Compliance Officer and Radiological Control Manager.

5.2.6.6 Test Director: **DETERMINE AND DIRECT** appropriate response to non-radon high CAM reading.

5.2 TEST ANNULUS FLOW (Cont.)

- 5.2.6.7 HPT: based on evaluation of filter paper,
ADJUST CAM setpoint per HNF-PRO-332.
- 5.2.6.8 IF CAM setpoint is elevated above normal,
THEN HPT shall evaluate filter paper every four hours per
decay curve method in HNF-PRO-332, AND ADJUST setpoint
until returned to normal.
- 5.2.7 IF annulus vacuum (PI-102-AY) is greater than or equal to 4 inWG
vacuum,
THEN GO TO Step 5.2.16
- 5.2.8 SLOWLY CLOSE annulus test damper T-V-1 until one of the
following occurs,
THEN PROCEED as indicated for the applicable condition:
- IF ventilation flow velocity decreases to 700 FPM,
THEN GO TO Step 5.2.12.
 - IF annulus vacuum (PI-102-AY) increases by 0.5 inWG from
the last recorded value on data sheet,
THEN GO TO Step 5.2.9.
- 5.2.9 ALLOW system to operate for 30 minutes,
THEN RECORD data per Attachment 4, VENTILATION SYSTEM
DATA SHEET.
- 5.2.10 ALLOW system to operate an additional 30 minutes,
THEN RECORD data per Attachment 4, VENTILATION SYSTEM
DATA SHEET.
- 5.2.11 REPEAT Step 5.2.7 through 5.2.10 as applicable.
- 5.2.12 SLOWLY OPEN flow control damper (K2-MK-6501) until one of the
following occurs,
THEN PROCEED as indicated for the applicable condition:
- IF flow (FI-K2-1-1) is reestablished at 900 to 1100 FPM,
THEN GO TO Step 5.2.7.
 - IF annulus vacuum (PI-102-AY) increases by 0.5 inWG from
the last recorded value,
THEN GO TO Step 5.2.13.
- 5.2.13 ALLOW system to operate for 30 minutes,
THEN RECORD data per Attachment 4, VENTILATION SYSTEM
DATA SHEET.

HNF-2317

Rev 0

Page 21

Type	Document No.	Rev/Mod	R
CONTINUOUS	OTP-320-001	A-3	

5.2 TEST ANNULUS FLOW (Cont.)

- 5.2.14 ALLOW system to operate an additional 30 minutes,
THEN RECORD data per Attachment 4, VENTILATION SYSTEM
DATA SHEET.
- 5.2.15 REPEAT Steps 5.2.12 through 5.2.14 as applicable.
- 5.2.16 SLOWLY CLOSE annulus test damper T-V-1 until one of the
following occurs,
THEN PROCEED as indicated for the applicable condition:
- IF ventilation flow velocity decreases to 700 FPM,
THEN GO TO Step 5.2.20.
 - IF annulus vacuum (PI-102-AY) increases by 1 inWG from the
last recorded value on data sheet,
THEN GO TO Step 5.2.17.
 - IF annulus test damper FULLY CLOSES,
THEN GO TO Step 5.2.24.
- 5.2.17 ALLOW system to operate for 30 minutes,
THEN RECORD data per Attachment 4, VENTILATION SYSTEM
DATA SHEET.
- 5.2.18 ALLOW system to operate an additional 30 minutes,
THEN RECORD data per Attachment 4, VENTILATION SYSTEM
DATA SHEET.
- 5.2.19 REPEAT Step 5.2.16 through 5.2.18 as applicable.
- 5.2.20 SLOWLY OPEN flow control damper (K2-MK-6501) until one of the
following occurs,
THEN PROCEED as indicated for the applicable condition:
- IF flow (FI-K2-1-1) is reestablished at 900 to 1100 FPM,
THEN GO TO Step 5.2.16.
 - IF annulus vacuum (PI-102-AY) increases by 1 inWG from the
last recorded value,
THEN GO TO Step 5.2.21.
- 5.2.21 ALLOW system to operate for 30 minutes,
THEN RECORD data per Attachment 4, VENTILATION SYSTEM DATA
SHEET.
- 5.2.22 ALLOW system to operate an additional 30 minutes,
THEN RECORD data per Attachment 4, VENTILATION SYSTEM DATA
SHEET.

5.2 TEST ANNULUS FLOW (Cont.)

- 5.2.23 REPEAT Steps 5.2.20 through 5.2.22 as applicable.
- 5.2.24 SLOWLY OPEN flow control damper (K2-MK-6501) until one of the following occurs,
THEN PROCEED as indicated for the applicable condition:
- IF flow (FI-K2-1-1) is reestablished at 900 to 1100 FPM,
THEN GO TO Step 5.2.29.
 - IF annulus vacuum (PI-102-AY) increases by 1 inWG from the last recorded value,
THEN GO TO Step 5.2.25.
- 5.2.25 ALLOW system to operate for 30 minutes,
THEN RECORD data per Attachment 4, VENTILATION SYSTEM DATA SHEET.
- 5.2.26 ALLOW system to operate an additional 30 minutes,
THEN RECORD data per Attachment 4, VENTILATION SYSTEM DATA SHEET.
- 5.2.27 REPEAT Steps 5.2.24 through 5.2.26 as applicable.
- 5.2.28 ALLOW system to operate for 30 minutes,
THEN RECORD data per Attachment 4, OTP-320-001, VENTILATION SYSTEM DATA SHEET, and Attachment 5, TEMPERATURE DATA SHEET every three hours.
- 5.2.29 ALLOW system to operate an additional 30 minutes,
THEN RECORD data per Attachment 4, OTP-320-001, VENTILATION SYSTEM DATA SHEET, and Attachment 5, TEMPERATURE DATA SHEET every three hours.
- NOTE - 240 hr time period in step 5.2.30 may be modified (up or down) as deemed necessary by DST Engineering or Test Director.
- 5.2.30 ALLOW system to operate for 240 hours (10 days) AND RECORD data per Attachment 4, OTP-320-001, VENTILATION SYSTEM DATA SHEET, and Attachment 5, TEMPERATURE DATA SHEET every three hours.

5.2 TEST ANNULUS FLOW (Cont.)

5.2.31 CLOSE damper (MK-6302) until one of the following occurs,
THEN PROCEED as indicated for the applicable condition:

- ~~IF flow velocity (FI K2 1 1) decreases to 700 FPM,
THEN GO TO Step 5.2.32.~~
- IF annulus vacuum (PI-102-AY) increases by 1 inWG from the last recorded value,
THEN GO TO Step 5.2.35.
- IF pressure control damper (MK-6302) is FULLY CLOSED,
THEN GO TO Step 5.2.37.

5.2.32 ~~OPEN damper K2-MK-6501 until one of the following occurs,
THEN PROCEED as indicated for the applicable condition:~~

- ~~IF flow (FI K2 1 1) is reestablished at 900 to 1100 FPM,
THEN REPEAT Step 5.2.31.~~
- ~~IF annulus vacuum (PI-102-AY) increases by 1 inWG from the last recorded value,
THEN GO TO Step 5.2.33.~~
- ~~IF flow control damper (K2-MK-6501) is FULLY OPEN,
THEN GO TO Step 5.2.37.~~

5.2.33 ~~ALLOW system to operate for 30 minutes,
THEN RECORD data per Attachment 4, VENTILATION SYSTEM
DATA SHEET.~~

5.2.34 ~~ALLOW system to operate an additional 30 minutes,
THEN RECORD data per Attachment 4, VENTILATION SYSTEM
DATA SHEET, AND REPEAT Step 5.2.32.~~

5.2.35 ALLOW system to operate for 30 minutes,
THEN RECORD data per Attachment 4, VENTILATION SYSTEM
DATA SHEET.

5.2.36 ALLOW system to operate an additional 30 minutes,
THEN RECORD data per Attachment 4, VENTILATION SYSTEM
DATA SHEET, AND GO TO Step 5.2.31.

5.2.37 ~~ALLOW system to operate for 30 minutes,
THEN RECORD data per Attachment 4, VENTILATION SYSTEM DATA
SHEET.~~

5.2.37 OPEN damper (K2-MK-6501) until one of the following occurs,
THEN PROCEED as indicated for the applicable condition:

- IF annulus vacuum (PI-102-AY) increases by 1 inWG from the last recorded value,
THEN GO TO Step 5.2.38.
- IF flow control damper (K2-MK-6501) is FULLY OPEN,
THEN GO TO Step 5.2.40.

5.2 TEST ANNULUS FLOW (Cont.)

5.2.38 ALLOW system to operate 30 minutes,
THEN RECORD data per Attachment 4, VENTILATION SYSTEM
DATA SHEET.

5.2.39 ALLOW system to operate an additional 30 minutes,
THEN RECORD data per Attachment 4, VENTILATION SYSTEM
DATA SHEET, AND REPEAT Step 5.2.37.

5.2.40 ALLOW system to operate an additional for 30 minutes,
THEN:

5.2.40.1 RECORD data per Attachment 4, VENTILATION SYSTEM
DATA SHEET.

5.2.40.2 RECORD position of dampers K2-MK-6501 & MK-6302 on
Attachment 1.

5.3 RESTORATION

- 5.3.1 ENSURE K2-MK-6501 is FULL CLOSED.
- 5.3.2 ENSURE MK-6302 is FULL OPEN.
- 5.3.3 ENSURE annulus test damper T-V-1 is FULL CLOSED.
- 5.3.4 SHUT down TK-241-AY-102 Annulus Ventilation system per TO-060-121.
- 5.3.5 ENSURE MK-6302 is FULL CLOSED.
- 5.3.6 QC: VERIFY all data sheets are complete and initialed.

QC SIGNATURE/DATE:

J. L. [Signature] 12-11-88

- 5.3.7 FORWARD completed test package including all data sheets and other attachments to Test Engineer and DST Shift Manager.

5.4 SYSTEM RECOVERY PLAN

- 5.4.1 IF CAM has alarmed,
THEN respond per ARP-T-211-00001, "RESPOND TO PANEL 3 ALARMS AT
271-A CONTROL BUILDING"
- 5.4.2 OPEN annulus test damper T-V-1.
- 5.4.3 ENSURE K2-MK-6301 and MK-6302 are OPEN.
- 5.4.4 POSITION K2-MK-6501 so flow velocity is 900 to 1100 FPM.
- 5.4.5 IF system is to be shutdown,
THEN
 - 5.4.5.1 OPERATE annulus ventilation system for 2-1/2 hrs:
 - 5.4.5.2 GO TO Section 5.3, RESTORATION.
- 5.4.6 IF test is to be continued,
THEN:
 - 5.4.6.1 OBTAIN Joint Test Review Group permission to continue.
 - 5.4.6.2 SLOWLY CLOSE annulus test damper T-V-1 until annulus vacuum
(PI-102-AY) increases by 1 inWG.
 - 5.4.6.3 POSITION K2-MK-6501 for flow velocity of 900 to 1100 FPM.
 - 5.4.6.4 ALLOW system to stabilize for five minutes.
 - 5.4.6.5 REPEAT Steps 5.4.6.2 through 5.4.6.4 until vacuum reaches
last value recorded on Attachment 4, Ventilation System
Data Sheet (prior to stopping test).
 - 5.4.6.6 GO TO Step 5.2.7.

5.5 SYSTEM RESTART FROM SHORT TERM SHUTDOWN

NOTE - IF system has been shutdown for less than 96 hrs, THEN RESTART may be performed per this section.

- 5.5.1 OBTAIN Joint Test Review Group permission to continue.
- 5.5.2 ENSURE conditions and actions are met per Section 4.3.
- 5.5.3 SET initial conditions per Section 5.1.
- 5.5.4 SLOWLY CLOSE annulus test damper T-V-1 until annulus vacuum (PI-102-AY) increases by 1 inWG.
- 5.5.5 POSITION K2-MK-6501 for flow velocity of 900 to 1100 FPM.
- 5.5.6 ALLOW system to stabilize for five minutes.
- 5.5.7 REPEAT Steps 5.5.4 through 5.5.6 until vacuum reaches last value recorded on Attachment 4, Ventilation System Data Sheet (prior to stopping test).
- 5.5.8 GO TO Step 5.2.7.

ATTACHMENT 1, OTP-320-001 TEST LOG

OTP-320-001		Page: <u>1</u> of <u>5</u>
TIME/DATE	DESCRIPTION	
0820 1/11/99	Completed gas size for OTP-320-001 <i>known</i>	
0845 1/11/99	Started Unit Handing Fan	
0850 1/11/99	VENTILATION SYSTEM STARTED STEAM DRAIN + FAN CONTROL DAMPER	
—	Worked over	
0852	THE FOLLOWING THERMOCOUPLES ARE OUT OF SERVICE 68, 72, 19, 42, 44, 71	
—	+54 CONTINUOUS TESTING	
0950	RAISED VAC - -3.0" PR. 102.1 -2.0"	
1005	ADJUSTED VACUUM TO -3.5"	
1113	RAISED VACUUM TO -4"	
1221	RAISED VACUUM TO -4.5"	
1330	ADJUSTED VACUUM TO -5.25"	
1439	ADJUSTED VACUUM TO -6.5"	
1539	CAM INCREASED TO 450 CPM WAITING TO SEE	
—	WHERE IT GOES	
1630	REQUESTED SHIFT SEND OPERATORS TO OTHER ANNULUS	
—	to see if they experienced similar trends	
1650	SHIFT OFFICE REPORTS NO INCREASE ON OTHER CAMS	
—	102-127 CAM AT 400 CPM Adjusting vacuum	
1710	Adjusted vacuum to 7.5" HAD TO ADJUST FLOW	
—	NEXT vacuum adjustment will be with K2-MK-6501	
—	Step 5.2.18	
1810	Adjusted Vacuum to -8.5" by adjusting MK-6501	
1840	CAM is reading 550 cpm, Suspect Radon.	
—	Commencing System recovery Section 5.4	
1845	T-V-1 is fully open, flow is adjusted to 1050.	

HNF-2317

Rev 0
Page 29

Type	Document No.	Rev/Mod
CONTINUOUS	OTP-320-001	A-0

ATTACHMENT 1, OTP-320-001 TEST LOG

OTP-320-001		Page: <u>2</u> of <u>3</u>
TIME/DATE	DESCRIPTION	
1845/1/21/98	System will now operate for 2.5 hours.	
2115/1/21/98	Obtained JTRG Approval to increase CAM limit to 1000 cpm. Will slowly increase Vacuum back to -8.5" and Resume test.	
2255/1/21/98	Vacuum restored to -8.5", flow is at 700 fpm. CAM is reading 30 cpm. Test is reinitiated. Will resume taking data.	
2355/1/21/98	102-AP CAM increased to 400 cpm and then slowly decreased to 250 cpm. Adjusted Vacuum to -9.5". Tank pressure increased from -2.0" to -2.1". Watching tank Vacuums closely.	
0055/1/22/98	Adjusted Vacuum to -10.5", flow 825 fpm. CAM is reading 400 cpm.	
0215/1/22/98	Attempted to adjust flow to 950 to 1000 fpm.	
0455/1/22/98	Unable to achieve flow. MK-6501 is full open, T-V-1 is roughly 95% closed. Even with T-V-1 fully closed, system will be unable to pull the required flow. Test to determine flow is essentially complete. Will continue with step 5.2.26, which starts the 3 hour data taking process. Vacuum is -11.0", flow is 800 fpm and the CAM is reading 400 cpm.	
		1-22-98

HNF-2317

Rev 0

Page 30

Type	Document No.	Rev/Mod	Re
CONTINUOUS	OTP-320-001	A-0	

ATTACHMENT 1, OTP-320-001 TEST LOG

OTP-320-001		Page: <u>3</u> of <u>3</u>
TIME/DATE	DESCRIPTION	
0630 1/22/98	102 AT PRIMARY VACUUM INCREASED TO -3.5" DUE TO PRESSURE	
	FAC PULLED TAP ON 102 AT VACUUM AT -2.5" (AM 3000CM)	
1601	SHUT DOWN EXHAUSTER THE P114 IS TO CHANGE	
	THE SITHOUS AND RESTART TEST WITH A BINDER	
	TEMPERATURE DATA WAS MISSED AT 930 1131 1430	
	TOOK TEMPERATURES AT 1530.

ATTACHMENT 1, OTP-320-001 TEST LOG

OTP-320-001		Page: 1 of 2
TIME/DATE	DESCRIPTION	
1500 1/23/98	STRON APPROX RESTART OF OTP AFTER FAN SHOWER REPLACEMENT	
1910 1/23/98	COMPLETED PRE JOB FOR FAN START AND OTP RESTART	
1930 1/23/98	STARTED 102 AT APPROX 2.145 PM	
1952 1/23/98	ESTABLISHED INITIAL TEST CONDITIONS	
2124 1/23/98	COMPLETED INITIAL DATA ATTACHMENTS 445 PB-102-1 -2.1" PI TOC AT -3.5" TE 68, 71, 72, 18, 42, 44, 54 O/S	
2133 1/23/98	RAISED VACUUM TO -4.5"	
2142 1/23/98	RAISED VACUUM TO -5.5"	
2149 1/23/98	RAISED VACUUM TO -6.5"	
2156 1/23/98	RAISED VACUUM TO -7.5" ADJUSTED FLOW TO 1100 FPM	
2201 1/23/98	VACUUM SETTLED AT -10"	
2206 1/23/98	RAISED VACUUM TO -11"	
2220 1/23/98	RAISED VACUUM TO -12"	
2331 1/23/98	RAISED VACUUM TO -13"	
2345 1/23/98	COMPLETED PRE JOB FOR GRAVE YARD	
0038 1/24/98	T-V-1 IS SHUT VACUUM -13.1"	
0043 1/24/98	ADJUSTED FLOW TO 800 FPM RAISED VACUUM TO -14"	
0207 1/24/98	ADJUSTED FLOW TO 850 FPM RAISED VACUUM TO -15"	
0326 1/24/98	RAISED VACUUM TO -15.5" K2-MK-6501 IS FULLY OPENED FLOW ~ 900 FPM BUT D.P.W. TO 150 FPM	
0345 1/24/98	OPENED T-V-1 1/4 TURN ON THE VALVE ALONG FOR FLOW MORE STABLE AT 90 BUT OCCASIONALLY DIPS TO 750. DIPS OCCUR DURING SOME GUSTS OF WIND. WILL TAKE 30/60 MIN VENT DIRT AND THEN START 3 HOUR TEMPERATURE DATA	

ATTACHMENT 1, OTP-320-001 TEST LOG

OTP-320-001		Page: <u>2</u> of <u>2</u>
TIME/DATE	DESCRIPTION	
0515 1/24/98	SPOKE WITH M JENNINGS. HE DOES NOT THINK THERE IS ANY ADJUSTMENTS IN URGES, OTHER THAN T-V-1, THAT WILL HAVE FURTHER IMPACT ON FLOW. WILL CONTINUE TO RUN EXHAUSTER AND TAKE TEMPERATURE DATA TURNED OVER TO SHIFT MANAGER	
0630 1/24/98	Conducted pre-job with operator. Continuing 3 hour Vent & Temperature data.	
0745 1/24/98	Obtained Vent & Temp data. CAM reading are lowering. Now at 1750 Cpm.	
1615 1/24/98	CAM readings are continuing to drop. Now reading 1500 Cpm. Test Engineers are developing PCA to allow manipulation of fan inlet damper. Will attempt these changes on Monday.	
0630 1/26/98	CONTINUING TEST RECORDS TEMPERATURE AND VENT DATA THROUGH WEEKEND. COMPLETED SCHEDULE WITH OPERATION	
1145 1/26/98	RECEIVED STRG APPROVAL TO PCA OTD TO ALLOW ADJUSTMENT OF RADIAL INLET DAMPER TO TRY TO STABILIZE FLOW

OTP-320-001		Page: <u>2</u> of <u>2</u>
TIME/DATE	DESCRIPTION	
1620/2/10/96	Commenced final portion of test.	
1625/2/10/96	Shut MK-6502 fully. Vacuum is reading -16.4"	
1637/2/10/96	Opened MK-6501 fully. Vacuum is -16.5"	
1638/2/10/96	Valve positions are 6501 full open, 6502 is full closed.	
1707/2/10/96	Obtained 30 min data. Commenced System shutdown.	
1725	System is secured. Test Complete.	

OTP-320-001		Page: <u>1</u> of <u> </u>	
TEST PROCEDURE NO. & SECTION: OTB-320-001 ATTACH S	TEST NAME: W-360 Annular Ventilator SISTEM OPERATIONAL TEST	EXCEPTION TRACKING NUMBER: 001	
DESCRIPTION OF PROBLEM: Theracomples TE-102-AF - G8 -72 -19 -42 -44 -54 -71 N/A OUT OF SERVICE			
ORIGINATOR: K SANDERSON	ORG: 	IMPACT ON TESTING: ☐ HOLD FOR RESOLUTION ☒ CONTINUE	DATE: 1/21/98
DISPOSITION: CONTINUAL TEST, THERACOMPLES WT RTU001A20 RUN CONTINUATION OF TEST		TEST DIRECTOR: <i>[Signature]</i> DATE: 1-21-98	
DISPOSITION APPROVED BY: <i>Joseph M Jones</i> (01-23-98) TEST ENGINEER			
DISPOSITION AND RETEST REQUIREMENTS COMPLETED BY: N/A <i>JMJ</i> 01-23-98 DATE:	DISPOSITION ACTIONS COMPLETE VERIFIED BY: N/A <i>JMJ</i> 01-23-98 DATE:		
QAE CONCURRENCE WITH DISPOSITION (if required): N/A <i>JMJ</i> 01-23-98 DATE:	RETEST COMPLETE VERIFIED BY: N/A <i>JMJ</i> 01-23-98 DATE:		
TEST EXCEPTION CLOSED:			
TEST ENGINEER: <i>Joseph M Jones</i>		DATE: 01-23-98	
TEST DIRECTOR: <i>[Signature]</i>		DATE: 1-23-98	

OTP-320-001		Page: <u>2</u> of <u> </u>	
TEST PROCEDURE NO. & SECTION: <div style="border: 1px solid black; padding: 2px; display: inline-block;">OTP-320-001 Sec. 5.2.18</div>		TEST NAME: <div style="border: 1px solid black; padding: 2px; display: inline-block;">102-AY Annulus Vent Test</div>	
		EXCEPTION TRACKING NUMBER: <div style="border: 1px solid black; padding: 2px; display: inline-block;">002</div>	
DESCRIPTION OF PROBLEM: <div style="border: 1px solid black; padding: 5px; margin-top: 5px;"> Unable to achieve 950-1000 FPM flow. Flow test is essentially complete. Will skip to section 5.2.26 and commence 10 day data collection. </div>			
ORIGINATOR: <div style="border: 1px solid black; padding: 2px; display: inline-block;">JE Andrews franklin</div>		ORG: <u>Ops</u> DATE: <u>1/22/98</u>	
		IMPACT ON TESTING: ☐ HOLD FOR RESOLUTION ☒ CONTINUE TEST DIRECTOR: <u>franklin</u> DATE: <u>1/22/98</u>	
DISPOSITION: <u>Maximum operational capacity was reached at this point of the test. RV-1 approx. 95% closed, K2-MK-6501 100% open, FI-K2-1-1 800 FPM, -11.0 inWG. System is allowed to operate at this range even though RV-1 is not fully closed to commence temperature data collection & trending data. Continued operation of the fan at these ranges will facilitate the purging of radon build up in the system. The fan will be re-shaved to increase operational capacity of the fan.</u>			
DISPOSITION APPROVED BY: <u>Joseph M Jones</u> <div style="display: flex; justify-content: space-between;"> TEST ENGINEER (01-23-98) </div>			
DISPOSITION AND RETEST REQUIREMENTS COMPLETED BY: <u>work package 215-98-0191</u> (shave replacement) DATE: <u>01-23-98</u>		DISPOSITION ACTIONS COMPLETE VERIFIED BY: <u>Joseph M Jones</u> DATE: <u>02-11-98</u>	
QAE CONCURRENCE WITH DISPOSITION (if required): <u>N/A jmg 02-11-98</u> DATE: _____		RETEST COMPLETE VERIFIED BY: <u>N/A jmg 02-11-98</u> DATE: _____	
TEST EXCEPTION CLOSED: <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div> TEST ENGINEER: <u>Joseph M Jones</u> TEST DIRECTOR: <u>franklin</u> </div> <div> DATE: <u>02-11-98</u> DATE: <u>2/11/98</u> </div> </div>			

ATTACHMENT 3, OTP-320-001 SIGNATURE LOG

All persons involved in procedure performance, data recording, and verification or evaluation of test steps shall complete a log entry.

NAME (PRINT)	SIGNATURE	INITIALS
K J Anderson
M.C. Wingfield
Timothy A. Ryle

Jeff Davis
DR Jones
TM Fish
Cossey McLeod
DOLCE GARCIA
KR HAWK
JE Andrews
TK Fleming
Jones, Joseph

ATTACHMENT 3, OTP-320-001 SIGNATURE LOG

All persons involved in procedure performance, data recording, and verification or evaluation of test steps shall complete a log entry.

NAME (PRINT)	SIGNATURE	INITIALS
JE Andrews		JEa
KJ Anderson		KJA
Timothy A. Pyle		TAP
Greg SULLIVAN		GS
sherry white		SW
Kevin George		KG
VM Merkt		VMM
V Miller		VM
A. ARDAMICA		AAA
ROGER GARCIA		RG

ATTACHMENT 3, OTP-320-001 SIGNATURE LOG

All persons involved in procedure performance, data recording, and verification or evaluation of test steps shall complete a log entry.

NAME (PRINT)	SIGNATURE	INITIALS
K5 Anderson		KA
Looney McLean		LM
QED		QED
Mr. A. Gomez		AG
Dr. Jones		DJ
St. White		SW
Lamethy A. Ritz		LAR
Tr. Fry		TF
J. Fisher		JF
KR Hager		KR
DR Horsland		DR
me Kumbel		me
VM Morkt		VM
A. BRODANICA		AB

ATTACHMENT 3, OTP-320-001 SIGNATURE LOG

All persons involved in procedure performance, data recording, and verification or evaluation of test steps shall complete a log entry.

NAME (PRINT)	SIGNATURE	INITIALS
GREGORY J. SULLIVAN	Gregory J. Sullivan	JS
DR Jones	Donald R Jones	DRJ
JP Duncanson	JP Duncanson	JPD
McBROD Corey W	Corey McBrod	CM
JE Andrews	JE Andrews	JEa

ATTACHMENT 4, VENTILATION SYSTEM DATA SHEET

TIME ↓	TK-241-AY-102 VACUUM	ANNULUS EXHAUST DUCT VACUUM	ANNULUS VACUUM	INLET AIR SYSTEM			OUTLET AIR SYSTEM			ANNULUS FAN FLOW VELOCITY	CAM 102-AY	INITIALS
	(*) PR-102-1 (inWG)	(*) PI-K2-1-5 (inWG)	(*) PI-102-AY (inWG)	PI-K2-1-1 (inWG)	PI-K2-2-1 (inWG)	Ambient Air (#) AMBIENT (°F)	HEPA Bank 1 PI-K2-1-3 (inWG)	HEPA Bank 2 PI-K2-1-4 (inWG)	Outlet Air TI-K2-1-2 (°F)	FI-K2-1-1 (FPM)	(CPM)	↓
ALLOWABLE RANGE →	-0.25 to -6.0	0.0 to -17	-0.01 to -14.0	0 to 1.0	0 to 1.5	N/A	0.03 to 3.0	0.03 to 3.0	55 to 180	700 to 1000	0 to 550	ALLOWABLE ← RANGE
1-21-98 0950	-2.0	-3.9	-3.0	.01	Ø	15°	.15	.25	56°	1000	100	JAP
1035	-2.0	-4.0	-3.5	0	Ø	34	.2	.3	56	1000	110	BY
1105	-2.0	-4.0	-3.5	0	Ø	34	.15	.3	56	1000	120	BY
1145	-2.0	-4.5	-4.0	.01	Ø	39.5°	.15	.25	57°	950	150	JAP
1215	-2.0	-4.6	-4.0	.01	Ø	39.0°	.15	.25	57°	950	150	JAP
1245	-2.0	-4.6	-4.25	.01	Ø	42.0°	.15	.25	58°	950	125	JAP
1321	-2.0	-4.6	-4.25	.01	Ø	40.0°	.15	.25	58°	950	125	JAP
1400	-2.0	-6.0	-5.5	.01	Ø	35.0°	.15	.25	57°	900	150	Q10
1430	-2.0	-6.0	-5.5	.01	Ø	35.0°	.15	.25	57°	875	200	Q10
1509	-2.0	-6.5	-6.5	.01	Ø	35.0°	.15	.25	57°	800	350	Q10
1539	-2.0	-6.5	-6.5	.0	Ø	35.0	.1	.2	57	800	450	Q10
1740	-2.0	-7.5	-7.5	.0	Ø	30.0	.1	.2	56	750	500	Q10
1810	-2.0	-7.5	-7.5	.0	Ø	31	.1	.2	56	750	500	Q10
2325	-2.0	-8.5	-8.5	.0	Ø	31	.1	.2	56	700	605	Q10
2355	-2.0	-8.5	-8.5	.0	Ø	31	.1	.2	56	700	250	Q10

① W2000 4000 2200 App 1-21-98 ~ 32°C

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	OTP-320-001	A-0	1/19/98	29 of 34

①

ATTACHMENT 4, VENTILATION SYSTEM DATA SHEET

TIME ↓	TK-241-AV-102 VACUUM (inHG)	ANNULUS EXHAUST DUCT VACUUM (inHG)	ANNULUS VACUUM (inHG)	INLET AIR SYSTEM			OUTLET AIR SYSTEM			ANNULUS FAN FLOW VELOCITY (FPM)	CAM 102-AV (CPM)	INITIALS ↓
				Prefilter	Inlet Filter	Ambient Air (#)	HEPA Bank 1	HEPA Bank 2	Outlet Air			
	(*) PR-102-1 (inHG)	(*) PI-K2-1-5 (inHG)	(*) PI-102-AV (inHG)	PI-K2-1-1 (inHG)	PI-K2-1-2 (inHG)	N/A	PI-K2-1-3 (inHG)	PI-K2-1-4 (inHG)	TI-K2-1-2 (°F)	F1-K2-1-1 (FPM)	(CPM)	
ALLOWABLE RANGE →	-0.25 to -6.0	0.0 to -17	-0.01 to -16.0	0 to 1.0	0 to 1.5	N/A	0.03 to 3.0	0.03 to 3.0	55 to 180	700 to 1000	0 to 550	ALLOWABLE ← RANGE
0045	-2.1	-9.5	-9.5	0	0	30	.1	.2	56	750	350	RL
0115	-2.1	-9.5	-9.5	0	0	30	.1	.2	56	750	400	RL
0145	-2.1	-10.4	-10.50	0	0	30	.05	.2	56	800	400	TRM
0215	-2.05	-10.25	-10.50	0	0	30	.05	.2	56	800	400	QEM
0305	-2.05	-10.75	-11.0	0	0	30	.1	.2	56	800	400	QEM
0335	-2.05	-10.75	-11.0	0	0	30	.1	.2	56	800	400	QEM
0630	-3.10	-10.75	-11.0	0	0	28	.1	.2	56	800	300	TRM
0830	-3.5	-10.8	-11.0	.01	0	30	.1	.2	56	800	250	TRM
1130	-2.1	-10.8	-11.0	.01	0	32	.1	.2	56	800	250	TRM
0430	-2.2	-10.8	-11.0	.01	0	32	.1	.2	56	800	200	TRM

(*) Current calibration required
(#) Use thermometer or temperature indicator

ATTACHMENT 4, VENTILATION SYSTEM DATA SHEET

TIME ↓	TK-241-AY-102 VACUUM	ANNULUS EXHAUST DUCT VACUUM	ANNULUS VACUUM	INLET AIR SYSTEM			OUTLET AIR SYSTEM			ANNULUS FAN FLOW VELOCITY	CAM 102-AY	INITIALS ↓
				Prefilter	Inlet Filter	Ambient Air	HEPA Bank 1	HEPA Bank 2	Outlet Air			
				PI-K2-1-1 (inWG)	PI-K2-1-2 (inWG)	(#) AMBIENT (°F)	PI-K2-1-3 (inWG)	PI-K2-1-4 (inWG)	TI-K2-1-2 (°F)		FI-K2-1-1 (FPM)	(CPM)
ALLOWABLE RANGE →	-0.25 to -6.0	0.0 to -19.0	-0.01 to -19.0	0 to 1.0	0 to 1.5	N/A	0.03 to 3.0	0.03 to 3.0	55 to 180	700 to 1100	N/A	ALLOWABLE ← RANGE
1/23/98 2110	-2.1	-4.25	-3.5	0	0	32°	.15	.3	55°	1000	450	CAF
2206	-2.1	-11.0	-11.0	.1	.1	39°	.15	.3	56	900	200	LF
2250	-2.1	-12.0	-12.0	.1	.1	42°	.15	.3	57	900	400	LF
2320	-2.1	-12.0	-12.0	.1	.1	44°	.15	.3	57	900	600	LF
1-21-98 0001	-2.1	-13.0	-13.0	.01	.01	44°	.15	.3	57°	800	500	CAF
0031	-2.1	-13.0	-13.0	.01	0	45°	.2	.3	57°	750	1200	RL
0113	-2.1	-14.0	-14.0	.01	0	47°	.2	.3	57°	800	1400	RL
0143	-2.1	-14.0	-14.0	.01	0	47°	.2	.3	57°	800	1700	RL
0240	-2.1	-15.0	-15.0	.01	.01	42°	.15	.3	58°	850	2000	CAF
0308	-2.1	-15.0	-15.0	.01	.01	40°	.15	.3	58°	800	1800	CAF
0415	-2.05	-15.5	-15.5	.01	.01	42°	.15	.3	58°	950	2000	CAF
0445	-2.05	-15.5	-15.5	.01	.01	40°	.15	.3	59°	950	2000	CAF
0745	-2.05	-15.5	-15.5	.03	.05	46	.15	.3	58	900	1750	VMH
1045	-2.05	-15.5	-15.5	.03	.05	45	.2	.3	58	900	1500	VMH
1345	-2.0	-15.5	-15.5	.03	.05	50	.2	.3	60	900	1500	VMH
1645	-2.0	-15.5	-15.5	.03	.05	48	.15	.3	58	800	1500	VMH

60

HNF-2317
Rev 0
Date 44

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	OTP-320-001	A-1	1/23/98	31 of 37

③

ATTACHMENT 4, VENTILATION SYSTEM DATA SHEET

TIME ↓	TK-241-AY-102 VACUUM	ANNULUS EXHAUST DUCT VACUUM	ANNULUS VACUUM	INLET AIR SYSTEM			OUTLET AIR SYSTEM			ANNULUS FAN FLOW VELOCITY	CAM 102-AY	INITIALS ↓
				Prefilter	Inlet Filter	Ambient Air	HEPA Bank 1	HEPA Bank 2	Outlet Air			
				(*) PI-K2-1-5 (inWG)	(*) PI-K2-1-2 (inWG)	(#) AMBIENT (°F)	PI-K2-1-3 (inWG)	PI-K2-1-4 (inWG)	TI-K2-1-2 (°F)			
ALLOWABLE RANGE →	-0.25 to -6.0	0.0 to -19.0	-0.01 to -19.0	0 to 1.0	0 to 1.5	N/A	0.03 to 3.0	0.03 to 3.0	55 to 180	700 to 1100	N/A	ALLOWABLE ← RANGE
1-26-78 0145	-2.0 -15.5	-15.5	-15.5	.01	.1	32°	.1	.3	58°	900	1000	RG
0445	-2.05 -15.5	-15.5	-15.5	.01	.1	31°	.1	.3	58°	900	950	RG
0745	-2.05 -16	-16	-15.6	.02	.05	32	.1	.25	58	800	800	RP
1045	-2.0	-16	-15.6	.02	.04	48	.1	.3	60	900	900	WJ
1-26-78												

(#) Use thermometer or temperature indicator

(#) Use thermometer or temperature indicator

ATTACHMENT 4, VENTILATION SYSTEM DATA SHEET

TIME ↓	TK-241-AY-102 VACUUM (INHG)	ANNULUS EXHAUST DUCT VACUUM (INHG)	ANNULUS VACUUM (INHG)	INLET AIR SYSTEM			OUTLET AIR SYSTEM			ANNULUS FAN FLOW VELOCITY (FPM)	CAM 102-AY	INITIALS ↓
				Prefilter	Inlet Filter	Ambient Air (#) AMBIENT (°F)	HEPA Bank 1 P1-K2-1-3 (INHG)	HEPA Bank 2 P1-K2-1-4 (INHG)	Outlet Air T1-K2-1-2 (°F)			
ALLOWABLE RANGE →	(*) PR-102-1 (INHG) -0.25 to -6.0	(*) P1-K2-1-5 (INHG) 0.0 to -19.0	(*) P1-102-AY (INHG) -0.01 to -19.0	P1-K2-1-1 (INHG) 0 to 1.0	P1-K2-1-2 (INHG) 0 to 1.5	N/A	0.03 to 3.0	0.03 to 3.0	55 to 180	700 to 1100	N/A	ALLOWABLE ← RANGE
14:00	-15.5	-15.5	-15.5	.04	.02	50	.12	.3	60	900	1,000	LS
17:00	-1.9	-15.5	-15.5	.03	.02	41	.15	.25	60	900	1100	RP
19:45	-1.9	-15.5	-15.5	.03	.02	41	.15	.25	60	900	900	PM
22:45	-1.9	-15.5	-15.5	.03	.02	41	.15	.25	60	900	900	SM
1-27-98 01:45	-2.2	-15.5	-15.5	.03	.02	37	.15	.3	57	850	950	RL
01:48	-2.15	-15.5	-15.5	.03	.02	37	.15	.25	57	900	950	RL
07:45	-2.15	-15.5	-15.5	.04	.05	38	.15	.3	57	800	700	27
10:45	-2.1	-15.5	-15.5	.04	.04	46	.15	.3	60	950	800	LS
13:45	-2.1	-15.0	-15.0	.04	.04	56	.15	.25	61	900	700	44
16:45	-2.1	-15.5	-15.5	.04	.04	45	.15	.25	60	900	900	27
19:45	-2.1	-15.5	-15.5	.04	.04	45	.15	.25	60	900	900	27
22:45	-2.1	-15.5	-15.5	.03	.03	34	.15	.25	58	800	800	27
1-28-98 01:45	-2.1	-15.5	-15.5	.03	.03	31	.15	.25	58	800	900	RL
04:45	-2.1	-15.5	-15.5	.03	.02	29	.15	.3	58	900	850	RL
07:45	-2.1	-15.5	-15.5	.03	.02	36	.15	.25	58	900	850	27
10:45	-2.1	-15.5	-15.5	.03	.02	52	.15	.3	60	900	800	27

HNF-2317

Rev 0

Page 46

Type

CONTINUOUS

Document No.

OTP-320-001

Rev/Mod

A-2

Release Date

1/26/98

Page

31 of 38

5

ATTACHMENT 4, VENTILATION SYSTEM DATA SHEET

TIME ↓	TK-241-AY-102 VACUUM	ANNULUS EXHAUST DUCT VACUUM	ANNULUS VACUUM	INLET AIR SYSTEM			OUTLET AIR SYSTEM			ANNULUS FAN FLOW VELOCITY	CAM 102-AY	INITIALS ↓
				Prefilter	Inlet Filter	Ambient Air	HEPA Bank 1	HEPA Bank 2	Outlet Air			
	(*) PR-102-1 (inWG)	(*) PI-K2-1-5 (inWG)	(*) PI-102-AY (inWG)	PI-K2-1-1 (inWG)	PI-K2-1-2 (inWG)	(#) AMBIENT (°F)	PI-K2-1-3 (inWG)	PI-K2-1-4 (inWG)	TI-K2-1-2 (°F)	FI-K2-1-1 (FPM)	(CPM)	
ALLOWABLE RANGE →	-0.25 to -6.0	0.0 to -19.0	-0.01 to -19.0	0 to 1.0	0 to 1.5	N/A	0.03 to 3.0	0.03 to 3.0	55 to 180	700 to 1100	N/A	ALLOWABLE ← RANGE
1345	-2.1	-15.5	-15.5	.03	.01	60°	.15	.25	60°	950	800	JAL
11045	-2.1	-15.5	-15.5	.03	.01	60°	.15	.25	60°	950	800	SAW
1945	-2.1	-15.5	-15.5	.03	.01	45°	.15	.25	58°	950	800	SAW
2245	-2.0	-15.5	-15.5	.03	.01	38	.13	.2	58	900	800	WIK
129-98 0145	-2.0	-15.5	-15.5	.03	.01	37	.3	.25	58	900	800	ALG
0445	-2.0	-15.5	-15.5	.03	.01	35	.15	.2	58	950	800	ALG
0745	-2.0	-15.5	-15.5	.03	.01	40°	.15	.25	58	850	800	32
1045	-2.0	-15.5	-15.5	.03	.01	53	.15	.25	60	900	800	SV
1345	-2.0	-15.5	-15.5	.03	.01	45	.15	.25	60	800	1000	JT
1645	-2.0	-15.5	-15.5	.03	.01	46	.15	.25	60	900	150	SAW
(*) Current calibration required												
(#) Use thermometer or temperature indicator												

6

ATTACHMENT 4, VENTILATION SYSTEM DATA SHEET

TIME ↓	TK-241-AY-102 VACUUM	ANNULUS EXHAUST DUCT VACUUM	ANNULUS VACUUM	INLET AIR SYSTEM			OUTLET AIR SYSTEM			ANNULUS FAN FLOW VELOCITY	CAM 102-AY	INITIALS ↓
				Prefilter	Inlet Filter	Ambient Air	HEPA Bank 1	HEPA Bank 2	Outlet Air			
	(*) PR-102-1 (inWG)	(*) PI-K2-1-5 (inWG)	(*) PI-102-AY (inWG)	PI-K2-1-1 (inWG)	PI-K2-1-2 (inWG)	(#) AMBIENT (°F)	PI-K2-1-3 (inWG)	PI-K2-1-4 (inWG)	TI-K2-1-2 (°F)	FI-K2-1-1 (FPM)	(CPM)	
ALLOWABLE RANGE →	-0.25 to -6.0	0.0 to -19.0	-0.01 to -19.0	0 to 1.0	0 to 1.5	N/A	0.03 to 3.0	0.03 to 3.0	55 to 180	700 to 1100	N/A	ALLOWABLE ← RANGE
1945	-2.0	-15.5	-15.5	.03	.01	40	.25	.15	58	900	175	OK
2245	-2.0	-15.5	-15.5	.03	.01	40	.25	.15	58	900	150	OK
1-30-98 0145	-2.0	-15.5	-15.5	.02	.01	34	.25	.2	58	850	150	OK
0445	-2.0	-15.5	-15.5	.03	.01	32	.3	.2	58	900	150	OK
0745	-2.0	-15.5	-15.5	.03	.01	31	.1	.2	58	800	110	OK
1045	-2.0	-15.8	-15.5	.04	.01	56	.1	.25	61	975	110	OK
1345	-2.0	-15.7	-15.5	.03	.01	56	.15	.25	61	1050	110	OK
1645	-2.0	-15.7	-15.5	.03	.01	36	.15	.25	60	1050	150	OK
1945	-2.0	-15.7	-15.5	.03	.01	32	.15	.25	58	850	150	OK
2245	-2.0	-15.7	-15.5	.03	.01	32	.2	.25	57	850	150	OK
1-30-98 0145	-2.0	-15.8	-15.5	.03	.01	32	.15	.25	56	850	150	OK
0445	-2.0	-15.8	-15.7	.03	.01	30	.15	.25	56	850	150	OK
0745	-2.0	-15.8	-15.8	.03	.01	38	.2	.25	58	850	150	OK
1045	-2.0	-15.7	-15.8	.03	.02	48	.2	.25	60	900	140	OK
1345	-2.0	-15.5	-15.7	.03	.02	50	.2	.25	60	900	170	OK
1645	-2.05	-15.7	-15.5	.03	.02	58	.15	.3	61	1000	150	OK

ted on: Jan 31, 98 15:22 pm

ATTACHMENT 4. VENTILATION SYSTEM DATA SHEET

[illegible]

~~See X
Net 0.000000 2/1/00~~

ATTACHMENT 4, VENTILATION SYSTEM DATA SHEET

TIME ↓	TK-241-AY-102 VACUUM	ANNULUS EXHAUST DUCT VACUUM	ANNULUS VACUUM	INLET AIR SYSTEM			OUTLET AIR SYSTEM			ANNULUS FAN FLOW VELOCITY	CAM 102-AY	INITIALS ↓
				Prefilter	Inlet Filter	Ambient Air	HEPA Bank 1	HEPA Bank 2	Outlet Air			
				(*) PI-K2-1-1 (inWG)	PI-K2-1-2 (inWG)	(#) AMBIENT (°F)	PI-K2-1-3 (inWG)	PI-K2-1-4 (inWG)	TI-K2-1-2 (°F)			
ALLOWABLE RANGE →	-0.25 to -6.0	0.0 to -19.0	-0.01 to -19.0	0 to 1.0	0 to 1.5	N/A	0.03 to 3.0	0.03 to 3.0	55 to 180	700 to 1100	N/A	ALLOWABLE ← RANGE
0745	-2.0	-15.7	-15.5	.03	.04	33	.15	.25	58	900	200	KXJ
1045	-2.0	-15.7	-15.5	.04	.04	78	.15	.25	60	900	200	KXJ
1345	-2.0	-15.7	-15.5	.04	.04	49	.15	.3	59	800	175	KXJ
1645	-2.0	-15.7	-15.5	.04	.04	40	.15	.25	59	900	175	KXJ
1945	-2.1	-15.5	-15.5	.04	.04	38	.15	.25	58	900	150	OK
2245	-2.05	-15.5	-15.5	.03	.05	37	.15	.2	58	900	200	VMM
0145	-2.05	-15.5	-15.5	.03	.04	37	.15	.2	58	900	200	OK
0445	-2.0	-15.6	-15.5	.03	.03	31	.15	.2	57	800	200	OK
0745	-2.0	-15.5	-15.5	.04	.03	34	.15	.25	58	900	300	KB
1045	-2.0	-15.5	-15.5	.03	.02	40	.15	.25	58	800	350	KB
1345	-2.0	-15.5	-15.5	.03	.02	46	.1	.3	60	900	400	WV
1645	-2.0	-15.5	-15.5	.03	.02	40	.2	.3	58	800	400	WV
1945	-2.0	-15.5	-15.5	.03	.02	42	.2	.3	57	800	400	
2145	-2.0	-15.5	-15.5	.03	.02	41	.2	.2	58	500	400	WV
0145	-2.0	-15.5	-15.5	.02	.02	39	.2	.2	58	800	400	WV
0445	-2.0	-15.5	-15.5	.03	.02	39	.2	.2	58	800	400	WV

 HNF-2317
 Rev 0
 Date 0

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	OTP-320-001	A-3	1/27/98	31 of 39

(9)

ATTACHMENT 4, VENTILATION SYSTEM DATA SHEET

[illegible]

ATTACHMENT 4, VENTILATION SYSTEM DATA SHEET

TIME ↓	TK-241-AY-102 VACUUM	ANNULUS EXHAUST DUCT VACUUM	ANNULUS VACUUM	INLET AIR SYSTEM			OUTLET AIR SYSTEM			ANNULUS FAN FLOW VELOCITY	CAM 102-AY	INITIALS ↓
				Prefilter	Inlet Filter	Ambient Air	HEPA Bank 1	HEPA Bank 2	Outlet Air			
	(*) PR-102-1 (inWG)	(*) PI-K2-1-5 (inWG)	(*) PI-102-AY (inWG)	PI-K2-1-1 (inWG)	PI-K2-1-2 (inWG)	(#) AMBIENT (°F)	PI-K2-1-3 (inWG)	PI-K2-1-4 (inWG)	TI-K2-1-2 (°F)	FI-K2-1-1 (FPM)	(CPM)	
ALLOWABLE RANGE →	-0.25 to -6.0	0.0 to -19.0	-0.01 to -19.0	0 to 1.0	0 to 1.5	N/A	0.03 to 3.0	0.03 to 3.0	55 to 180	700 to 1100	N/A	ALLOWABLE ← RANGE
2-3/98 19:45	-2.1	-15.5	-15.5	.04	.01	40	.15	.3	58	900	300	SY
13:45	-2.1	-15.5	-15.5	.02	.01	44	.1	.2	58	800	400	TF
16:15	-2.05	-15.5	-15.5	.02	.01	43	.1	.2	58	800	600	TF
19:15	-2.1	-15.5	-15.5	.03	.01	40	.2	.3	58	900	280	FL
22:15	-2.1	-15.5	-15.5	.03	.01	40	.2	.3	58	900	300	FL
2/4/98 01:15	-2.05	-15.5	-15.5	.03	.01	40	.2	.3	58	900	250	FL
04:15	-2.05	-15.5	-15.5	.02	.01	40	.2	.2	58	900	250	FL
07:15	-2.05	-15.5	-15.5	.02	.01	40	.2	.2	57	850	300	TF
10:15	-2.05	-15.5	-15.5	.02	.01	40	.2	.2	58	850	350	TF
13:15	-2.05	-15.5	-15.5	.02	.01	40	.2	.3	60	900	300	TF
16:15	-2.1	-15.5	-15.5	.04	.01	46	.2	.3	60	900	300	SY
19:15	-2.05	-15.5	-15.5	.04	.03	40	.15	.3	59	950	300	AAA
22:15	-2.0	-15.5	-15.5	.04	.03	37°	.15	.25	59	900	300	AAA
2/5/98 01:15	-2.0	-15.5	-15.5	.03	.02	37°	.15	.3	58	900	300	AAA
04:15	-2.1	-15.5	-15.5	.03	.02	38°	.1	.25	59	900	275	AAA
07:15	-2.1	-15.5	-15.5	.03	.02	39	.1	.25	58	900	300	TF

① Switched times to accommodate furnaces

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	OTP-320-001	A-3	1/27/98	31 of 39

11

Sheet 2/5/98

ATTACHMENT 4, VENTILATION SYSTEM DATA SHEET

TIME ↓	TK-241-AY-102 VACUUM	ANNULUS EXHAUST DUCT VACUUM	ANNULUS VACUUM	INLET AIR SYSTEM			OUTLET AIR SYSTEM			ANNULUS FAN FLOW VELOCITY	CAM 102-AY	INITIALS ↓
				Prefilter	Inlet Filter	Ambient Air	HEPA Bank 1	HEPA Bank 2	Outlet Air			
	(*) PR-102-1 (inWG)	(*) PI-K2-1-5 (inWG)	(*) PI-102-AY (inWG)	PI-K2-1-1 (inWG)	PI-K2-1-2 (inWG)	(#) AMBIENT (°F)	PI-K2-1-3 (inWG)	PI-K2-1-4 (inWG)	TI-K2-1-2 (°F)	FI-K2-1-1 (FPM)	(CPM)	
ALLOWABLE RANGE →	-0.25 to -6.0	0.0 to -19.0	-0.01 to -19.0	0 to 1.0	0 to 1.5	N/A	0.03 to 3.0	0.03 to 3.0	55 to 180	700 to 1100	N/A	ALLOWABLE ← RANGE
1015	-2.05	-15.7	-15.6	.04	.03	39	.15	.25	58	900	300	LS
1315	-2.1	-15.5	-15.5	.03	.02	40	.15	.25	58	900	300	TF
1615	-2.05	-15.5	-15.5	.04	.02	46	.15	.25	60	900	300	LS
1915	-2.0	-15.7	-15.5	.04	.02	42	.15	.3	59	900	300	AAA
2215	-2.0	-15.7	-15.5	.03	.02	42	.15	.3	58	900	300	AAA
0115	-2.0	-15.5	-15.5	.03	.02	40	.15	.25	58	900	350	AAA
0415	-2.0	-15.5	-15.5	.03	.02	40	.15	.3	59	850	350	AAA
0715	-2.0	-15.5	-15.5	.03	.02	39	.15	.3	58	850	375	O.E
1015	-2.0	-15.5	-15.5	.03	.05 ^{PR}	46	.2	.3	59	900	400	UAM
1315	-2.0	-15.5	-15.5	.03	.05 ^{PR}	50	.2	.3	60	875	375	DE
1615	-2.0	-15.5	-15.5	.03	.02	40	.2	.3	59	875	375	O.E
1915	-2.0	-15.6	-15.5	.03	.03	40	.15	.25	58	870	450	DAW
2215	-2.0	-15.5	-15.5	.03	.03	40	.15	.25	58	850	380	DAW
0115	-2.0	-15.5	-15.5	.03	.03	38	.15	.25	59	900	350	DAW
0415	-2.0	-15.5	-15.5	.03	.03	35	.15	.25	58	870	320	DAW
0715	-2.0	-15.5	-15.5	.03	.03	33	.15	.25	59	825	398	D.C

2-6-98

HNF-2317
Rev 0
Page 53

2-7-98

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	OTP 320-001	A-3	1/27/98	31 of 39

(12)

ATTACHMENT 4, VENTILATION SYSTEM DATA SHEET

TIME ↓	TK-241-AY-102 VACUUM (INHG)	ANNULUS EXHAUST DUCT VACUUM (INHG)	ANNULUS VACUUM (INHG)	INLET AIR SYSTEM			OUTLET AIR SYSTEM			ANNULUS FAN FLOW VELOCITY (FPM)	CAM 102-AY (CPM)	INITIALS ↓
				Prefilter	Inlet Filter	Ambient Air (#)	HEPA Bank 1	HEPA Bank 2	Outlet Air			
	(*) PR-102-1 (INHG)	(*) P1-K2-1-5 (INHG)	(*) P1-102-AY (INHG)	P1-K2-1-1 (INHG)	P1-K2-1-2 (INHG)	AMBIENT (°F)	P1-K2-1-3 (INHG)	P1-K2-1-4 (INHG)	T1-K2-1-2 (°F)	F1-K2-1-1 (FPM)	(CPM)	
ALLOWABLE RANGE →	-0.25 to -6.0	0.0 to -19.0	-0.01 to -19.0	0 to 1.0	0 to 1.5	N/A	0.03 to 3.0	0.03 to 3.0	55 to 180	700 to 1100	N/A	ALLOWABLE ← RANGE
2-7-98 1015	-2.0	-15.5	-15.5	.03	.05	58	.15	.2	62	800	400	
1315	-2.0	-15.5	-15.5	.03	.05	70	.15	.2	62	875	400	AS
1615	-2.0	-15.5	-15.5	.03	.05	60	.15	.2	60	850	390	DE
1915	-2.0	-15.5	-15.5	.03	.03	44	.15	.25	60	870	300	DM
2015	-2.0	-15.5	-15.5	.03	.04	43	.15	.25	59	850	350	DM
0115	-2.0	-15.5	-15.5	.03	.03	36	.15	.25	59	890	370	DM
0415	-2.0	-15.4	-15.5	.03	.03	34	.15	.25	58	900	420	DM
0715	-2.0	-15.5	-15.5	.03	.02	38	.15	.25	59	800	420	DE
1015	-2.0	-15.5	-15.5	.03	.05	53	.2	.3	60	900	400	MM
1315	-2.0	-15.5	-15.5	.03	.05	50	.2	.3	60	825	400	DE
1615	-2.0	-15.5	-15.5	.03	.05	50	.2	.3	50	800	300	DE
1915	-2.0	-15.5	-15.5	.03	.03	46	.15	.25	59	870	250	DM
2215	-2.0	-15.5	-15.5	.03	.03	44	.15	.25	59	880	280	DM
0115	-2.0	-15.5	-15.5	.03	.03	41	.15	.25	58	900	220	DM
0415	-2.0	-15.5	-15.5	.03	.03	37	.15	.25	58	850	210	DM
0715	-2.0	-16.0	-15.5	.03	.03	39	.2	.3	58	700	200	MM

ATTACHMENT 4, VENTILATION SYSTEM DATA SHEET

TIME ↓	TK-241-AY-102 VACUUM	ANNULUS EXHAUST DUCT VACUUM	ANNULUS VACUUM	INLET AIR SYSTEM			OUTLET AIR SYSTEM			ANNULUS FAN FLOW VELOCITY	CAM 102-AY	INITIALS ↓
				Prefilter	Inlet Filter	Ambient Air	HEPA Bank 1	HEPA Bank 2	Outlet Air			
				(*) PI-K2-1-1 (inWG)	(*) PI-K2-1-2 (inWG)	(#) AMBIENT (°F)	PI-K2-1-3 (inWG)	PI-K2-1-4 (inWG)	TI-K2-1-2 (°F)			
ALLOWABLE RANGE →	-0.25 to -6.0	0.0 to -19.0	-0.01 to -19.0	0 to 1.0	0 to 1.5	N/A	0.03 to 3.0	0.03 to 3.0	55 to 180	700 to 1100	N/A	ALLOWABLE ← RANGE
1015	-2.0	-15.9	-15.6	.04	.02	61	.15	.3	62	975	200	JS
1315	-2.0	-15.8	-15.6	.04	.02	72	.15	.3	62	1100	700	JS
1615	-2.0	-15.8	-15.6	.04	.02	52	.2	.3	62	1000	200	JS
1915	-2.1	-15.5	-15.5	.03	.03	36	.15	.25	59	850	250	JS
2215	-2.0	-15.7	-15.6	.03	.03	36	.15	.25	58	870	260	JS
0115	-2.0	-15.6	-15.6	.03	.03	30	.15	.25	57	860	350	JS
0415	-2.0	-15.7	-15.7	.03	.03	30	.15	.25	57	850	370	JS
0715	-2.0	-16.0	-15.6	.04	.025	32	.2	.3	58	900	350	KJC
1015	-2.0	-16.0	-15.75	.04	.025	39	.2	.3	58	800	400	KJM
1315	-2.0	-15.75	-15.5	.03	.02	49	.2	.3	60	850	400	KJM
1637	-2.0	-16.0	-16.5	.03	0	42	0	.1	59	0	400	JS
1707	-2.0	-16.00	-16.5	.03	0	41	0	.1	58	0	400	JS

ATTACHMENT 5, TEMPERATURE DATA SHEET

SLUDGE TEMPERATURES

THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO ¹ LIMIT	AS FOUND (°F **)			
					(Enter time at top of each column)			
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	Start up 075	0950	0310	0340
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	015	015	015	015
TE-102-AY-71	NE PROFILE (4 IN.)	2200	152/152	195°F	Start up 015	0950	0310	0340
TE-102-AY-72	SE SLUDGE (4 IN.)	2201	153/153	195°F	015	015	015	015
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	78	78	76	76

ENDNOTE: LCO¹: BIO-LCO 3.3.2, Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
TE-102-AY-1	7'/SE	2100	088/088	N/A	Start up 82	0950	0310	0340
TE-102-AY-2	7'/SW	2101	089/089	N/A	80	80	75	75
TE-102-AY-3	7'/NW	2102	090/090	N/A	81	81	80	79
TE-102-AY-4	7'/NE	2103	091/091	N/A	77	77	74	74
TE-102-AY-5	21'/SE	2104	092/092	N/A	83	83	82	82
TE-102-AY-6	21'/SW	2105	093/093	N/A	90	90	88	88
TE-102-AY-7	21'/W	2106	094/094	N/A	80	80	78	78
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	Start up 75	—	—	—
TE-102-AY-10	21'/NE	2110	096/096	N/A	76	77	75	75
TE-102-AY-11	21'/SE	2111	097/097	N/A	80	80	78	78
TE-102-AY-12	36'/SE	2112	098/098	N/A	73	73	73	73
TE-102-AY-13	36'/SW	2113	099/099	N/A	70	70	71	71
TE-102-AY-14	36'/SW	2115	101/100	N/A	72	72	73	72
TE-102-AY-15	36'/SW	2116	102/101	N/A	69	69	70	70
TE-102-AY-16	36'/W	2117	103/102	N/A	70	70	70	70

HNF-2317

Rev 0

Page 56

INSULATING CONCRETE TEMPERATURES (Cont.)

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	1/21/98 AS FOUND (°F) (Enter time at top of each column.)			
					5/5 ⁺	0950	0310	0340
TE-102-AY-17	36°/NW	2120	104/103	N/A	72	72	72	72
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	0/5	—	—	—
TE-102-AY-19	36°/NW	2121	105/104	N/A	0/5	0/5	0/5	0/5
TE-102-AY-21	36°/NE	2123	107/106	N/A	71	71	71	71
TE-102-AY-22	36°/NE	2124	108/107	N/A	70	70	71	71
TE-102-AY-23	36°/E	2125	109/108	N/A	69	69	70	70
TE-102-AY-24	36°/SE	2126	110/109	N/A	70	70	71	71
TE-102-AY-25	36°/SE	2127	111/110	N/A	70	70	71	71

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column.)			
					5/5 ⁺	0950	0310	0340
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	66	65	66	66
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	66	66	67	67

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND 0310 0340			
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	0/5	0/5	0/5	0/5
TE-102-AY-44	8	2146	126/125	N/A	0/5	0/5	0/5	0/5
TE-102-AY-50	16	2154	132/131	N/A	66	66	66	66
TE-102-AY-54	20	2522	362/135	N/A	0/5	0/5	0/5	0/5
TE-102-AY-59	11	2164	140/140	N/A	75	75	75	75

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

HNF-2317

Rev 0

Page 57

INSULATING CONCRETE TEMPERATURES (Cont.) 1/22/98

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					06:30	15:30		
TE-102-AY-17	36'/NW	2120	104/103	N/A	72	72		
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	06:30	015		
TE-102-AY-19	36'/NW	2121	105/104	N/A	06:30	71		
TE-102-AY-21	36'/NE	2123	107/106	N/A	70	71		
TE-102-AY-22	36'/NE	2124	108/107	N/A	70	71		
TE-102-AY-23	36'/E	2125	109/108	N/A	70	71		
TE-102-AY-24	36'/SE	2126	110/109	N/A	70	71		
TE-102-AY-25	36'/SE	2127	111/110	N/A	71	71		

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					06:30	15:35		
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	66	66		
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	67	67		

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F **)			
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	06:30	015		
TE-102-AY-44	8	2146	126/125	N/A	06:30	015		
TE-102-AY-50	16	2154	132/131	N/A	66	66		
TE-102-AY-54	20	2522	362/135	N/A	06:30	015		
TE-102-AY-59	11	2164	140/140	N/A	75	74		

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

ATTACHMENT 5, TEMPERATURE DATA SHEET

SLUDGE TEMPERATURES 1/22/98								
THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO ¹ LIMIT	AS FOUND (°F **)			
					(Enter time at top of each column)			
					06:30	15:30		
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	72	72		
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	67	65		
TE-102-AY-71	NE PROFILE (4 IN.)	2200	152/152	195°F	67	65		
TE-102-AY-72	SE SLUDGE (4 IN.)	2201	153/153	195°F	67	65		
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	75	74		

ENDNOTE: LCO¹: BIO-LCO 3.3.2, Waste Temperature
 (*) Known Out Of Service Thermocouples Removed From Data Sheet.
 (#) May be out of service.
 (**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES								
THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
					06:30	15:30		
TE-102-AY-1	7' SE	2100	088/088	N/A	77	76		
TE-102-AY-2	7' SW	2101	089/089	N/A	74	71		
TE-102-AY-3	7' NW	2102	090/090	N/A	80	79		
TE-102-AY-4	7' NE	2103	091/091	N/A	71	70		
TE-102-AY-5	21' SE	2104	092/092	N/A	81	80		
TE-102-AY-6	21' SW	2105	093/093	N/A	87	86		
TE-102-AY-7	21' W	2106	094/094	N/A	76	75		
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	67	65		
TE-102-AY-10	21' NE	2110	096/096	N/A	87	74		
TE-102-AY-11	21' SE	2111	097/097	N/A	77	76		
TE-102-AY-12	36' SE	2112	098/098	N/A	73	73		
TE-102-AY-13	36' SW	2113	099/099	N/A	71	71		
TE-102-AY-14	36' SW	2115	101/100	N/A	73	73		
TE-102-AY-15	36' SW	2116	102/101	N/A	70	70		
TE-102-AY-16	36' W	2117	103/102	N/A	70	70		

HNF-2317

Rev 0

Page 59

ATTACHMENT 5, TEMPERATURE DATA SHEET

SLUDGE TEMPERATURES					1-27-98			
THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO ¹ LIMIT	AS FOUND (°F **)			
					(Enter time at top of each column)			
					2110	0745	1045	1345
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	72	72	72	71
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	0/5	0/5	0/5	0/5
TE-102-AY-71(#)	NE PROFILE (4 IN.)	2200	152/152	195°F	0/5	0/5	0/5	0/5
TE-102-AY-72(#)	SE SLUDGE (4 IN.)	2201	153/153	195°F	0/5	0/5	0/5	0/5
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	75	74	73	73

ENDNOTE:LCO¹: BIO-LCO 3.3.2, Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES								
THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					2110	0745	1045	1345
TE-102-AY-1	7'/SE	2100	088/088	N/A	79	76	75	74
TE-102-AY-2	7'/SW	2101	089/089	N/A	77	73	71	71
TE-102-AY-3	7'/NW	2102	090/090	N/A	78	79	77	77
TE-102-AY-4	7'/NE	2103	091/091	N/A	74	70	68	68
TE-102-AY-5	21'/SE	2104	092/092	N/A	82	80	79	78
TE-102-AY-6	21'/SW	2105	093/093	N/A	88	86	84	84
TE-102-AY-7	21'/W	2106	094/094	N/A	79	76	75	75
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	N/A	N/A	N/A	N/A
TE-102-AY-10	21'/NE	2110	096/096	N/A	75	74	73	72
TE-102-AY-11	21'/SE	2111	097/097	N/A	78	76	75	75
TE-102-AY-12	36'/SE	2112	098/098	N/A	73	73	73	73
TE-102-AY-13	36'/SW	2113	099/099	N/A	71	72	71	71
TE-102-AY-14	36'/SW	2115	101/100	N/A	73	73	70	73
TE-102-AY-15	36'/SW	2116	102/101	N/A	69	71	70	70
TE-102-AY-16	36'/W	2117	103/102	N/A	70	71	70	70

HNF-2317

Rev 0

Page 60

Type	Document No.	Rev/Mod	RE
CONTINUOUS	OTP-320-001	A-1	

INSULATING CONCRETE TEMPERATURES (Cont.)

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					2110	0745	1045	1345
TE-102-AY-17	36' / NW	2120	104/103	N/A	72	73	72	71
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	N/A	N/A	N/A	N/A
TE-102-AY-19	36' / NW	2121	105/104	N/A	0/5	0/5	0/5	0/5
TE-102-AY-21	36' / NE	2123	107/106	N/A	70	71	70	70
TE-102-AY-22	36' / NE	2124	108/107	N/A	70	71	70	70
TE-102-AY-23	36' / E	2125	109/108	N/A	70	71	70	70
TE-102-AY-24	36' / SE	2126	110/109	N/A	70	71	70	70
TE-102-AY-25	36' / SE	2127	111/110	N/A	71	72	71	71

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					2110	0745	1045	1345
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	66	66	66	67
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	67	68	67	67

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	2110	AS FOUND (°F **)		
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	0/5	0745	0/5	0/5
TE-102-AY-44	8	2146	126/125	N/A	0/5	0/5	0/5	0/5
TE-102-AY-50	16	2154	132/131	N/A	79	66	66	66
TE-102-AY-54	20	2522	362/135	N/A	0/5	0/5	0/5	0/5
TE-102-AY-59	11	2164	140/140	N/A	74	75	73	73

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

ATTACHMENT 5, TEMPERATURE DATA SHEET

SLUDGE TEMPERATURES						AS FOUND (°F)**			
THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO ¹ LIMIT		(Enter time at top of each column)			
						1645	1945	2245	0145
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F		72	72	72	72
TE-102-AY-68(8)	NW PROFILE (4 IN.)	2175	149/149	195°F		0/5	0/5	0/5	0/5
TE-102-AY-71(8)	NE PROFILE (4 IN.)	2200	152/152	195°F		0/5	0/5	0/5	0/5
TE-102-AY-72(8)	SE SLUDGE (4 IN.)	2201	153/153	195°F		0/5	0/5	0/5	0/5
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F		73	72	72	72

ENDNOTE: LCO¹: BIO-LCO 3.3.2, Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES						AS FOUND (°F)			
THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A		(Enter time at top of each column)			
						1645	1945	2245	0145
TE-102-AY-1	7' SE	2100	088/088	N/A		73	73	73	72
TE-102-AY-2	7' SW	2101	089/089	N/A		70	70	70	69
TE-102-AY-3	7' NW	2102	090/090	N/A		76	89	76	76
TE-102-AY-4	7' NE	2103	091/091	N/A		67	67	67	67
TE-102-AY-5	21' SE	2104	092/092	N/A		78	78	78	78
TE-102-AY-6	21' SW	2105	093/093	N/A		83	83	83	83
TE-102-AY-7	21' W	2106	094/094	N/A		74	75	74	74
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A		71A	NA	NA	NA
TE-102-AY-10	21' NE	2110	096/096	N/A		71	72	72	72
TE-102-AY-11	21' SE	2111	097/097	N/A		74	75	74	74
TE-102-AY-12	36' SE	2112	098/098	N/A		72	73	73	73
TE-102-AY-13	36' SW	2113	099/099	N/A		70	71	71	71
TE-102-AY-14	36' SW	2115	101/100	N/A		72	73	73	73
TE-102-AY-15	36' SW	2116	102/101	N/A		69	70	70	70
TE-102-AY-16	36' W	2117	103/102	N/A		69	70	71	71

INSULATING CONCRETE TEMPERATURES (Cont.) 12495

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					1645	1945	2245	0145
TE-102-AY-17	36'/NW	2120	104/103	N/A	71	71	71	72
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	NA	NA	NA	NA
TE-102-AY-19	36'/NW	2121	105/104 ^{ACG} ₍₁₀₃₎	N/A	0/5	209	220	270
TE-102-AY-21	36'/NE	2123	107/106	N/A	69	70	69	70
TE-102-AY-22	36'/NE	2124	108/107	N/A	69	70	77	71
TE-102-AY-23	36'/E	2125	109/108	N/A	69	70	70	70
TE-102-AY-24	36'/SE	2126	110/109	N/A	69	70	70	70
TE-102-AY-25	36'/SE	2127	111/110	N/A	70	71	71	72

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					1645	1945	2245	0145
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	66	66	66	68
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	66	67	67	67

AIRLIFT CIRCULATOR TEMPERATURES 1945 2245 0145

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F **)			
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	0/5	0/5	0/5	0/5
TE-102-AY-44	8	2146	126/125	N/A	0/5	0/5	0/5	0/5
TE-102-AY-50	16	2154	132/131	N/A	605	65	65	66
TE-102-AY-54	20	2522	362/135	N/A	0/5	0/5	0/5	0/5
TE-102-AY-59	11	2164	140/140	N/A	73	73	73	74

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

ATTACHMENT 5, TEMPERATURE DATA SHEET

SLUDGE TEMPERATURES					
THEMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO ¹ LIMIT	1-25-98 AS FOUND (°F **) (Enter time at top of each column)
					0445 0745 1045 B45
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	71 72 71 71
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	68 65 66 65
TE-102-AY-71(#)	NE PROFILE (4 IN.)	2200	152/152	195°F	68 62 65 65
TE-102-AY-72(#)	SE SLUDGE (4 IN.)	2201	153/153	195°F	68 65 65 68
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	71 71 71 70

ENDNOTE: LCO¹: BIO-LCO 3.3.2, Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES					
THEMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)
					0445 0745 1045 B45
TE-102-AY-1	7'/SE	2100	088/088	N/A	71 71 70 70
TE-102-AY-2	7'/SW	2101	089/089	N/A	68 68 68 66
TE-102-AY-3	7'/NW	2102	090/090	N/A	76 76 73 75
TE-102-AY-4	7'/NE	2103	091/091	N/A	66 66 66 68
TE-102-AY-5	21'/SE	2104	092/092	N/A	77 77 76 76
TE-102-AY-6	21'/SW	2105	093/093	N/A	82 81 80 80
TE-102-AY-7	21'/W	2106	094/094	N/A	73 73 73 72
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	NA NA NA NA
TE-102-AY-10	21'/NE	2110	096/096	N/A	71 71 70 70
TE-102-AY-11	21'/SE	2111	097/097	N/A	73 73 72 72
TE-102-AY-12	36'/SE	2112	098/098	N/A	73 73 73 72
TE-102-AY-13	36'/SW	2113	099/099	N/A	71 70 70 70
TE-102-AY-14	36'/SW	2115	101/100	N/A	72 72 72 72
TE-102-AY-15	36'/SW	2116	102/101	N/A	70 70 70 69
TE-102-AY-16	36'/W	2117	103/102	N/A	70 70 70 70

INSULATING CONCRETE TEMPERATURES (Cont.)

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					0445	0745	1045	1345
TE-102-AY-17	36'/NW	2120	104/103	N/A	72	71	71	71
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	N/A	N/A	N/A	N/A
TE-102-AY-19	36'/NW	2121	105/104	N/A	(95)	(95)	71	(95)
TE-102-AY-21	36'/NE	2123	107/106	N/A	70	70	69	69
TE-102-AY-22	36'/NE	2124	108/107	N/A	70	70	70	70
TE-102-AY-23	36'/E	2125	109/108	N/A	70	70	69	69
TE-102-AY-24	36'/SE	2126	110/109	N/A	70	70	70	69
TE-102-AY-25	36'/SE	2127	111/110	N/A	71	71	71	71

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					0445	0745	1045	1345
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	66	66	66	66
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	67	67	66	66

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F **)			
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	(95)	(95)	(95)	(95)
TE-102-AY-44	8	2146	126/125	N/A	(95)	(95)	(95)	(95)
TE-102-AY-50	16	2154	132/131	N/A	65	65	64	64
TE-102-AY-54	20	2522	362/135	N/A	(95)	(95)	(95)	(95)
TE-102-AY-59	11	2164	140/140	N/A	73	73	73	72

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

ATTACHMENT 5, TEMPERATURE DATA SHEET

SLUDGE TEMPERATURES <i>1-26-98</i>					
THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO ¹ LIMIT	AS FOUND (°F **)
					(Enter time at top of each column)
					<i>0445 0745 1045 1345</i>
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	<i>71 71 70 71</i>
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	<i>63 65 65 63</i>
TE-102-AY-71(#)	NE PROFILE (4 IN.)	2200	152/152	195°F	<i>65 63 63 65</i>
TE-102-AY-72(#)	SE SLUDGE (4 IN.)	2201	153/153	195°F	<i>65 63 65 65</i>
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	<i>71 69 68 65</i>

ENDNOTE: LCO¹: BIO-LCO 3.3.2, Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)
					(Enter time at top of each column)
					<i>0445 0745 1045 1345</i>
TE-102-AY-1	7'/SE	2100	088/088	N/A	<i>69 68 67 68</i>
TE-102-AY-2	7'/SW	2101	089/089	N/A	<i>66 65 64 65</i>
TE-102-AY-3	7'/NW	2102	090/090	N/A	<i>74 74 74 73</i>
TE-102-AY-4	7'/NE	2103	091/091	N/A	<i>65 64 63 63</i>
TE-102-AY-5	21'/SE	2104	092/092	N/A	<i>75 75 74 74</i>
TE-102-AY-6	21'/SW	2105	093/093	N/A	<i>80 79 79 79</i>
TE-102-AY-7	21'/W	2106	094/094	N/A	<i>72 71 71 71</i>
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	<i>N/A N/A N/A N/A</i>
TE-102-AY-10	21'/NE	2110	096/096	N/A	<i>70 69 69 68</i>
TE-102-AY-11	21'/SE	2111	097/097	N/A	<i>72 71 70 70</i>
TE-102-AY-12	36'/SE	2112	098/098	N/A	<i>72 72 72 72</i>
TE-102-AY-13	36'/SW	2113	099/099	N/A	<i>70 70 70 70</i>
TE-102-AY-14	36'/SW	2115	101/100	N/A	<i>73 72 73 72</i>
TE-102-AY-15	36'/SW	2116	102/101	N/A	<i>70 70 69 69</i>
TE-102-AY-16	36'/W	2117	103/102	N/A	<i>70 70 70 69</i>

HNF-2317

Rev 0

Page 66

INSULATING CONCRETE TEMPERATURES (Cont.) 1-26-98

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					0445	0745	1045	1345
TE-102-AY-17	36' /NW	2120	104/103	N/A	71	71	71	70
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	N/A	N/A	N/A	N/A
TE-102-AY-19	36' /NW	2121	105/104	N/A	013	013	013	013
TE-102-AY-21	36' /NE	2123	107/106	N/A	70	69	69	68
TE-102-AY-22	36' /NE	2124	108/107	N/A	70	70	70	69
TE-102-AY-23	36' /E	2125	109/108	N/A	70	69	69	69
TE-102-AY-24	36' /SE	2126	110/109	N/A	69	69	69	69
TE-102-AY-25	36' /SE	2127	111/110	N/A	71	71	72	71

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					0445	0745	1045	1345
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	66	66	67	65
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	67	66	67	65

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	0445	0745	1045	1345
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	013	013	013	013
TE-102-AY-44	8	2146	126/125	N/A	013	013	013	013
TE-102-AY-50	16	2154	132/131	N/A	65	65	64	64
TE-102-AY-54	20	2522	362/135	N/A	013	013	013	013
TE-102-AY-59	11	2164	140/140	N/A	72	72	72	71

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

HNF-2317

Rev 0

Page 67

ATTACHMENT 5, TEMPERATURE DATA SHEET

SLUDGE TEMPERATURES

THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO ¹ LIMIT	AS FOUND (°F **)			
					(Enter time at top of each column)			
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	1645	1945	2245	0445
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	71	71	71	71
TE-102-AY-71(#)	NE PROFILE (4 IN.)	2200	152/152	195°F	0/5	0/5	0/5	0/5
TE-102-AY-72(#)	SE SLUDGE (4 IN.)	2201	153/153	195°F	0/5	0/5	0/5	0/5
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	68	69	68	68

ENDNOTE: LCO¹: BIO-LCO 3.3.2, Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
TE-102-AY-1	7'/SE	2100	088/088	N/A	1645	1945	2245	0145
TE-102-AY-2	7'/SW	2101	089/089	N/A	68	68	68	68
TE-102-AY-3	7'/NW	2102	090/090	N/A	65	65	65	64
TE-102-AY-4	7'/NE	2103	091/091	N/A	73	73	73	73
TE-102-AY-5	21'/SE	2104	092/092	N/A	64	64	64	64
TE-102-AY-6	21'/SW	2105	093/093	N/A	74	74	73	74
TE-102-AY-7	21'/W	2106	094/094	N/A	79	79	79	79
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	71	71	71	76
TE-102-AY-10	21'/NE	2110	096/096	N/A	0/5	0/5	0/5	0/5
TE-102-AY-11	21'/SE	2111	097/097	N/A	69	69	69	67
TE-102-AY-12	36'/SE	2112	098/098	N/A	71	71	71	76
TE-102-AY-13	36'/SW	2113	099/099	N/A	72	72	72	72
TE-102-AY-14	36'/SW	2115	101/100	N/A	70	70	72	69
TE-102-AY-15	36'/SW	2116	102/101	N/A	72	72	72	72
TE-102-AY-16	36'/W	2117	103/102	N/A	69	69	70	69
					70	70	70	70

HNF-2317

Rev 0

Page 68

INSULATING CONCRETE TEMPERATURES (Cont.)

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					1645	1945	2245	0145
TE-102-AY-17	36'/NW	2120	104/103	N/A	70	70	71	70
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	0/5	0/5	0/5	0/5
TE-102-AY-19	36'/NW	2121	105/104	N/A	0/5	0/5	0/5	0/5
TE-102-AY-21	36'/NE	2123	107/106	N/A	69	69	69	69
TE-102-AY-22	36'/NE	2124	108/107	N/A	70	70	70	70
TE-102-AY-23	36'/E	2125	109/108	N/A	69	69	69	69
TE-102-AY-24	36'/SE	2126	110/109	N/A	69	69	69	69
TE-102-AY-25	36'/SE	2127	111/110	N/A	71	71	71	71

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					1645	1945	2245	0145
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	66	66	66	66
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	66	66	67	67

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F **)			
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	0/5	0/5	0/5	0/5
TE-102-AY-44	8	2146	126/125	N/A	0/5	0/5	0/5	0/5
TE-102-AY-50	16	2154	132/131	N/A	64	64	64	64
TE-102-AY-54	20	2522	362/135	N/A	0/5	0/5	0/5	0/5
TE-102-AY-59	11	2164	140/140	N/A	71	71	71	71

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

ATTACHMENT 5, TEMPERATURE DATA SHEET

SLUDGE TEMPERATURES								
THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO ¹ LIMIT 1-27-98	AS FOUND (°F **)			
					(Enter time at top of each column)			
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	0445	0745	1045	1345
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	063	093	08	053
TE-102-AY-71(#)	NE PROFILE (4 IN.)	2200	152/152	195°F	063	093	08	053
TE-102-AY-72(#)	SE SLUDGE (4 IN.)	2201	153/153	195°F	093	013	08	053
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	68	68	68	68

ENDNOTE: LCO¹: BIO-LCO 3.3.2, Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES					AS FOUND (°F)			
THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A 1-27-98	(Enter time at top of each column)			
					0445	0745	1045	1245
TE-102-AY-1	7'/SE	2100	088/088	N/A	67	67	68	67
TE-102-AY-2	7'/SW	2101	089/089	N/A	64	64	64	64
TE-102-AY-3	7'/NW	2102	090/090	N/A	73	73	73	72
TE-102-AY-4	7'/NE	2103	091/091	N/A	64	63	64	64
TE-102-AY-5	21'/SE	2104	092/092	N/A	74	73	74	73
TE-102-AY-6	21'/SW	2105	093/093	N/A	78	78	78	78
TE-102-AY-7	21'/W	2106	094/094	N/A	70	70	71	70
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	063	093	083	053
TE-102-AY-10	21'/NE	2110	096/096	N/A	69	69	69	69
TE-102-AY-11	21'/SE	2111	097/097	N/A	70	70	70	70
TE-102-AY-12	36'/SE	2112	098/098	N/A	72	72	72	71
TE-102-AY-13	36'/SW	2113	099/099	N/A	69	69	70	69
TE-102-AY-14	36'/SW	2115	101/100	N/A	72	72	72	71
TE-102-AY-15	36'/SW	2116	102/101	N/A	70	69	70	70
TE-102-AY-16	36'/W	2117	103/102	N/A	70	69	70	70

HNF-2317

Rev 0

Page 70

INSULATING CONCRETE TEMPERATURES (Cont.)

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
				1-27-98	0445	0745	1045	1345
TE-102-AY-17	36°/NW	2120	104/103	N/A	70	70	71	70
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	075	075	075	075
TE-102-AY-19	36°/NW	2121	105/104	N/A	69	69	69	69
TE-102-AY-21	36°/NE	2123	107/106	N/A	69	69	69	68
TE-102-AY-22	36°/NE	2124	108/107	N/A	70	70	70	70
TE-102-AY-23	36°/E	2125	109/108	N/A	69	69	69	69
TE-102-AY-24	36°/SE	2126	110/109	N/A	69	69	69	69
TE-102-AY-25	36°/SE	2127	111/110	N/A	71	71	71	70

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
				1-27-98	0445	0745	1045	1345
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	66	66	66	66
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	66	66	67	67

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F **)			
					0445	TIME	TIME	TIME
					075	075	075	075
TE-102-AY-42	6	2144	124/123	N/A	075	075	075	075
TE-102-AY-44	8	2146	126/125	N/A	075	075	075	075
TE-102-AY-50	16	2154	132/131	N/A	64	64	64	64
TE-102-AY-54	20	2522	362/135	N/A	075	075	075	075
TE-102-AY-59	11	2164	140/140	N/A	71	71	70	71

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

HNF-2317

Rev 0

Page 71

ATTACHMENT 5, TEMPERATURE DATA SHEET

1120/90

SLUDGE TEMPERATURES								
THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO ¹ LIMIT	AS FOUND (°F **)			
					(Enter time at top of each column)			
					1645	1945	2245	0445
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	71	72	72	71
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	67	65	63	63
TE-102-AY-71(#)	NE PROFILE (4 IN.)	2200	152/152	195°F	63	63	63	63
TE-102-AY-72(#)	SE SLUDGE (4 IN.)	2201	153/153	195°F	63	63	63	63
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	68	68	68	68

ENDNOTE: LCO¹: BIO-LCO 3.3.2, Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES								
THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					1645	1945	2245	0445
TE-102-AY-1	7' SE	2100	088/088	N/A	67	68	67	66
TE-102-AY-2	7' SW	2101	089/089	N/A	64	65	65	64
TE-102-AY-3	7' NW	2102	090/090	N/A	72	72	73	72
TE-102-AY-4	7' NE	2103	091/091	N/A	64	64	64	64
TE-102-AY-5	21' SE	2104	092/092	N/A	73	74	74	73
TE-102-AY-6	21' SW	2105	093/093	N/A	78	78	78	73
TE-102-AY-7	21' W	2106	094/094	N/A	70	70	71	70
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	63	63	63	63
TE-102-AY-10	21' NE	2110	096/096	N/A	69	69	68	69
TE-102-AY-11	21' SE	2111	097/097	N/A	70	70	70	70
TE-102-AY-12	36' SE	2112	098/098	N/A	72	72	72	71
TE-102-AY-13	36' SW	2113	099/099	N/A	69	70	70	69
TE-102-AY-14	36' NW	2115	101/100	N/A	72	72	70	72
TE-102-AY-15	36' SW	2116	102/101	N/A	69	70	70	70
TE-102-AY-16	36' W	2117	103/102	N/A	70	70	71	70

INSULATING CONCRETE TEMPERATURES (Cont.)

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
TE-102-AY-17	36°/NW	2120	104/103	N/A	1645	1945	2245	0145
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	073	075	078	073
TE-102-AY-19	36°/NW	2121	105/104	N/A	70	69	69	70
TE-102-AY-21	36°/NE	2123	107/106	N/A	69	69	70	68
TE-102-AY-22	36°/NE	2124	108/107	N/A	70	70	70	69
TE-102-AY-23	36°/E	2125	109/108	N/A	69	69	69	70
TE-102-AY-24	36°/SE	2126	110/109	N/A	69	69	69	69
TE-102-AY-25	36°/SE	2127	111/110	N/A	70	71	71	71

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	1645	1945	2245	0145
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	66	66	66	66
					66	67	67	66

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F **)			
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	073	073	073	073
TE-102-AY-44	8	2146	126/125	N/A	073	073	073	073
TE-102-AY-50	16	2154	132/131	N/A	64	64	63	68
TE-102-AY-54	20	2522	362/135	N/A	073	073	073	073
TE-102-AY-59	11	2164	140/140	N/A	71	71	71	71

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

ATTACHMENT 5, TEMPERATURE DATA SHEET

SLUDGE TEMPERATURES					
THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO ¹ LIMIT	AS FOUND (°F)**
					(Enter time at top of each column)
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	6455 0745 1045 1345
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	6455 0745 1045 1345
TE-102-AY-71(#)	NE PROFILE (4 IN.)	2200	152/152	195°F	6455 0745 1045 1345
TE-102-AY-72(#)	SE SLUDGE (4 IN.)	2201	153/153	195°F	6455 0745 1045 1345
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	6455 0745 1045 1345

ENDNOTE: LCO¹: BIO-LCO 3.3.2, Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES					
THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)
					(Enter time at top of each column)
TE-102-AY-1	7' SE	2100	088/088	N/A	6455 0745 1045 1345
TE-102-AY-2	7' SW	2101	089/089	N/A	6455 0745 1045 1345
TE-102-AY-3	7' NW	2102	090/090	N/A	6455 0745 1045 1345
TE-102-AY-4	7' NE	2103	091/091	N/A	6455 0745 1045 1345
TE-102-AY-5	21' SE	2104	092/092	N/A	6455 0745 1045 1345
TE-102-AY-6	21' SW	2105	093/093	N/A	6455 0745 1045 1345
TE-102-AY-7	21' W	2106	094/094	N/A	6455 0745 1045 1345
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	6455 0745 1045 1345
TE-102-AY-10	21' NE	2110	096/096	N/A	6455 0745 1045 1345
TE-102-AY-11	21' SE	2111	097/097	N/A	6455 0745 1045 1345
TE-102-AY-12	36' SE	2112	098/098	N/A	6455 0745 1045 1345
TE-102-AY-13	36' SW	2113	099/099	N/A	6455 0745 1045 1345
TE-102-AY-14	36' SW	2115	101/100	N/A	6455 0745 1045 1345
TE-102-AY-15	36' SW	2116	102/101	N/A	6455 0745 1045 1345
TE-102-AY-16	36' W	2117	103/102	N/A	6455 0745 1045 1345

HNF-2317

Rev 0

Page 74

INSULATING CONCRETE TEMPERATURES (Cont.)

7-24-98-116

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					1-24-98 0445	0745	1045	1345
TE-102-AY-17	36' / NW	2120	104/103	N/A	71	70	69	69
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	05	05	05	05
TE-102-AY-19	36' / NW	2121	105/104	N/A	69	70	69	69
TE-102-AY-21	36' / NE	2123	107/106	N/A	69	68	68	68
TE-102-AY-22	36' / NE	2124	108/107	N/A	68	70	68	68
TE-102-AY-23	36' / E	2125	109/108	N/A	70	69	67	68
TE-102-AY-24	36' / SE	2126	110/109	N/A	69	69	68	68
TE-102-AY-25	36' / SE	2127	111/110	N/A	71	71	70	69

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					1-24-98 0445	0745	1045	1345
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	66	66	65	66
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	66	76	65	67

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F **)			
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	05	05	05	05
TE-102-AY-44	8	2146	126/125	N/A	05	05	05	05
TE-102-AY-50	16	2154	132/131	N/A	64	64	63	63
TE-102-AY-54	20	2522	362/135	N/A	05	05	05	05
TE-102-AY-59	11	2164	140/140	N/A	71	71	70	70

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

HNF-2317

Rev 0

Page 75

ATTACHMENT 5, TEMPERATURE DATA SHEET

SLUDGE TEMPERATURES

THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO ¹ LIMIT	AS FOUND (°F **)			
					(Enter time at top of each column)			
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	1045	1245	2245	0145
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	71	71	71	71
TE-102-AY-71(#)	NE PROFILE (4 IN.)	2200	152/152	195°F	63	63	63	63
TE-102-AY-72(#)	SE SLUDGE (4 IN.)	2201	153/153	195°F	05	05	05	05
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	05	05	05	05

ENDNOTE: LCO¹: BIO-LCO 3.3.2, Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
TE-102-AY-1	7'/SE	2100	088/088	N/A	1045	1945	2245	0145
TE-102-AY-2	7'/SW	2101	089/089	N/A	66	66	66	66
TE-102-AY-3	7'/NW	2102	090/090	N/A	63	63	63	63
TE-102-AY-4	7'/NE	2103	091/091	N/A	71	71	71	71
TE-102-AY-5	21'/SE	2104	092/092	N/A	62	62	62	62
TE-102-AY-6	21'/SW	2105	093/093	N/A	72	72	72	72
TE-102-AY-7	21'/W	2106	094/094	N/A	77	77	77	77
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	69	69	70	69
TE-102-AY-10	21'/NE	2110	096/096	N/A	NA	NA	NA	NA
TE-102-AY-11	21'/SE	2111	097/097	N/A	68	68	68	68
TE-102-AY-12	36'/SE	2112	098/098	N/A	68	69	69	69
TE-102-AY-13	36'/SW	2113	099/099	N/A	71	71	71	71
TE-102-AY-14	36'/W	2115	101/100	N/A	69	69	69	69
TE-102-AY-15	36'/SW	2116	102/101	N/A	71	72	72	71
TE-102-AY-16	36'/W	2117	103/102	N/A	68	69	69	69

HNF-2317

Rev 0

Page 76

INSULATING CONCRETE TEMPERATURES (Cont.)

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
TE-102-AY-17	36' / NW	2120	104/103	N/A	1645	1645	2245	0145
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	NA	NA	NA	NA
TE-102-AY-19	36' / NW	2121	105/104	N/A	70	71	70	71
TE-102-AY-21	36' / NE	2123	107/106	N/A	68	69	69	69
TE-102-AY-22	36' / NE	2124	108/107	N/A	69	69	70	70
TE-102-AY-23	36' / E	2125	109/108	N/A	68	69	69	69
TE-102-AY-24	36' / SE	2126	110/109	N/A	68	69	69	69
TE-102-AY-25	36' / SE	2127	111/110	N/A	70	70	71	70

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	1645	1645	2245	0145
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	65	66	66	66

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	015	015	015	015
TE-102-AY-44	8	2146	126/125	N/A	015	015	015	015
TE-102-AY-50	16	2154	132/131	N/A	63	64	64	64
TE-102-AY-54	20	2522	362/135	N/A	1350	015	015	015
TE-102-AY-59	11	2164	140/140	N/A	71	71	71	71

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

ATTACHMENT 5, TEMPERATURE DATA SHEET

SLUDGE TEMPERATURES

THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO ¹ LIMIT	AS FOUND (°F **)			
					(Enter time at top of each column)			
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	129 0445	0745	1045	1345
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	615	675	695	645
TE-102-AY-71(#)	NE PROFILE (4 IN.)	2200	152/152	195°F	615	615	645	615
TE-102-AY-72(#)	SE SLUDGE (4 IN.)	2201	153/153	195°F	615	615	615	615
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	66	66	66	67

ENDNOTE: LCO¹: BIO-LCO 3.3.2, Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
TE-102-AY-1	7'/SE	2100	088/088	N/A	129 0445	0745	1045	1345
TE-102-AY-2	7'/SW	2101	089/089	N/A	66	66	65	65
TE-102-AY-3	7'/NW	2102	090/090	N/A	63	63	63	64
TE-102-AY-4	7'/NE	2103	091/091	N/A	71	71	71	71
TE-102-AY-5	21'/SE	2104	092/092	N/A	62	62	62	63
TE-102-AY-6	21'/SW	2105	093/093	N/A	72	72	72	72
TE-102-AY-7	21'/W	2106	094/094	N/A	77	77	76	76
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			095	N/A	69	69	69
TE-102-AY-10	21'/NE	2110	096/096	N/A	N/A	N/A	67	68
TE-102-AY-11	21'/SE	2111	097/097	N/A	68	68	68	68
TE-102-AY-12	36'/SE	2112	098/098	N/A	68	68	68	68
TE-102-AY-13	36'/SW	2113	099/099	N/A	71	71	71	71
TE-102-AY-14	36'/SW	2115	101/100	N/A	69	69	69	69
TE-102-AY-15	36'/SW	2116	102/101	N/A	72	72	72	72
TE-102-AY-16	36'/W	2117	103/102	N/A	69	69	69	69
					69	70	70	69

HNF-2317

Rev 0

Page 78

Type	Document No.	Rev/Mod	R
CONTINUOUS	OTP-320-001	A-3	

INSULATING CONCRETE TEMPERATURES (Cont.)

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					TIME	TIME	TIME	TIME
TE-102-AY-17	36°/NW	2120	104/103	N/A	129 0445	0745	1045	1345
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	4/1	N/A	N/A	N/A
TE-102-AY-19	36°/NW	2121	105/104	N/A	71	70	69	70
TE-102-AY-21	36°/NE	2123	107/106	N/A	68	68	68	68
TE-102-AY-22	36°/NE	2124	108/107	N/A	70	69	69	70
TE-102-AY-23	36°/E	2125	109/108	N/A	68	68	68	69
TE-102-AY-24	36°/SE	2126	110/109	N/A	69	69	68	68
TE-102-AY-25	36°/SE	2127	111/110	N/A	70	70	70	71

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					TIME	TIME	TIME	TIME
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	69 0445	0745	1045	1345
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	66	66	66	66

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)**			
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	0445	0745	0745	0745
TE-102-AY-44	8	2146	126/125	N/A	0745	0745	0745	0745
TE-102-AY-50	16	2154	132/131	N/A	64	64	64	64
TE-102-AY-54	20	2522	362/135	N/A	0745	0745	0745	0745
TE-102-AY-59	11	2164	140/140	N/A	71	70	70	71

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

22

ATTACHMENT 5, TEMPERATURE DATA SHEET

SLUDGE TEMPERATURES					
THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO ¹ LIMIT	AS FOUND (°F **) (Enter time at top of each column)
					1645 1945 2245 0145 129
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	71 71 71 71
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	63 63 63 63
TE-102-AY-71(#)	NE PROFILE (4 IN.)	2200	152/152	195°F	63 63 63 63
TE-102-AY-72(#)	SE SLUDGE (4 IN.)	2201	153/153	195°F	63 63 63 63
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	66 67 67 66

ENDNOTE: LCO¹: BIO-LCO 3.3.2, Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES					
THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)
					1645 1945 2245 0145 129
TE-102-AY-1	71/SE	2100	088/088	N/A	66 66 66 66
TE-102-AY-2	71/SW	2101	089/089	N/A	63 63 63 63
TE-102-AY-3	71/NW	2102	090/090	N/A	71 71 71 71
TE-102-AY-4	71/NE	2103	091/091	N/A	62 62 62 63
TE-102-AY-5	21/SE	2104	092/092	N/A	72 72 72 71
TE-102-AY-6	21/SW	2105	093/093	N/A	77 77 77 77
TE-102-AY-7	21/W	2106	094/094	N/A	69 69 70 69
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	NA NA NA NA
TE-102-AY-10	21/NE	2110	096/096	N/A	68 68 68 68
TE-102-AY-11	21/SE	2111	097/097	N/A	68 69 69 69
TE-102-AY-12	36/SE	2112	098/098	N/A	71 71 71 71
TE-102-AY-13	36/SW	2113	099/099	N/A	69 69 69 69
TE-102-AY-14	36/SW	2115	101/100	N/A	71 72 72 71
TE-102-AY-15	36/SW	2116	102/101	N/A	68 69 69 69
TE-102-AY-16	36/W	2117	103/102	N/A	69 69 70 69

23

HNF-2317

Rev 0

Page 80

INSULATING CONCRETE TEMPERATURES (Cont.)

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
TE-102-AY-17	36°/NW	2120	104/103	N/A	1645	1948	2245	0145
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	NA	NA	NA	NA
TE-102-AY-19	36°/NW	2121	105/104	N/A	70	71	70	71
TE-102-AY-21	36°/NE	2123	107/106	N/A	68	69	69	69
TE-102-AY-22	36°/NE	2124	108/107	N/A	69	69	70	70
TE-102-AY-23	36°/E	2125	109/108	N/A	68	69	69	69
TE-102-AY-24	36°/SE	2126	110/109	N/A	68	69	69	69
TE-102-AY-25	36°/SE	2127	111/110	N/A	70	70	71	70

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	1645	1948	2245	0145
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	65	66	66	66

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	015	015	015	015
TE-102-AY-44	8	2146	126/125	N/A	015	015	015	015
TE-102-AY-50	16	2154	132/131	N/A	032	032	032	032
TE-102-AY-54	20	2522	362/135	N/A	1300	015	015	015
TE-102-AY-59	11	2164	140/140	N/A	71	71	71	71

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

24

ATTACHMENT 5, TEMPERATURE DATA SHEET

SLUDGE TEMPERATURES					
THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO ¹ LIMIT	AS FOUND (°F **)
					(Enter time at top of each column)
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	1-30 0445 0745 1045 1345
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	76 71 70 70
TE-102-AY-71(#)	NE PROFILE (4 IN.)	2200	152/152	195°F	62 68 68 68
TE-102-AY-72(#)	SE SLUDGE (4 IN.)	2201	153/153	195°F	62 68 68 68
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	66 66 66 66

ENDNOTE: LCO¹: BIO-LCO 3.3.2, Waste Temperature
 (*) Known Out Of Service Thermocouples Removed From Data Sheet.
 (#) May be out of service.
 (**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES					
THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)
					(Enter time at top of each column)
TE-102-AY-1	7'/SE	2100	088/088	N/A	1-30 0445 0745 1045 1345
TE-102-AY-2	7'/SW	2101	089/089	N/A	66 65 64 64
TE-102-AY-3	7'/NW	2102	090/090	N/A	63 62 61 61
TE-102-AY-4	7'/NE	2103	091/091	N/A	71 70 69 69
TE-102-AY-5	21'/SE	2104	092/092	N/A	63 62 61 61
TE-102-AY-6	21'/SW	2105	093/093	N/A	72 71 70 70
TE-102-AY-7	21'/W	2106	094/094	N/A	76 76 75 75
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	69 69 68 68
TE-102-AY-10	21'/NE	2110	096/096	N/A	N/A N/A ② ①
TE-102-AY-11	21'/SE	2111	097/097	N/A	68 68 67 67
TE-102-AY-12	36'/SE	2112	098/098	N/A	69 68 67 67
TE-102-AY-13	36'/SW	2113	099/099	N/A	71 71 70 70
TE-102-AY-14	36'/SW	2115	101/100	N/A	72 69 68 68
TE-102-AY-15	36'/SW	2116	102/101	N/A	71 72 71 71
TE-102-AY-16	36'/W	2117	103/102	N/A	69 69 68 68

① Scanner # 095 67°
 ② " " 66

INSULATING CONCRETE TEMPERATURES (Cont.)

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A 1-30	AS FOUND (°F) (Enter time at top of each column)			
					0845	0745	1045	1345
TE-102-AY-17	361/NW	2120	104/103	N/A	70	70	69	69
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	N/A	N/A	N/A	N/A
TE-102-AY-19	361/NW	2121	105/104	N/A	70	70	69	69
TE-102-AY-21	361/NE	2123	107/106	N/A	69	68	67	68
TE-102-AY-22	361/NE	2124	108/107	N/A	68	69	68	68
TE-102-AY-23	361/E	2125	109/108	N/A	68	69	68	68
TE-102-AY-24	361/SE	2126	110/109	N/A	68	69	68	68
TE-102-AY-25	361/SE	2127	111/110	N/A	70	71	69	70

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A 1-30	AS FOUND (°F) (Enter time at top of each column)			
					0845	0745	1045	1345
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	66	66	65	66
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	66	66	66	66

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A 1-30	AS FOUND (°F **)			
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	65	63	63	63
TE-102-AY-44	8	2146	126/125	N/A	63	63	63	63
TE-102-AY-50	16	2154	132/131	N/A	63	64	63	62
TE-102-AY-54	20	2522	362/135	N/A	63	63	63	63
TE-102-AY-59	11	2164	140/140	N/A	67	70	69	70

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

ATTACHMENT 5, TEMPERATURE DATA SHEET

SLUDGE TEMPERATURES

THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO # LIMIT	AS FOUND (°F **)			
					(Enter time at top of each column)			
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	1045	1945	2245	0145 1/30
TE-102-AY-68(##)	NW PROFILE (4 IN.)	2175	149/149	195°F	05	05	05	06
TE-102-AY-71(##)	NE PROFILE (4 IN.)	2200	152/152	195°F	05	05	05	06
TE-102-AY-72(##)	SE SLUDGE (4 IN.)	2201	153/153	195°F	05	05	05	03
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	01	07	07	06

ENDNOTE: LCO¹: BIO-LCO 3.3.2, Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
TE-102-AY-1	7' SE	2100	088/088	N/A	1045	1945	2215	0145 1/30
TE-102-AY-2	7' SW	2101	089/089	N/A	06	06	06	05
TE-102-AY-3	7' NW	2102	090/090	N/A	03	04	04	02
TE-102-AY-4	7' NE	2103	091/091	N/A	01	01	01	01
TE-102-AY-5	21' SE	2104	092/092	N/A	03	03	03	03
TE-102-AY-6	21' SW	2105	093/093	N/A	02	02	02	02
TE-102-AY-7	21' W	2106	094/094	N/A	06	06	06	06
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	NA	NA	NA	NA
TE-102-AY-10	21' NE	2110	096/096	N/A	08	08	08	08
TE-102-AY-11	21' SE	2111	097/097	N/A	08	09	08	08
TE-102-AY-12	36' SE	2112	098/098	N/A	01	01	01	01
TE-102-AY-13	36' SW	2113	099/099	N/A	09	09	09	09
TE-102-AY-14	36' SW	2115	101/100	N/A	02	02	02	01
TE-102-AY-15	36' SW	2116	102/101	N/A	09	09	09	09
TE-102-AY-16	36' W	2117	103/102	N/A	00	00	00	09

HNF-2317

Rev 0

Page 84

INSULATING CONCRETE TEMPERATURES (Cont.)

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
TE-102-AY-17	36°/NW	2120	104/103	N/A	11045	1945	2245	0145
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	NA	NA	NA	NA
TE-102-AY-19	36°/NW	2121	105/104	N/A	70	70	70	69
TE-102-AY-21	36°/NE	2123	107/106	N/A	70	70	70	69
TE-102-AY-22	36°/NE	2124	108/107	N/A	69	69	68	68
TE-102-AY-23	36°/E	2125	109/108	N/A	70	70	70	68
TE-102-AY-24	36°/SE	2126	110/109	N/A	69	69	69	68
TE-102-AY-25	36°/SE	2127	111/110	N/A	69	69	69	68

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	11045	1945	2245	0145
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	66	67	66	66

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)**			
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	65	65	65	63
TE-102-AY-44	8	2146	126/125	N/A	65	65	65	63
TE-102-AY-50	16	2154	132/131	N/A	64	64	64	63
TE-102-AY-54	20	2522	362/135	N/A	65	65	65	63
TE-102-AY-59	11	2164	140/140	N/A	70	71	71	70

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

ATTACHMENT 5, TEMPERATURE DATA SHEET

SLUDGE TEMPERATURES 1/31/98					
THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/NESTRONICS SCANNER #	LCO ¹ LIMIT	AS FOUND (°F **)
					(Enter time at top of each column)
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	0445 0745 1045 1345
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	015 06 05 05
TE-102-AY-71(#)	NE PROFILE (4 IN.)	2200	152/152	195°F	015 06 06 05
TE-102-AY-72(#)	SE SLUDGE (4 IN.)	2201	153/153	195°F	015 06 06 05
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	66 66 65 64

ENDNOTE: LCO¹: BIO-LCO 3.3.2, Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES					
THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/NESTRONICS SCANNER #	N/A	AS FOUND (°F)
					(Enter time at top of each column)
TE-102-AY-1	7'/SE	2100	088/088	N/A	0445 0745 1045 1345
TE-102-AY-2	7'/SW	2101	089/089	N/A	64 64 62 62
TE-102-AY-3	7'/NW	2102	090/090	N/A	63 61 60 60
TE-102-AY-4	7'/NE	2103	091/091	N/A	70 69 68 68
TE-102-AY-5	21'/SE	2104	092/092	N/A	62 61 60 60
TE-102-AY-6	21'/SW	2105	093/093	N/A	71 71 70 69
TE-102-AY-7	21'/W	2106	094/094	N/A	75 75 73 73
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	68 68 66 67
TE-102-AY-10	21'/NE	2110	096/096	N/A	NA NA NA NA
TE-102-AY-11	21'/SE	2111	097/097	N/A	68 67 65 66
TE-102-AY-12	36'/SE	2112	098/098	N/A	68 67 64 66
TE-102-AY-13	36'/SW	2113	099/099	N/A	71 71 68 68
TE-102-AY-14	36'/SW	2115	101/100	N/A	68 68 66 67
TE-102-AY-15	36'/SW	2116	102/101	N/A	72 71 68 70
TE-102-AY-16	36'/W	2117	103/102	N/A	69 69 66 67

HNF-2317

Rev 0

Page 86

INSULATING CONCRETE TEMPERATURES (Cont.)

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					0445	0745	1045	1345
TE-102-AY-17	36' / NW	2120	104/103	N/A	70	69	68	68
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	70	N/A	N/A	N/A
TE-102-AY-19	36' / NW	2121	105/104	N/A	70	69	68	68
TE-102-AY-21	36' / NE	2123	107/106	N/A	68	68	67	67
TE-102-AY-22	36' / NE	2124	108/107	N/A	70	69	68	68
TE-102-AY-23	36' / E	2125	109/108	N/A	68	68	67	67
TE-102-AY-24	36' / SE	2126	110/109	N/A	69	68	67	67
TE-102-AY-25	36' / SE	2127	111/110	N/A	71	83 ^{PM}	69	68

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					0445	0745	1045	1345
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	67	66	65	66
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	67	66	65	66

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F **)			
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	0445	0745	1045	1345
TE-102-AY-44	8	2146	126/125	N/A	0445	0745	1045	1345
TE-102-AY-50	16	2154	132/131	N/A	63	63	62	62
TE-102-AY-54	20	2522	362/135	N/A	0445	0745	1045	1345
TE-102-AY-59	11	2164	140/140	N/A	70	69	69	69

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

ATTACHMENT 5, TEMPERATURE DATA SHEET

1-31-98 SLUDGE TEMPERATURES 2-7-98					
THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO ¹ LIMIT	AS FOUND (°F **)
					(Enter time at top of each column)
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	1645 1945 2245 0145
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	62 60 63 60
TE-102-AY-71(#)	NE PROFILE (4 IN.)	2200	152/152	195°F	62 60 63 60
TE-102-AY-72(#)	SE SLUDGE (4 IN.)	2201	153/153	195°F	62 60 63 60
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	66 66 65 66

ENDNOTE: LCO¹: BIO-LCO 3.3.2, Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)
					(Enter time at top of each column)
TE-102-AY-1	7'/SE	2100	088/088	N/A	1645 1945 2245 0145
TE-102-AY-2	7'/SW	2101	089/089	N/A	61 64 61 64
TE-102-AY-3	7'/NW	2102	090/090	N/A	60 62 62 61
TE-102-AY-4	7'/NE	2103	091/091	N/A	67 69 69 68
TE-102-AY-5	21'/SE	2104	092/092	N/A	60 62 62 62
TE-102-AY-6	21'/SW	2105	093/093	N/A	68 71 71 71
TE-102-AY-7	21'/W	2106	094/094	N/A	73 75 75 75
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	66 69 68 68
TE-102-AY-10	21'/NE	2110	096/096	N/A	N/A N/A N/A N/A
TE-102-AY-11	21'/SE	2111	097/097	N/A	66 68 68 67
TE-102-AY-12	36'/SE	2112	098/098	N/A	65 68 68 67
TE-102-AY-13	36'/SW	2113	099/099	N/A	68 71 70 71
TE-102-AY-14	36'/SW	2115	101/100	N/A	67 69 68 68
TE-102-AY-15	36'/SW	2116	102/101	N/A	70 72 71 72
TE-102-AY-16	36'/W	2117	103/102	N/A	72 69 68 68
					67 70 69 69

HNF-2317

Rev 0

Page 88

Type	Document No.	Rev/Mod	R
CONTINUOUS	OTP-320-001	A-3	

INSULATING CONCRETE TEMPERATURES (Cont.)

2/1/98

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
TE-102-AY-17	36'/NW	2120	104/103	N/A	1645	1945	2245	0145
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	N/A	N/A	N/A	N/A
TE-102-AY-19	36'/NW	2121	105/104	N/A	69	69	68	69
TE-102-AY-21	36'/NE	2123	107/106	N/A	68	68	68	72
TE-102-AY-22	36'/NE	2124	108/107	N/A	68	69	69	69
TE-102-AY-23	36'/E	2125	109/108	N/A	73	69	68	68
TE-102-AY-24	36'/SE	2126	110/109	N/A	68	68	68	68
TE-102-AY-25	36'/SE	2127	111/110	N/A	69	70	70	70

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	66	66	66	66
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	66	66	66	66

AIRLIFT CIRCULATOR TEMPERATURES

2245

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F **)			
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	63	63	63	63
TE-102-AY-44	8	2146	126/125	N/A	63	63	63	63
TE-102-AY-50	16	2154	132/131	N/A	63	63	63	63
TE-102-AY-54	20	2522	362/135	N/A	63	63	63	63
TE-102-AY-59	11	2164	140/140	N/A	70	69	70	70

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

HNF-2317

Rev 0

Page 89

ATTACHMENT 5, TEMPERATURE DATA SHEET

SLUDGE TEMPERATURES 2/1/98						
THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO ¹ LIMIT	AS FOUND (°F **) (Enter time at top of each column)	
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	0445	
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	015	
TE-102-AY-71(#)	NE PROFILE (4 IN.)	2200	152/152	195°F	015	
TE-102-AY-72(#)	SE SLUDGE (4 IN.)	2201	153/153	195°F	015	
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	06	

ENDNOTE: LCO¹: BIO-LCO 3.3.2, Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES					
THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)
TE-102-AY-1	7'/SE	2100	088/088	N/A	0445
TE-102-AY-2	7'/SW	2101	089/089	N/A	01
TE-102-AY-3	7'/NW	2102	090/090	N/A	09
TE-102-AY-4	7'/NE	2103	091/091	N/A	01
TE-102-AY-5	21'/SE	2104	092/092	N/A	70
TE-102-AY-6	21'/SW	2105	093/093	N/A	75
TE-102-AY-7	21'/W	2106	094/094	N/A	05
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	N/A
TE-102-AY-10	21'/NE	2110	096/096	N/A	07
TE-102-AY-11	21'/SE	2111	097/097	N/A	07
TE-102-AY-12	36'/SE	2112	098/098	N/A	71
TE-102-AY-13	36'/SW	2113	099/099	N/A	08
TE-102-AY-14	36'/SW	2115	101/100	N/A	71
TE-102-AY-15	36'/SW	2116	102/101	N/A	09
TE-102-AY-16	36'/W	2117	103/102	N/A	09

INSULATING CONCRETE TEMPERATURES (Cont.)

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)		
					TIME	TIME	TIME
TE-102-AY-17	361/NW	2120	104/103	N/A	0445		
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	N/A		
TE-102-AY-19	361/NW	2121	105/104	N/A	70		
TE-102-AY-21	361/NE	2123	107/106	N/A	68		
TE-102-AY-22	361/NE	2124	108/107	N/A	69		
TE-102-AY-23	361/E	2125	109/108	N/A	68		
TE-102-AY-24	361/SE	2126	110/109	N/A	68		
TE-102-AY-25	361/SE	2127	111/110	N/A	70		

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)		
					TIME	TIME	TIME
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	66		
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	66		

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F **)			
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	63			
TE-102-AY-44	8	2146	126/125	N/A	63			
TE-102-AY-50	16	2154	132/131	N/A	63			
TE-102-AY-54	20	2522	362/135	N/A	63			
TE-102-AY-59	11	2164	140/140	N/A	70			

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

ATTACHMENT 5, TEMPERATURE DATA SHEET

SLUDGE TEMPERATURES

THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO ¹ LIMIT	AS FOUND (°F **)			
					(Enter time at top of each column)			
					0745	1045	1345	1645
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	70	69	69	70
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	68	68	68	68
TE-102-AY-71(#)	NE PROFILE (4 IN.)	2200	152/152	195°F	68	68	68	68
TE-102-AY-72(#)	SE SLUDGE (4 IN.)	2201	153/153	195°F	68	68	68	68
TF-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	67	64	64	64

2-1-98 2-1-98 2-1-98 2-1-98

ENDNOTE: LCO¹: BIO-LCO 3.3.2. Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
					0745	1045	1345	1645
TE-102-AY-1	7'/SE	2100	088/088	N/A	61	60	61	62
TE-102-AY-2	7'/SW	2101	089/089	N/A	59	59	59	60
TE-102-AY-3	7'/NW	2102	090/090	N/A	67	69	68	68
TE-102-AY-4	7'/NE	2103	091/091	N/A	59	59	60	60
TE-102-AY-5	21'/SE	2104	092/092	N/A	68	68	69	69
TE-102-AY-6	21'/SW	2105	093/093	N/A	72	73	73	73
TE-102-AY-7	21'/W	2106	094/094	N/A	67	66	66	67
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	N/A	N/A	N/A	N/A
TE-102-AY-10	21'/NE	2110	096/096	N/A	67	66	66	66
TE-102-AY-11	21'/SE	2111	097/097	N/A	67	65	66	66
TE-102-AY-12	36'/SE	2112	098/098	N/A	70	69	69	70
TE-102-AY-13	36'/SW	2113	099/099	N/A	68	67	67	68
TE-102-AY-14	36'/SW	2115	101/100	N/A	71	71	71	71
TE-102-AY-15	36'/SW	2116	102/101	N/A	68	68	68	68
TE-102-AY-16	36'/W	2117	103/102	N/A	68	68	68	68

2-1-98 2-1-98 2-1-98 2-1-98

HNF-2317

Rev 0

Page 92

INSULATING CONCRETE TEMPERATURES (Cont.)

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					0745	1045	1345	1645
TE-102-AY-17	36'/NW	2120	104/103	N/A	69	68	69	69
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	NA	NA	NA	NA
TE-102-AY-19	36'/NW	2121	105/104	N/A	69	69	69	69
TE-102-AY-21	36'/NE	2123	107/106	N/A	68	67	67	67
TE-102-AY-22	36'/NE	2124	108/107	N/A	68	68	69	69
TE-102-AY-23	36'/E	2125	109/108	N/A	68	67	67	68
TE-102-AY-24	36'/SE	2126	110/109	N/A	67	67	67	67
TE-102-AY-25	36'/SE	2127	111/110	N/A	70	70	69	69

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					0745	1045	1345	1645
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	66	66	65	64
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	66	66	65	66

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	0745	AS FOUND (°F **)			
					TIME	TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	(93)	(93)	(93)	(93)	(93)
TE-102-AY-44	8	2146	126/125	N/A	(93)	(93)	(93)	(93)	(93)
TE-102-AY-50	16	2154	132/131	N/A	63	62	62	62	62
TE-102-AY-54	20	2522	362/135	N/A	(93)	(93)	(93)	(93)	(93)
TE-102-AY-59	11	2164	140/140	N/A	69	69	68	69	69

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

ATTACHMENT 5, TEMPERATURE DATA SHEET

SLUDGE TEMPERATURES						2-148	2-248
THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO ¹ LIMIT	AS FOUND (Enter time at top of each column)	(°F **)	
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	75	71	70
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	68	63	63
TE-102-AY-71(#)	NE PROFILE (4 IN.)	2200	152/152	195°F	68	63	63
TE-102-AY-72(#)	SE SLUDGE (4 IN.)	2201	153/153	195°F	68	63	63
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	65	65	65

ENDNOTE: LCO¹: BIO-LCO 3.3.2, Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)		
TE-102-AY-1	7'/SE	2100	088/088	N/A	63	62	62
TE-102-AY-2	7'/SW	2101	089/089	N/A	60	60	60
TE-102-AY-3	7'/NW	2102	090/090	N/A	68	68	68
TE-102-AY-4	7'/NE	2103	091/091	N/A	61	61	61
TE-102-AY-5	21'/SE	2104	092/092	N/A	70	70	70
TE-102-AY-6	21'/SW	2105	093/093	N/A	73	74	73
TE-102-AY-7	21'/W	2106	094/094	N/A	68	67	67
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	66	66	N/A
TE-102-AY-10	21'/NE	2110	096/096	N/A	67	66	67
TE-102-AY-11	21'/SE	2111	097/097	N/A	66	66	67
TE-102-AY-12	36'/SE	2112	098/098	N/A	68	70	70
TE-102-AY-13	36'/SW	2113	099/099	N/A	66	68	68
TE-102-AY-14	36'/SW	2115	101/100	N/A	69	71	72
TE-102-AY-15	36'/SW	2116	102/101	N/A	66	68	68
TE-102-AY-16	36'/W	2117	103/102	N/A	67	68	69

HNF-2317

Rev 0

Page 94

INSULATING CONCRETE TEMPERATURES (Cont.)

7-198 / 2-2-98

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					1945	2245	0145	0445
TE-102-AY-17	361/NW	2120	104/103	N/A	67	69	69	69
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	015	115	N/A	N/A
TE-102-AY-19	361/NW	2121	105/104	N/A	69	69	68	69
TE-102-AY-21	361/NE	2123	107/106	N/A	68	68	68	68
TE-102-AY-22	361/NE	2124	108/107	N/A	69	69	69	68
TE-102-AY-23	361/E	2125	109/108	N/A	68	68	68	68
TE-102-AY-24	361/SE	2126	110/109	N/A	68	68	68	68
TE-102-AY-25	361/SE	2127	111/110	N/A	70	70	70	70

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					1945	2245	0145	0445
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	66	66	66	66
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	66	66	66	66

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F **)			
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	65	65	65	65
TE-102-AY-44	8	2146	126/125	N/A	65	65	65	65
TE-102-AY-50	16	2154	132/131	N/A	63	63	63	62
TE-102-AY-54	20	2522	362/135	N/A	65	65	65	65
TE-102-AY-59	11	2164	140/140	N/A	69	69	69	69

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

ATTACHMENT 5. TEMPERATURE DATA SHEET

SLUDGE TEMPERATURES ²ⁿ					
THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/NESTRONICS SCANNER #	LCO ¹ LIMIT	AS FOUND (°F **)
					(Enter time at top of each column)
					0745 1045 1345 1645
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	70 69 70 70
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	0/5 0/5 0/5 0/5
TE-102-AY-71(#)	NE PROFILE (4 IN.)	2200	152/152	195°F	0/5 0/5 0/5 0/5
TE-102-AY-72(#)	SE SLUDGE (4 IN.)	2201	153/153	195°F	0/5 0/5 0/5 0/5
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	65 64 65 65

ENDNOTE: LCO¹: BIO-LCO 3.3.2, Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/NESTRONICS SCANNER #	N/A	AS FOUND (°F)
					(Enter time at top of each column)
					0745 1045 1345 1645
TE-102-AY-1	7'/SE	2100	088/088	N/A	62 61 62 62
TE-102-AY-2	7'/SW	2101	089/089	N/A	60 59 60 08
TE-102-AY-3	7'/NW	2102	090/090	N/A	68 67 68 67
TE-102-AY-4	7'/NE	2103	091/091	N/A	60 60 61 41
TE-102-AY-5	21'/SE	2104	092/092	N/A	69 68 70 69
TE-102-AY-6	21'/SW	2105	093/093	N/A	74 73 73 73
TE-102-AY-7	21'/W	2106	094/094	N/A	67 64 67 67
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	66 NA NA NA
TE-102-AY-10	21'/NE	2110	096/096	N/A	67 66 67 67
TE-102-AY-11	21'/SE	2111	097/097	N/A	66 66 66 66
TE-102-AY-12	36'/SE	2112	098/098	N/A	70 69 70 70
TE-102-AY-13	36'/SW	2113	099/099	N/A	68 67 68 68
TE-102-AY-14	36'/SW	2115	101/100	N/A	71 71 71 72
TE-102-AY-15	36'/SW	2116	102/101	N/A	68 68 68 68
TE-102-AY-16	36'/W	2117	103/102	N/A	69 68 69 69

HNF-2317

Rev 0

Page 96

Type	Document No.	Rev/Mod	Re
CONTINUOUS	OTP-320-001	A-3	

INSULATING CONCRETE TEMPERATURES (Cont.) 3/2

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					0745	1045	1345	1645
TE-102-AY-17	36'/NW	2120	104/103	N/A	69	69	69	69
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	NA	NA	NA	NA
TE-102-AY-19	36'/NW	2121	105/104	N/A	69	69	68	69
TE-102-AY-21	36'/NE	2123	107/106	N/A	68	67	66	68
TE-102-AY-22	36'/NE	2124	108/107	N/A	69	68	67	69
TE-102-AY-23	36'/E	2125	109/108	N/A	68	67	68	68
TE-102-AY-24	36'/SE	2126	110/109	N/A	68	67	68	68
TE-102-AY-25	36'/SE	2127	111/110	N/A	70	70	70	70

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					0745	1045	1345	1645
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	66	66	66	66
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	66	66	66	66

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F **)			
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	0/5	0/5	0/5	0/5
TE-102-AY-44	8	2146	126/125	N/A	0/5	0/5	0/5	0/5
TE-102-AY-50	16	2154	132/131	N/A	62	61	63	63
TE-102-AY-54	20	2522	362/135	N/A	0/5	0/5	0/5	0/5
TE-102-AY-59	11	2164	140/140	N/A	69	69	69	69

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

ATTACHMENT 5, TEMPERATURE DATA SHEET

SLUDGE TEMPERATURES 72					
THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO ¹ LIMIT	AS FOUND (°F) ^{**/s}
					(Enter time at top of each column)
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	1945 2145 0145 0745
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	70 70 70 70
TE-102-AY-71(#)	NE PROFILE (4 IN.)	2200	152/152	195°F	015 015 015 015
TE-102-AY-72(#)	SE SLUDGE (4 IN.)	2201	153/153	195°F	015 015 015 015
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	015 015 015 015

ENDNOTE: LCO¹: BIO-LCO 3.3.2, Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES					
THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)
					(Enter time at top of each column)
TE-102-AY-1	7'/SE	2100	088/088	N/A	1945 2145 0145 0745
TE-102-AY-2	7'/SW	2101	089/089	N/A	68 68 62 62
TE-102-AY-3	7'/NW	2102	090/090	N/A	70 60 60 60
TE-102-AY-4	7'/NE	2103	091/091	N/A	68 68 67 67
TE-102-AY-5	21'/SE	2104	092/092	N/A	61 61 61 61
TE-102-AY-6	21'/SW	2105	093/093	N/A	69 69 69 69
TE-102-AY-7	21'/W	2106	094/094	N/A	73 73 73 73
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	67 68 67 67
TE-102-AY-10	21'/NE	2110	096/096	N/A	N/A N/A N/A N/A
TE-102-AY-11	21'/SE	2111	097/097	N/A	67 67 67 67
TE-102-AY-12	36'/SE	2112	098/098	N/A	66 66 66 66
TE-102-AY-13	36'/SW	2113	099/099	N/A	70 70 70 70
TE-102-AY-14	36'/SW	2115	101/100	N/A	68 68 68 68
TE-102-AY-15	36'/SW	2116	102/101	N/A	71 71 71 71
TE-102-AY-16	36'/W	2117	103/102	N/A	68 68 68 68

HNF-2317

Rev 0

Page 98

INSULATING CONCRETE TEMPERATURES (Cont.) ^{2/2}

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) ^{2/2} (Enter time at top of each column)			
					1445	2145	0145	0445
TE-102-AY-17	36°/NW	2120	104/103	N/A	69	69	69	69
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	NA	NA	NA	NA
TE-102-AY-19	36°/NW	2121	105/104	N/A	68	68	68	68
TE-102-AY-21	36°/NE	2123	107/106	N/A	68	69	69	68
TE-102-AY-22	36°/NE	2124	108/107	N/A	69	68	68	69
TE-102-AY-23	36°/E	2125	109/108	N/A	68	68	68	68
TE-102-AY-24	36°/SE	2126	110/109	N/A	68	68	69	68
TE-102-AY-25	36°/SE	2127	111/110	N/A	70	70	70	70

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					1445	2145	0145	0445
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	66	66	66	66
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	67	66	66	66

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F **)			
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	0/5	0/5	0/5	0/5
TE-102-AY-44	8	2146	126/125	N/A	0/5	0/5	0/5	0/5
TE-102-AY-50	16	2154	132/131	N/A	63	63	62	63
TE-102-AY-54	20	2522	362/135	N/A	0/5	0/5	0/5	0/5
TE-102-AY-59	11	2164	140/140	N/A	69	69	69	69

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

ATTACHMENT 5, TEMPERATURE DATA SHEET

SLUDGE TEMPERATURES ^{21b}						AS FOUND (°F **)		
THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/NESTRONICS SCANNER #	LCO ¹ LIMIT	(Enter time at top of each column)			
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	0745			
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	69			
TE-102-AY-71(#)	NE PROFILE (4 IN.)	2200	152/152	195°F	040			
TE-102-AY-72(#)	SE SLUDGE (4 IN.)	2201	153/153	195°F	040			
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	69			

ENDNOTE: LCO¹: BIO-LCO 3.3.2, Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES						AS FOUND (°F)		
THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/NESTRONICS SCANNER #	N/A	(Enter time at top of each column)			
TE-102-AY-1	7'/SE	2100	088/088	N/A	0745			
TE-102-AY-2	7'/SW	2101	089/089	N/A	61			
TE-102-AY-3	7'/NN	2102	090/090	N/A	57			
TE-102-AY-4	7'/NE	2103	091/091	N/A	67			
TE-102-AY-5	21'/SE	2104	092/092	N/A	60			
TE-102-AY-6	21'/SW	2105	093/093	N/A	65			
TE-102-AY-7	21'/W	2106	094/094	N/A	71			
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	66			
TE-102-AY-10	21'/NE	2110	096/096	N/A	N/A			
TE-102-AY-11	21'/SE	2111	097/097	N/A	66			
TE-102-AY-12	36'/SE	2112	098/098	N/A	65			
TE-102-AY-13	36'/SW	2113	099/099	N/A	67			
TE-102-AY-14	36'/SW	2115	101/100	N/A	67			
TE-102-AY-15	36'/SW	2116	102/101	N/A	70			
TE-102-AY-16	36'/W	2117	103/102	N/A	67			
					68			

HNF-2317

Rev 0

Page 100

213

INSULATING CONCRETE TEMPERATURES (Cont.)

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
TE-102-AY-17	36°/NW	2120	104/103	N/A	6:45			
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	6:58			
TE-102-AY-19	36°/NW	2121	105/104	N/A	N/A			
TE-102-AY-21	36°/NE	2123	107/106	N/A	6:58			
TE-102-AY-22	36°/NE	2124	108/107	N/A	6:58			
TE-102-AY-23	36°/E	2125	109/108	N/A	6:57			
TE-102-AY-24	36°/SE	2126	110/109	N/A	6:57			
TE-102-AY-25	36°/SE	2127	111/110	N/A	6:55			

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	6:45			
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	6:56			

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F **)			
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	6:45			
TE-102-AY-44	8	2146	126/125	N/A	6:45			
TE-102-AY-50	16	2154	132/131	N/A	6:45			
TE-102-AY-54	20	2522	362/135	N/A	6:45			
TE-102-AY-59	11	2164	140/140	N/A	6:45			

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

HNF-2317

Rev 0

Page 101

ATTACHMENT 5, TEMPERATURE DATA SHEET

2/3/98

SLUDGE TEMPERATURES

THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO ¹ LIMIT	AS FOUND (°F **)			
					(Enter time at top of each column)			
					1045	1345	1615	1915
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	69	69	69	69
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	69	69	69	69
TE-102-AY-71(#)	NE PROFILE (4 IN.)	2200	152/152	195°F	69	69	69	69
TE-102-AY-72(#)	SE SLUDGE (4 IN.)	2201	153/153	195°F	69	69	69	69
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	69	69	69	69

ENDNOTE: LCO¹: BIO-LCO 3.3.2, Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
					1045	1345	1615	1915
TE-102-AY-1	7'/SE	2100	088/088	N/A	61	62	62	62
TE-102-AY-2	7'/SW	2101	089/089	N/A	59	60	59	60
TE-102-AY-3	7'/NW	2102	090/090	N/A	67	68	66	67
TE-102-AY-4	7'/NE	2103	091/091	N/A	60	61	60	61
TE-102-AY-5	21'/SE	2104	092/092	N/A	68	69	68	69
TE-102-AY-6	21'/SW	2105	093/093	N/A	72	73	71	73
TE-102-AY-7	21'/W	2106	094/094	N/A	66	67	66	67
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	N/A	N/A	N/A	N/A
TE-102-AY-10	21'/NE	2110	096/096	N/A	66	66	66	67
TE-102-AY-11	21'/SE	2111	097/097	N/A	65	66	66	66
TE-102-AY-12	36'/SE	2112	098/098	N/A	69	70	69	69
TE-102-AY-13	36'/SW	2113	099/099	N/A	67	68	67	67
TE-102-AY-14	36'/SW	2115	101/100	N/A	71	72	71	71
TE-102-AY-15	36'/SW	2116	102/101	N/A	67	68	67	68
TE-102-AY-16	36'/W	2117	103/102	N/A	68	68	68	69

HNF-2317

Rev 0

Page 102

Type

CONTINUOUS

Document No.

OTP-320-001

Rev/Mod

A-3

2/3/98

INSULATING CONCRETE TEMPERATURES (Cont.)

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
TE-102-AY-17	36'/NW	2120	104/103	N/A	1045	1345	1615	1915
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	N/A	N/A	N/A	N/A
TE-102-AY-19	36'/NW	2121	105/104	N/A	68	68	68	67
TE-102-AY-21	36'/NE	2123	107/106	N/A	67	67	67	69
TE-102-AY-22	36'/NE	2124	108/107	N/A	68	68	68	68
TE-102-AY-23	36'/E	2125	109/108	N/A	67	67	67	67
TE-102-AY-24	36'/SE	2126	110/109	N/A	67	67	67	69
TE-102-AY-25	36'/SE	2127	111/110	N/A	69	70	69	66

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	1045	1345	1615	1915
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	65	66	65	66

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F **)			
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	073	015	015	073
TE-102-AY-44	8	2146	126/125	N/A	073	015	015	073
TE-102-AY-50	16	2154	132/131	N/A	62	62	62	62
TE-102-AY-54	20	2522	362/135	N/A	073	015	015	073
TE-102-AY-59	11	2164	140/140	N/A	68	69	68	69

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

ATTACHMENT 5, TEMPERATURE DATA SHEET

2/3/98 - 2/4/98

SLUDGE TEMPERATURES

THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO LIMIT	AS FOUND (°F **)			
					(Enter time at top of each column)			
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	2215	0115	0415	0715
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	69	69	68	68
TE-102-AY-71(#)	NE PROFILE (4 IN.)	2200	152/152	195°F	015	015	015	019
TE-102-AY-72(#)	SE SLUDGE (4 IN.)	2201	153/153	195°F	015	015	015	015
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	015	015	015	015

ENDNOTE: LCO¹: BIO-LCO 3.3.2, Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
TE-102-AY-1	7'/SE	2100	088/088	N/A	2215	0115	0415	0715
TE-102-AY-2	7'/SW	2101	089/089	N/A	62	62	62	62
TE-102-AY-3	7'/NW	2102	090/090	N/A	60	60	60	60
TE-102-AY-4	7'/NE	2103	091/091	N/A	67	67	67	67
TE-102-AY-5	21'/SE	2104	092/092	N/A	61	61	61	61
TE-102-AY-6	21'/SW	2105	093/093	N/A	69	69	69	69
TE-102-AY-7	21'/W	2106	094/094	N/A	72	73	73	72
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	67	67	67	67
TE-102-AY-10	21'/NE	2110	096/096	N/A	NA	NA	NA	NA
TE-102-AY-11	21'/SE	2111	097/097	N/A	67	67	67	67
TE-102-AY-12	36'/SE	2112	098/098	N/A	65	66	66	66
TE-102-AY-13	36'/SW	2113	099/099	N/A	69	70	70	70
TE-102-AY-14	36'/W	2115	101/100	N/A	67	68	68	67
TE-102-AY-15	36'/SW	2116	102/101	N/A	71	68	71	71
TE-102-AY-16	36'/W	2117	103/102	N/A	68	68	68	68

HNF-2317

Rev 0

Page 104

2/3/98 - 2/4/98

INSULATING CONCRETE TEMPERATURES (Cont.)

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					2215	0115	0415	0715
TE-102-AY-17	36' / NW	2120	104/103	N/A	69	69	69	69
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	NA	NA	NA	NA
TE-102-AY-19	36' / NW	2121	105/104	N/A	67	67	67	68
TE-102-AY-21	36' / NE	2123	107/106	N/A	69	69	68	67
TE-102-AY-22	36' / NE	2124	108/107	N/A	68	67	67	69
TE-102-AY-23	36' / E	2125	109/108	N/A	67	67	68	68
TE-102-AY-24	36' / SE	2126	110/109	N/A	69	69	67	66
TE-102-AY-25	36' / SE	2127	111/110	N/A	66	65	70	68

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					2215	0115	0415	0715
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	66	66	66	64
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	66	66	66	64

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F **)			
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	012	015	015	010
TE-102-AY-44	8	2146	126/125	N/A	015	015	015	010
TE-102-AY-50	16	2154	132/131	N/A	62	62	61	60
TE-102-AY-54	20	2522	362/135	N/A	015	015	015	010
TE-102-AY-59	11	2164	140/140	N/A	68	68	68	67

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

HNF-2317

Rev 0

Page 105

ATTACHMENT 5, TEMPERATURE DATA SHEET

2-4-98

SLUDGE TEMPERATURES

THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO ¹ LIMIT	AS FOUND (°F **)			
					(Enter time at top of each column)			
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	1015	1315	1615	1915
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	64	69	69	70
TE-102-AY-71(#)	NE PROFILE (4 IN.)	2200	152/152	195°F	015	015	015	015
TE-102-AY-72(#)	SE SLUDGE (4 IN.)	2201	153/153	195°F	015	015	015	015
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	64	64	64	65

ENDNOTE: LCO¹: BIO-LCO 3.3.2, Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
TE-102-AY-1	7'/SE	2100	088/088	N/A	1015	1315	1615	1915
TE-102-AY-2	7'/SW	2101	089/089	N/A	60	61	60	62
TE-102-AY-3	7'/NW	2102	090/090	N/A	59	60	59	61
TE-102-AY-4	7'/NE	2103	091/091	N/A	62	66	64	67
TE-102-AY-5	21'/SE	2104	092/092	N/A	59	61	59	62
TE-102-AY-6	21'/SW	2105	093/093	N/A	67	68	66	69
TE-102-AY-7	21'/W	2106	094/094	N/A	71	71	70	73
TE-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	66	66	65	67
TK-102-AY-7				N/A	N/A	N/A	N/A	N/A
TE-102-AY-10	21'/NE	2110	096/096	N/A	65	66	64	67
TE-102-AY-11	21'/SE	2111	097/097	N/A	64	65	64	66
TE-102-AY-12	36'/SE	2112	098/098	N/A	68	69	67	70
TE-102-AY-13	36'/SW	2113	099/099	N/A	66	67	65	68
TE-102-AY-14	36'/SW	2115	101/100	N/A	70	71	70	71
TE-102-AY-15	36'/SW	2116	102/101	N/A	67	67	66	68
TE-102-AY-16	36'/W	2117	103/102	N/A	67	68	67	68

HNF-2317

Rev 0

Page 106

Type

CONTINUOUS

Document No.

OTP-320-001

Rev/Mod

A-3

INSULATING CONCRETE TEMPERATURES (Cont.) 214

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					1015	1315	1615	1915
TE-102-AY-17	361/NW	2120	104/103	N/A	68	68	68	69
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	NA	NA	NA	NA
TE-102-AY-19	361/NW	2121	105/104	N/A	68	68	68	69
TE-102-AY-21	361/NE	2123	107/106	N/A	66	67	66	68
TE-102-AY-22	361/NE	2124	108/107	N/A	67	67	68	69
TE-102-AY-23	361/E	2125	109/108	N/A	67	68	67	68
TE-102-AY-24	361/SE	2126	110/109	N/A	66	67	66	68
TE-102-AY-25	361/SE	2127	111/110	N/A	68	66	68	70

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					1015	1315	1615	1915
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	65	65	64	65
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	65	64	64	66

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F **)			
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	015	015	015	015
TE-102-AY-44	8	2146	126/125	N/A	015	015	015	015
TE-102-AY-50	16	2154	132/131	N/A	61	62	61	62
TE-102-AY-54	20	2522	362/135	N/A	015	015	015	015
TE-102-AY-59	11	2164	140/140	N/A	68	68	68	69

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

HNF-2317
Rev 0
Page 107

ATTACHMENT 5, TEMPERATURE DATA SHEET

SLUDGE TEMPERATURES

THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO ¹ LIMIT	AS FOUND (°F **)			
					(Enter time at top of each column)			
					2/4/98 2215	2/5/98 0115	0415	0715
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	69	69	69	70
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	615	615	615	615
TE-102-AY-71(#)	NE PROFILE (4 IN.)	2200	152/152	195°F	615	615	615	615
TE-102-AY-72(#)	SE SLUDGE (4 IN.)	2201	153/153	195°F	615	615	615	615
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	65	65	64	65

ENDNOTE: LCO¹: BIO-LCO 3.3.2, Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F **)			
					(Enter time at top of each column)			
					2/4/98 2215	2/5/98 0115	0415	0715
TE-102-AY-1	7'/SE	2100	088/088	N/A	63	62	62	60
TE-102-AY-2	7'/SW	2101	089/089	N/A	61	60	60	58
TE-102-AY-3	7'/NW	2102	090/090	N/A	67	67	67	65
TE-102-AY-4	7'/NE	2103	091/091	N/A	62	61	61	59
TE-102-AY-5	21'/SE	2104	092/092	N/A	69	69	69	67
TE-102-AY-6	21'/SW	2105	093/093	N/A	73	72	72	71
TE-102-AY-7	21'/W	2106	094/094	N/A	80	67	67	65
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	NA	NA	NA	NA
TE-102-AY-10	21'/NE	2110	096/096	N/A	67	67	66	65
TE-102-AY-11	21'/SE	2111	097/097	N/A	66	66	66	64
TE-102-AY-12	36'/SE	2112	098/098	N/A	78	670	69	67
TE-102-AY-13	36'/SW	2113	099/099	N/A	68	68	67	66
TE-102-AY-14	36'/SW	2115	101/100	N/A	71	71	71	69
TE-102-AY-15	36'/SW	2116	102/101	N/A	68	68	68	66
TE-102-AY-16	36'/W	2117	103/102	N/A	68	68	68	67

① PREVIOUS READING OF 80° NOT CONSISTENT WITH OTHER READINGS. POSSIBLY FALSE READING.

HNF-2317

Rev 0

Page 108

Type	Document No.	Rev/Mod	R
CONTINUOUS	OTP-320-001	A-3	

INSULATING CONCRETE TEMPERATURES (Cont.)

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
TE-102-AY-17	36°/NW	2120	104/103	N/A	2/4/98 2315	2/5/98 0115	0415	0715
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	NA	NA	NA	N/A
TE-102-AY-19	36°/NW	2121	105/104	N/A	69	68	68	69
TE-102-AY-21	36°/NE	2123	107/106	N/A	69	68	68	69
TE-102-AY-22	36°/NE	2124	108/107	N/A	69	68	68	69
TE-102-AY-23	36°/E	2125	109/108	N/A	68	67	67	68
TE-102-AY-24	36°/SE	2126	110/109	N/A	67	67	67	68
TE-102-AY-25	36°/SE	2127	111/110	N/A	70	69	69	70

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	2/4/98 2315	2/5/98 0115	0415	0715
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	66	65	65	66

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F **)			
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	015	015	015	015
TE-102-AY-44	8	2146	126/125	N/A	015	015	015	015
TE-102-AY-50	16	2154	132/131	N/A	62	60	62	63
TE-102-AY-54	20	2522	362/135	N/A	015	015	015	015
TE-102-AY-59	11	2164	140/140	N/A	68	67	69	69

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

HNF-2317

Rev 0

Page 109

ATTACHMENT 5. TEMPERATURE DATA SHEET

SLUDGE TEMPERATURES

THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO ¹ LIMIT	AS FOUND (°F **)			
					(Enter time at top of each column)			
					1015	1315	1615	1915
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	70	69	70	70
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	0/5	0/5	0/5	0/5
TE-102-AY-71(#)	NE PROFILE (4 IN.)	2200	152/152	195°F	0/5	0/5	0/5	0/5
TE-102-AY-72(#)	SE SLUDGE (4 IN.)	2201	153/153	195°F	0/5	0/5	0/5	0/5
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	65	64	65	65

ENDNOTE: LCO¹: BIO-LCO 3.3.2, Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F **)			
					(Enter time at top of each column)			
					1015	1315	1615	1915
TE-102-AY-1	7'/SE	2100	088/088	N/A	62	61	61	62
TE-102-AY-2	7'/SW	2101	089/089	N/A	60	60	60	60
TE-102-AY-3	7'/NW	2102	090/090	N/A	67	66	66	67
TE-102-AY-4	7'/NE	2103	091/091	N/A	61	60	61	61
TE-102-AY-5	21'/SE	2104	092/092	N/A	69	68	68	69
TE-102-AY-6	21'/SW	2105	093/093	N/A	73	72	71	73
TE-102-AY-7	21'/W	2106	094/094	N/A	66	66	66	66
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	N/A	N/A	N/A	N/A
TE-102-AY-10	21'/NE	2110	096/096	N/A	67	65	65	67
TE-102-AY-11	21'/SE	2111	097/097	N/A	66	65	64	66
TE-102-AY-12	36'/SE	2112	098/098	N/A	70	69	68	70
TE-102-AY-13	36'/SW	2113	099/099	N/A	68	67	66	68
TE-102-AY-14	36'/SW	2115	101/100	N/A	71	70	70	71
TE-102-AY-15	36'/SW	2116	102/101	N/A	68	67	66	68
TE-102-AY-16	36'/W	2117	103/102	N/A	69	68	67	69

Start 2/5/98

INSULATING CONCRETE TEMPERATURES (Cont.)

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					1015	1315	1615	1915
TE-102-AY-17	36'/NW	2120	104/103	N/A	69	68	67	69
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	N/A	N/A	N/A	N/A
TE-102-AY-19	36'/NW	2121	105/104	N/A	69	68	68	69
TE-102-AY-21	36'/NE	2123	107/106	N/A	67	67	67	68
TE-102-AY-22	36'/NE	2124	108/107	N/A	69	67	67	68
TE-102-AY-23	36'/E	2125	109/108	N/A	68	68	68	68
TE-102-AY-24	36'/SE	2126	110/109	N/A	68	67	67	67
TE-102-AY-25	36'/SE	2127	111/110	N/A	70	66	69	69

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					1015	1315	1615	1915
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	66	65	65	66
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	66	66	66	66

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F **)			
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	015	015	015	015
TE-102-AY-44	8	2146	126/125	N/A	015	015	015	015
TE-102-AY-50	16	2154	132/131	N/A	62	62	63	63
TE-102-AY-54	20	2522	362/135	N/A	015	015	015	015
TE-102-AY-59	11	2164	140/140	N/A	69	68	68	69

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

ATTACHMENT 5, TEMPERATURE DATA SHEET

2-5-98 TO 2-6-98

SLUDGE TEMPERATURES

THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO ¹ LIMIT	AS FOUND (°F **)			
					(Enter time at top of each column)			
					2215	0115	0415	0715
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	70	70	70	70
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	615	615	615	615
TE-102-AY-71(#)	NE PROFILE (4 IN.)	2200	152/152	195°F	615	615	615	615
TE-102-AY-72(#)	SE SLUDGE (4 IN.)	2201	153/153	195°F	615	615	615	615
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	65	65	65	65

ENDNOTE: LCO¹: BIO-LCO 3.3.2, Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
					2215	0115	0415	0715
TE-102-AY-1	7'/SE	2100	088/088	N/A	61	62	62	62
TE-102-AY-2	7'/SW	2101	089/089	N/A	60	60	60	60
TE-102-AY-3	7'/NW	2102	090/090	N/A	66	66	66	66
TE-102-AY-4	7'/NE	2103	091/091	N/A	62	61	62	61
TE-102-AY-5	21'/SE	2104	092/092	N/A	69	69	69	69
TE-102-AY-6	21'/SW	2105	093/093	N/A	73	72	73	72
TE-102-AY-7	21'/W	2106	094/094	N/A	67	67	67	67
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	NA	NA	NA	NA
TE-102-AY-10	21'/NE	2110	096/096	N/A	67	67	67	67
TE-102-AY-11	21'/SE	2111	097/097	N/A	66	66	66	66
TE-102-AY-12	36'/SE	2112	098/098	N/A	70	70	70	69
TE-102-AY-13	36'/SW	2113	099/099	N/A	68	67	68	67
TE-102-AY-14	36'/SW	2115	101/100	N/A	71	71	71	71
TE-102-AY-15	36'/SW	2116	102/101	N/A	68	68	68	68
TE-102-AY-16	36'/W	2117	103/102	N/A	68	68	68	68

HNF-2317

Rev 0

Page 112

2-5-98 TO 2-6-98

INSULATING CONCRETE TEMPERATURES (Cont.)

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					2215	0115	0415	0715
TE-102-AY-17	36°/NW	2120	104/103	N/A	69	69	69	69
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	NA	NA	NA	NA
TE-102-AY-19	36°/NW	2121	105/104	N/A	68	69	69	69
TE-102-AY-21	36°/NE	2123	107/106	N/A	68	67	68	68
TE-102-AY-22	36°/NE	2124	108/107	N/A	68	68	69	69
TE-102-AY-23	36°/E	2125	109/108	N/A	68	68	68	68
TE-102-AY-24	36°/SE	2126	110/109	N/A	67	67	67	67
TE-102-AY-25	36°/SE	2127	111/110	N/A	69	69	69	69

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					2215	0115	0415	0715
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	66	66	66	66
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	66	66	66	66

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F **)			
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	015	015	015	015
TE-102-AY-44	8	2146	126/125	N/A	015	015	015	015
TE-102-AY-50	16	2154	132/131	N/A	63	63	62	62
TE-102-AY-54	20	2522	362/135	N/A	015	015	015	015
TE-102-AY-59	11	2164	140/140	N/A	69	69	69	69

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

HNF-2317

Rev 0

Page 113

ATTACHMENT 5. TEMPERATURE DATA SHEET

SLUDGE TEMPERATURES 2-6-98

THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO ¹ LIMIT	AS FOUND (°F **)			
					(Enter time at top of each column)			
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	1615	1315	1615	1915
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	69	70	70	70
TE-102-AY-71(#)	NE PROFILE (4 IN.)	2200	152/152	195°F	015	015	015	015
TE-102-AY-72(#)	SE SLUDGE (4 IN.)	2201	153/153	195°F	015	015	015	015
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	65	63	64	65

ENDNOTE: LCO¹: BIO-LCO 3.3.2. Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
TE-102-AY-1	7'/SE	2100	088/088	N/A	1615	1315	1615	1915
TE-102-AY-2	7'/SW	2101	089/089	N/A	60	60	60	60
TE-102-AY-3	7'/NW	2102	090/090	N/A	66	66	66	66
TE-102-AY-4	7'/NE	2103	091/091	N/A	61	61	61	61
TE-102-AY-5	21'/SE	2104	092/092	N/A	69	68	68	69
TE-102-AY-6	21'/SW	2105	093/093	N/A	72	72	72	72
TE-102-AY-7	21'/W	2106	094/094	N/A	66	66	66	67
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	NA	NA	NA	NA
TE-102-AY-10	21'/NE	2110	096/096	N/A	66	67	67	66
TE-102-AY-11	21'/SE	2111	097/097	N/A	66	66	66	66
TE-102-AY-12	36'/SE	2112	098/098	N/A	69	68	69	69
TE-102-AY-13	36'/SW	2113	099/099	N/A	67	67	67	67
TE-102-AY-14	36'/SW	2115	101/100	N/A	71	71	70	70
TE-102-AY-15	36'/SW	2116	102/101	N/A	68	68	68	68
TE-102-AY-16	36'/W	2117	103/102	N/A	68	68	68	68

HNF-2317

Rev 0

Page 114

Type	Document No.	Rev/Mod	RE
CONTINUOUS	OTP-320-001	A-3	

INSULATING CONCRETE TEMPERATURES (Cont.)

2-6-98

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/HESTRONICS SCANNER #	N/A	2-6-98 AS FOUND (°F) (Enter time at top of each column)			
					1015	1315	1615	1915
TE-102-AY-17	36'/NW	2120	104/103	N/A	68	68	68	68
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	N/A	N/A	N/A	N/A
TE-102-AY-19	36'/NW	2121	105/104	N/A	68	68	68	68
TE-102-AY-21	36'/NE	2123	107/106	N/A	67	68	67	67
TE-102-AY-22	36'/NE	2124	108/107	N/A	68	68	68	68
TE-102-AY-23	36'/E	2125	109/108	N/A	67	67	67	66
TE-102-AY-24	36'/SE	2126	110/109	N/A	67	67	67	67
TE-102-AY-25	36'/SE	2127	111/110	N/A	69	69	69	68

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/HESTRONICS SCANNER #	N/A	2-6-98 AS FOUND (°F) (Enter time at top of each column)			
					1015	1315	1615	1915
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	66	65	65	65
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	66	66	66	65

AIRLIFT CIRCULATOR TEMPERATURES

2-6-98

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/HESTRONICS SCANNER #	N/A	2-6-98 AS FOUND (°F **)			
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	615	615	615	615
TE-102-AY-44	8	2146	126/125	N/A	615	615	615	615
TE-102-AY-50	16	2154	132/131	N/A	62	62	62	63
TE-102-AY-54	20	2522	362/135	N/A	615	615	615	615
TE-102-AY-59	11	2164	140/140	N/A	68	67	69	67

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

ATTACHMENT 5. TEMPERATURE DATA SHEET

SLUDGE TEMPERATURES

6/6/98 6/7/98

THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO ¹ LIMIT	AS FOUND (°F)** (Enter time at top of each column)			
					2215	0115	0415	0715
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	70	70	70	70
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	65	65	65	65
TE-102-AY-71(#)	NE PROFILE (4 IN.)	2200	152/152	195°F	65	65	65	65
TE-102-AY-72(#)	SE SLUDGE (4 IN.)	2201	153/153	195°F	65	65	65	65
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	65	65	65	65

ENDNOTE: LCO¹: BIO-LCO 3.3.2. Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)** (Enter time at top of each column)			
					2215	0115	0415	0715
TE-102-AY-1	7'/SE	2100	088/088	N/A	62	62	62	62
TE-102-AY-2	7'/SW	2101	089/089	N/A	60	60	60	60
TE-102-AY-3	7'/NW	2102	090/090	N/A	66	66	66	66
TE-102-AY-4	7'/NE	2103	091/091	N/A	61	61	61	61
TE-102-AY-5	21'/SE	2104	092/092	N/A	69	69	69	69
TE-102-AY-6	21'/SW	2105	093/093	N/A	72	72	72	73
TE-102-AY-7	21'/W	2106	094/094	N/A	67	67	67	67
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	N/A	N/A	N/A	N/A
TE-102-AY-10	21'/NE	2110	096/096	N/A	67	67	66	67
TE-102-AY-11	21'/SE	2111	097/097	N/A	66	66	66	66
TE-102-AY-12	36'/SE	2112	098/098	N/A	69	69	69	70
TE-102-AY-13	36'/SW	2113	099/099	N/A	67	67	67	68
TE-102-AY-14	36'/SW	2115	101/100	N/A	71	71	71	71
TE-102-AY-15	36'/SW	2116	102/101	N/A	68	68	68	68
TE-102-AY-16	36'/W	2117	103/102	N/A	68	68	68	69

HNF-2317

Rev 0

Page 116

6/6/98

6/7/98

INSULATING CONCRETE TEMPERATURES (Cont.)

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
					2215	0115	0415	0715
TE-102-AY-17	361/NW	2120	104/103	N/A	69	69	69	69
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	NA	NA	NA	NA
TE-102-AY-19	361/NW	2121	105/104	N/A	68	68	68	69
TE-102-AY-21	361/NE	2123	107/106	N/A	67	68	68	68
TE-102-AY-22	361/NE	2124	108/107	N/A	68	69	69	69
TE-102-AY-23	361/E	2125	109/108	N/A	67	67	68	68
TE-102-AY-24	361/SE	2126	110/109	N/A	67	67	67	67
TE-102-AY-25	361/SE	2127	111/110	N/A	69	69	69	70

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
					2215	0115	0415	0715
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	66	66	66	66
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	66	66	66	66

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F **)			
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	65	65	65	65
TE-102-AY-44	8	2146	126/125	N/A	65	65	65	65
TE-102-AY-50	16	2154	132/131	N/A	62	62	62	62
TE-102-AY-54	20	2522	362/135	N/A	65	65	65	65
TE-102-AY-59	11	2164	140/140	N/A	69	69	69	69

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

HNF-2317

Rev 0

Page 117

ATTACHMENT 5, TEMPERATURE DATA SHEET

SLUDGE TEMPERATURES					2-7-98			
THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO ¹ LIMIT	AS FOUND (°F **)			
					(Enter time at top of each column)			
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	10:15	13:15	16:15	19:15
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	09	69	69	69
TE-102-AY-71(#)	NE PROFILE (4 IN.)	2200	152/152	195°F	015	015	015	015
TE-102-AY-72(#)	SE SLUDGE (4 IN.)	2201	153/153	195°F	↓	↓	↓	↓
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	64	64	64	65

ENDNOTE: LCO¹: BIO-LCO 3.3.2, Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES					2-7-98			
THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
TE-102-AY-1	7'/SE	2100	088/088	N/A	10:15	13:15	16:15	19:15
TE-102-AY-2	7'/SW	2101	089/089	N/A	60	60	62	62
TE-102-AY-3	7'/NW	2102	090/090	N/A	59	59	60	61
TE-102-AY-4	7'/NE	2103	091/091	N/A	65	65	66	66
TE-102-AY-5	21'/SE	2104	092/092	N/A	60	59	61	62
TE-102-AY-6	21'/SW	2105	093/093	N/A	68	67	69	69
TE-102-AY-7	21'/W	2106	094/094	N/A	71	71	72	72
TE-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	65	65	66	68
TE-102-AY-10	21'/NE	2110	096/096	N/A	NA	NA	NA	NA
TE-102-AY-11	21'/SE	2111	097/097	N/A	66	65	66	67
TE-102-AY-12	36'/SE	2112	098/098	N/A	64	64	65	66
TE-102-AY-13	36'/SW	2113	099/099	N/A	68	68	69	69
TE-102-AY-14	36'/SW	2115	101/100	N/A	66	66	67	67
TE-102-AY-15	36'/SW	2116	102/101	N/A	70	70	71	71
TE-102-AY-16	36'/W	2117	103/102	N/A	67	66	67	68
					67	67	68	69

HNF-2317

Rev 0

Page 118

INSULATING CONCRETE TEMPERATURES (Cont.)

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	2-7-98 AS FOUND (°F) (Enter time at top of each column)			
					1015	1315	1615	1915
TE-102-AY-17	36°/NW	2120	104/103	N/A	67	67	68	68
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	NA	NA	NA	NA
TE-102-AY-19	36°/NW	2121	105/104	N/A	67	67	67	68
TE-102-AY-21	36°/NE	2123	107/106	N/A	66	66	67	67
TE-102-AY-22	36°/NE	2124	108/107	N/A	67	67	68	68
TE-102-AY-23	36°/E	2125	109/108	N/A	66	66	67	67
TE-102-AY-24	36°/SE	2126	110/109	N/A	66	65	67	67
TE-102-AY-25	36°/SE	2127	111/110	N/A	68	67	69	69

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	2-7-98 AS FOUND (°F) (Enter time at top of each column)			
					1015	1315	1615	1915
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	64	64	65	66
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	64	64	65	66

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	2-7-98 AS FOUND (°F **)			
					1015	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	015	015	015	015
TE-102-AY-44	8	2146	126/125	N/A	015	015	015	015
TE-102-AY-50	16	2154	132/131	N/A	65	65	62	62
TE-102-AY-54	20	2522	362/135	N/A	015	015	015	015
TE-102-AY-59	11	2164	140/140	N/A	68	68	68	69

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

HNF-2317

Rev 0

Page 119

ATTACHMENT 5, TEMPERATURE DATA SHEET

SLUDGE TEMPERATURES

2-7-98

THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO ¹ LIMIT	AS FOUND (°F **)			
					(Enter time at top of each column)			
					2015	0115	0415	0715
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	70	70	70	70
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	615	615	615	615
TE-102-AY-71(#)	NE PROFILE (4 IN.)	2200	152/152	195°F				
TE-102-AY-72(#)	SE SLUDGE (4 IN.)	2201	153/153	195°F				
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	65	65	65	65

ENDNOTE: LCO¹: BIO-LCO 3.3.2, Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
					2015	0115	0415	0715
TE-102-AY-1	7'/SE	2100	088/088	N/A	63	62	62	62
TE-102-AY-2	7'/SW	2101	089/089	N/A	61	61	61	61
TE-102-AY-3	7'/NW	2102	090/090	N/A	66	66	66	66
TE-102-AY-4	7'/NE	2103	091/091	N/A	62	62	62	62
TE-102-AY-5	21'/SE	2104	092/092	N/A	69	69	69	69
TE-102-AY-6	21'/SW	2105	093/093	N/A	72	72	73	72
TE-102-AY-7	21'/W	2106	094/094	N/A	67	67	67	67
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	NA	NA	NA	NA
TE-102-AY-10	21'/NE	2110	096/096	N/A	67	68	67	67
TE-102-AY-11	21'/SE	2111	097/097	N/A	66	66	66	66
TE-102-AY-12	36'/SE	2112	098/098	N/A	70	70	70	70
TE-102-AY-13	36'/SW	2113	099/099	N/A	68	68	68	68
TE-102-AY-14	36'/SW	2115	101/100	N/A	71	71	71	72
TE-102-AY-15	36'/SW	2116	102/101	N/A	68	68	68	68
TE-102-AY-16	36'/W	2117	103/102	N/A	69	69	69	68

HNF-2317

Rev 0

Page 120

INSULATING CONCRETE TEMPERATURES (Cont.) 2/7/98

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					2015	0115	0415	0715
TE-102-AY-17	36'/NW	2120	104/103	N/A	69	69	69	69
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	NA	NA	NA	NA
TE-102-AY-19	36'/NW	2121	105/104	N/A	69	69	69	69
TE-102-AY-21	36'/NE	2123	107/106	N/A	68	68	68	68
TE-102-AY-22	36'/NE	2124	108/107	N/A	68	69	69	69
TE-102-AY-23	36'/E	2125	109/108	N/A	67	68	68	68
TE-102-AY-24	36'/SE	2126	110/109	N/A	67	67	68	67
TE-102-AY-25	36'/SE	2127	111/110	N/A	69	68	70	69

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					2015	0115	0415	0715
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	66	66	66	66
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	66	66	65	66

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F **)			
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	015	016	015	015
TE-102-AY-44	8	2146	126/125	N/A	019	019	015	015
TE-102-AY-50	16	2154	132/131	N/A	62	63	63	63
TE-102-AY-54	20	2522	362/135	N/A	015	019	019	015
TE-102-AY-59	11	2164	140/140	N/A	69	69	69	69

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

ATTACHMENT 5, TEMPERATURE DATA SHEET

SLUDGE TEMPERATURES 2-0-98

THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO ¹ LIMIT	AS FOUND (°F **)			
					(Enter time at top of each column)			
					1015	1315	1615	1915
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	69	70	70	70
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	015	015	015	015
TE-102-AY-71(#)	NE PROFILE (4 IN.)	2200	152/152	195°F	↓	015	015	015
TE-102-AY-72(#)	SE SLUDGE (4 IN.)	2201	153/153	195°F	↓	015	015	015
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	65	65	65	66

ENDNOTE: LCO¹: BIO-LCO 3.3.2, Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES 2-8-98

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
					1015	1315	1615	1915
TE-102-AY-1	7' SE	2100	088/088	N/A	61	61	62	62
TE-102-AY-2	7' SW	2101	089/089	N/A	60	60	61	61
TE-102-AY-3	7' NW	2102	090/090	N/A	66	66	66	66
TE-102-AY-4	7' NE	2103	091/091	N/A	61	61	62	63
TE-102-AY-5	21' SE	2104	092/092	N/A	68	68	68	69
TE-102-AY-6	21' SW	2105	093/093	N/A	72	72	72	72
TE-102-AY-7	21' W	2106	094/094	N/A	66	67	67	67
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	65	N/A	N/A	N/A
TE-102-AY-10	21' NE	2110	096/096	N/A	66	66	67	67
TE-102-AY-11	21' SE	2111	097/097	N/A	65	66	66	66
TE-102-AY-12	36' SE	2112	098/098	N/A	69	69	69	69
TE-102-AY-13	36' SW	2113	099/099	N/A	67	67	67	67
TE-102-AY-14	36' SW	2115	101/100	N/A	71	70	71	71
TE-102-AY-15	36' SW	2116	102/101	N/A	67	67	68	68
TE-102-AY-16	36' W	2117	103/102	N/A	68	68	68	68

HNF-2317

Rev 0

Page 122

INSULATING CONCRETE TEMPERATURES (Cont.) 2-8-98

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					1015	1315	1615	1915
TE-102-AY-17	36°/NW	2120	104/103	N/A	68	68	68	68
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	NA	NA	NA	NA
TE-102-AY-19	36°/NW	2121	105/104	N/A	68	68	68	68
TE-102-AY-21	36°/NE	2123	107/106	N/A	67	67	67	67
TE-102-AY-22	36°/NE	2124	108/107	N/A	68	68	68	68
TE-102-AY-23	36°/E	2125	109/108	N/A	67	67	67	67
TE-102-AY-24	36°/SE	2126	110/109	N/A	67	67	67	67
TE-102-AY-25	36°/SE	2127	111/110	N/A	68	68	68	68

TANK KNUCKLE TEMPERATURE 2-8-98

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					1015	1315	1615	1915
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	65	65	65	66
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	65	65	66	66

AIRLIFT CIRCULATOR TEMPERATURES 2-8-98

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F **)			
					1015 TIME	1315 TIME	1615 TIME	1915 TIME
TE-102-AY-42	6	2144	124/123	N/A	015	015	015	015
TE-102-AY-44	8	2146	126/125	N/A	015	015	015	015
TE-102-AY-50	16	2154	132/131	N/A	62	62	63	62
TE-102-AY-54	20	2522	362/135	N/A	015	015	015	015
TE-102-AY-59	11	2164	140/140	N/A	68	69	69	69

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

HNF-2317

Rev 0

Page 123

ATTACHMENT 5, TEMPERATURE DATA SHEET

SLUDGE TEMPERATURES						2-9-98			
THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO ¹ LIMIT	AS FOUND (°F **)				
					(Enter time at top of each column)				
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	2215	0115	0415	0715	
TE-102-AY-68(8)	NW PROFILE (4 IN.)	2175	149/149	195°F	20	20	20	70	
TE-102-AY-71(8)	NE PROFILE (4 IN.)	2200	152/152	195°F	09	015	015	015	
TE-102-AY-72(8)	SE SLUDGE (4 IN.)	2201	153/153	195°F	09	015	015	015	
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	65	65	65	65	

ENDNOTE: LCO¹: BIO-LCO 3.3.2, Waste Temperature
 (*) Known Out Of Service Thermocouples Removed From Data Sheet.
 (#) May be out of service.
 (**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES								
THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
TE-102-AY-1	7' SE	2100	088/088	N/A	2215	0115	0415	0715
TE-102-AY-2	7' SW	2101	089/089	N/A	62	62	62	62
TE-102-AY-3	7' NW	2102	090/090	N/A	61	61	61	60
TE-102-AY-4	7' NE	2103	091/091	N/A	66	66	66	66
TE-102-AY-5	21' SE	2104	092/092	N/A	62	62	62	61
TE-102-AY-6	21' SW	2105	093/093	N/A	69	69	69	69
TE-102-AY-7	21' W	2106	094/094	N/A	72	72	72	72
TE-102-AY-7	21' W	2106	094/094	N/A	67	67	67	66
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	NA	NA	NA	NA
TE-102-AY-10	21' NE	2110	096/096	N/A	67	67	67	67
TE-102-AY-11	21' SE	2111	097/097	N/A	66	66	66	66
TE-102-AY-12	36' SE	2112	098/098	N/A	69	70	70	69
TE-102-AY-13	36' SW	2113	099/099	N/A	68	67	68	67
TE-102-AY-14	36' SW	2115	101/100	N/A	71	71	71	71
TE-102-AY-15	36' SW	2116	102/101	N/A	68	68	68	68
TE-102-AY-16	36' W	2117	103/102	N/A	68	68	68	68

HNF-2317
 Rev 0
 Page 124

INSULATING CONCRETE TEMPERATURES (Cont.)

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					2215	0115	0415	0715
TE-102-AY-17	36'/NW	2120	104/103	N/A	69	68	69	69
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	NA	NA	NA	NA
TE-102-AY-19	36'/NW	2121	105/104	N/A	68	68	69	68
TE-102-AY-21	36'/NE	2123	107/106	N/A	67	67	68	67
TE-102-AY-22	36'/NE	2124	108/107	N/A	68	69	69	68
TE-102-AY-23	36'/E	2125	109/108	N/A	67	68	68	67
TE-102-AY-24	36'/SE	2126	110/109	N/A	72	67	67	67
TE-102-AY-25	36'/SE	2127	111/110	N/A	69	69	69	69

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					2215	0115	0415	0715
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	66	66	66	66
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	66	66	66	66

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F **)			
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	05	05	05	05
TE-102-AY-44	8	2146	126/125	N/A	05	05	05	05
TE-102-AY-50	16	2154	132/131	N/A	62	62	62	62
TE-102-AY-54	20	2522	362/135	N/A	05	05	05	05
TE-102-AY-59	11	2164	140/140	N/A	69	69	69	69

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

HNF-2317

Rev 0

Page 125

Start 2/4/98

ATTACHMENT 5, TEMPERATURE DATA SHEET

SLUDGE TEMPERATURES								
THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO ¹ LIMIT	AS FOUND (°F **)			
					(Enter time at top of each column)			
					10:15	13:15	16:15	19:15
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	69	68	68	70
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	9/5	9/5	9/5	9/5
TE-102-AY-71(#)	NE PROFILE (4 IN.)	2200	152/152	195°F	9/5	9/5	9/5	9/5
TE-102-AY-72(#)	SE SLUDGE (4 IN.)	2201	153/153	195°F	9/5	9/5	9/5	9/5
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	64	64	65	65

ENDNOTE: LCO¹: BIO-LCO 3.3.2, Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES								
THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
					1015	1315	1615	1915
TE-102-AY-1	7'/SE	2100	088/088	N/A	60	60	62	63
TE-102-AY-2	7'/SW	2101	089/089	N/A	60	39	60	62
TE-102-AY-3	7'/NW	2102	090/090	N/A	65	65	65	66
TE-102-AY-4	7'/NE	2103	091/091	N/A	60	60	61	62
TE-102-AY-5	21'/SE	2104	092/092	N/A	68	67	67	69
TE-102-AY-6	21'/SW	2105	093/093	N/A	71	70	71	72
TE-102-AY-7	21'/W	2106	094/094	N/A	64	66	66	67
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	N/A			7
TE-102-AY-10	21'/NE	2110	096/096	N/A	63	65	66	67
TE-102-AY-11	21'/SE	2111	097/097	N/A	63	64	65	7804
TE-102-AY-12	36'/SE	2112	098/098	N/A	66	66	68	69
TE-102-AY-13	36'/SW	2113	099/099	N/A	64	66	67	68
TE-102-AY-14	36'/SW	2115	101/100	N/A	68	69	70	71
TE-102-AY-15	36'/SW	2116	102/101	N/A	65	66	67	68
TE-102-AY-16	36'/W	2117	103/102	N/A	65	67	67	68

HNF-2317

Rev 0

Page 126

Start 2/9/94

INSULATING CONCRETE TEMPERATURES (Cont.)

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
					2-9-98 10:5	1315	1615	1915
TE-102-AY-17	36°/NW	2120	104/103	N/A	66	67	67	68
TE-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	NA			
TE-102-AY-19	36°/NW	2121	105/104	N/A	67	67	68	68
TE-102-AY-21	36°/NE	2123	107/106	N/A	66	66	67	67
TE-102-AY-22	36°/NE	2124	108/107	N/A	68	67	67	68
TE-102-AY-23	36°/E	2125	109/108	N/A	66	66	66	67
TE-102-AY-24	36°/SE	2126	110/109	N/A	66	66	66	67
TE-102-AY-25	36°/SE	2127	111/110	N/A	68	68	68	69

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
					10:5	1315	1615	1915
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	64	64	65	66
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	65	64	65	66

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F **)			
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	0/5	0/5	0/1	0/5
TE-102-AY-44	8	2146	126/125	N/A	0/5	0/5	0/1	0/5
TE-102-AY-50	16	2154	132/131	N/A	61	60	61	62
TE-102-AY-54	20	2522	362/135	N/A	0/5	0/5	0/1	0/5
TE-102-AY-59	11	2164	140/140	N/A	68	68	68	69

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

2-9-98

ATTACHMENT 5, TEMPERATURE DATA SHEET

SLUDGE TEMPERATURES					2-10-98			
THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO ¹ LIMIT	AS FOUND (°F **)			
					(Enter time at top of each column)			
					2215	0115	0415	0715
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	70	76	70	69
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	68	68	68	68
TE-102-AY-71(#)	NE PROFILE (4 IN.)	2200	152/152	195°F	68	68	68	68
TE-102-AY-72(#)	SE SLUDGE (4 IN.)	2201	153/153	195°F	68	68	68	68
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	66	66	65	65

ENDNOTE: LCO¹: BIO-LCO 3.3.2, Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES								
THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
					2215	0115	0415	0715
TE-102-AY-1	7'/SE	2100	088/088	N/A	62	62	61	61
TE-102-AY-2	7'/SW	2101	089/089	N/A	61	61	60	60
TE-102-AY-3	7'/NW	2102	090/090	N/A	66	66	66	65
TE-102-AY-4	7'/NE	2103	091/091	N/A	62	62	61	61
TE-102-AY-5	21'/SE	2104	092/092	N/A	69	70	68	68
TE-102-AY-6	21'/SW	2105	093/093	N/A	72	72	72	72
TE-102-AY-7	21'/W	2106	094/094	N/A	67	67	67	66
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	N/A	N/A	N/A	N/A
TE-102-AY-10	21'/NE	2110	096/096	N/A	67	67	67	67
TE-102-AY-11	21'/SE	2111	097/097	N/A	66	66	66	66
TE-102-AY-12	36'/SE	2112	098/098	N/A	70	70	69	69
TE-102-AY-13	36'/SW	2113	099/099	N/A	68	68	67	67
TE-102-AY-14	36'/SW	2115	101/100	N/A	71	71	71	71
TE-102-AY-15	36'/SW	2116	102/101	N/A	68	68	68	68
TE-102-AY-16	36'/W	2117	103/102	N/A	68	68	68	68

HNF-2317

Rev 0

Page 128

2-9-98

INSULATING CONCRETE TEMPERATURES (Cont.)

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					2215	0115	0415	0715
TE-102-AY-17	36°/NW	2120	104/103	N/A	69	69	69	68
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	NA			
TE-102-AY-19	36°/NW	2121	105/104	N/A	68	68	68	68
TE-102-AY-21	36°/NE	2123	107/106	N/A	67	67	67	67
TE-102-AY-22	36°/NE	2124	108/107	N/A	68	68	68	68
TE-102-AY-23	36°/E	2125	109/108	N/A	67	67	67	67
TE-102-AY-24	36°/SE	2126	110/109	N/A	67	67	67	67
TE-102-AY-25	36°/SE	2127	111/110	N/A	69	69	69	69

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					2215	0115	0415	0715
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	65	66	66	66
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	66	66	66	65

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F **)			
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	0115	0115	0215	0715
TE-102-AY-44	8	2146	126/125	N/A	0115	0115	0215	0715
TE-102-AY-50	16	2154	132/131	N/A	62	62	62	62
TE-102-AY-54	20	2522	362/135	N/A	0115	0115	0215	0715
TE-102-AY-59	11	2164	140/140	N/A	69	69	69	69

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

HNF-2317

Rev 0

Page 129

ATTACHMENT 5, TEMPERATURE DATA SHEET

SLUDGE TEMPERATURES					
THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LC0 ¹ LIMIT	2-10-98 AS FOUND (°F **) (Enter time at top of each column)
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F	1015 1315
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F	69 69
TE-102-AY-71(#)	NE PROFILE (4 IN.)	2200	152/152	195°F	015 015
TE-102-AY-72(#)	SE SLUDGE (4 IN.)	2201	153/153	195°F	015 015
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F	64 66

ENDNOTE: LC0¹: BIO-LCO 3.3.2, Waste Temperature
 (*) Known Out Of Service Thermocouples Removed From Data Sheet.
 (#) May be out of service.
 (**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES					
THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	2-10-98 AS FOUND (°F) (Enter time at top of each column)
TE-102-AY-1	7'/SE	2100	088/088	N/A	1015 1015
TE-102-AY-2	7'/SW	2101	089/089	N/A	60 60
TE-102-AY-3	7'/NW	2102	090/090	N/A	59 59
TE-102-AY-4	7'/NE	2103	091/091	N/A	65 64
TE-102-AY-5	21'/SE	2104	092/092	N/A	60 60
TE-102-AY-6	21'/SW	2105	093/093	N/A	68 67
TE-102-AY-7	21'/W	2106	094/094	N/A	71 71
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	66 65
TE-102-AY-10	21'/NE	2110	096/096	N/A	NA NA
TE-102-AY-11	21'/SE	2111	097/097	N/A	66 66
TE-102-AY-12	36'/SE	2112	098/098	N/A	65 65
TE-102-AY-13	36'/SW	2113	099/099	N/A	68 68
TE-102-AY-14	36'/SW	2115	101/100	N/A	67 66
TE-102-AY-15	36'/SW	2116	102/101	N/A	70 70
TE-102-AY-16	36'/W	2117	103/102	N/A	67 67
					68 68

INSULATING CONCRETE TEMPERATURES (Cont.)

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	2-10-78 AS FOUND (°F) (Enter time at top of each column)			
					1015	1315		
TE-102-AY-17	36°/NW	2120	104/103	N/A	68	68		
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A	NA	NA		
TE-102-AY-19	36°/NW	2121	105/104	N/A	68	68		
TE-102-AY-21	36°/NE	2123	107/106	N/A	67	66		
TE-102-AY-22	36°/NE	2124	108/107	N/A	68	68		
TE-102-AY-23	36°/E	2125	109/108	N/A	67	67		
TE-102-AY-24	36°/SE	2126	110/109	N/A	66	66		
TE-102-AY-25	36°/SE	2127	111/110	N/A	68	68		

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F) (Enter time at top of each column)			
					1015	1315		
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A	65	65		
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A	65	65		

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	2-10-78 AS FOUND (°F **)			
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A	013	015		
TE-102-AY-44	8	2146	126/125	N/A	013	015		
TE-102-AY-50	16	2154	132/131	N/A	62	61		
TE-102-AY-54	20	2522	362/135	N/A	013	015		
TE-102-AY-59	11	2164	140/140	N/A	68	68		

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

HNF-2317

Rev 0

Page 131

PROCEDURE HISTORY SIGNATURE SHEET

Last Full Revision: A-0

Release Date: 1/19/98

USQ Screening Number: TF-97-1005

Approval Designator: ESQ

POSITION/ORG	DELEGATE	DATE
NPO	<u>R. Garcia</u>	<u>1/19/98</u>
DST Shift Manager	<u>K.J. Anderson</u>	<u>1/19/98</u>
QA Engineer	<u>C.A. Sams</u>	<u>1/16/98</u>
Safety Engineer	<u>S.U. Zaman</u>	<u>1/15/98</u>
Environmental Eng.	<u>P.C. Miller</u>	<u>1/16/98</u>
RadCon Engineer	<u>J. Pieper</u>	<u>1/16/98</u>
COG Engineer	<u>J.M. Jones</u>	<u>1/16/98</u>
Design Authority	<u>W.J. Powell</u>	<u>1/19/98</u>
Acceptance Review	<u>D.C. Ashworth</u>	<u>1/19/98</u>
Approval Authority	<u>R.A. Dodd</u>	<u>1/19/98</u>

Justification: To test W-320 changes to 241-AY-102 ventilation system

Summary of Changes: New procedure

HN-2317

Rev 0

Page 134

Type	Document No.	Rev/Mod	Rel
CONTINUOUS	OTP-320-001	A-3	

PROCEDURE HISTORY SIGNATURE SHEET (Cont.)

Last Full Revision: A-0

Release Date: 1/19/98

USQ Screening Number: TF-97-1005

Approval Designator: ESQ

Current Modification: A-1

USQ Screening Number: TF-97-1005, Rev. 2

Approval Designator: SQ

PCA Incorporated: ETF-98-055

POSITION/ORG	DELEGATE	DATE
NPO	<u>D.R. Jones</u>	<u>1/23/98</u>
Shift Manager	<u>J.E. Andrews</u>	<u>1/23/98</u>
QA Engineer	<u>W.L. Adams</u>	<u>1/23/98</u>
Safety Engineer	<u>S.U. Zaman</u>	<u>1/23/98</u>
Design Authority	<u>W.J. Powell</u>	<u>1/23/98</u>
RadCon Engineer	<u>J. Pieper</u>	<u>1/23/98</u>
COG Engineer	<u>J.M. Jones</u>	<u>1/23/98</u>
Acceptance Review	<u>D.C. Ashworth</u>	<u>1/23/98</u>
Approval Authority	<u>J.E. Andrews</u>	<u>1/23/98</u>

Justification: COG Engineer request

Summary of Changes:

Changed maximum test vacuum from -14" to -19" wg.

Changed maximum allowable CAM value from 550 cpm to alarm.

Added steps to route user to proper actions for high CAM readings.

Added conditional step 5.4.6 to allow continued testing.

Changed PI-K2-2-1 to PI-K2-1-2

Changed allowable range for PI-AY-102 from -14" to to -19" and CAM-102-AY from 550 cpm to 2000 cpm.

HNFF-2317

Rev 0

Page 135

Type

Document No.

Rev/Mod

CONTINUOUS

OTP-320-001

A-3

PROCEDURE HISTORY SIGNATURE SHEET (Cont.)

Last Full Revision: A-0
 Release Date: 1/19/98
 USQ Screening Number: TF-97-1005
 Approval Designator: ESQ

Current Modification: A-2
 USQ Screening Number: TF-97-1005
 Approval Designator: N/A
 PCA Incorporated: ETF-98-056

POSITION/ORG	DELEGATE	DATE
NPO	<u>T.M. Fish</u>	<u>1/26/98</u>
Shift Manager	<u>K.J. Anderson</u>	<u>1/26/98</u>
Design Authority	<u>W.J. Powell</u>	<u>1/26/98</u>
COG Engineer	<u>J.M. Jones</u>	<u>1/26/98</u>
Acceptance Review	<u>D.C. Ashworth</u>	<u>1/26/98</u>
Approval Authority	<u>K.J. Anderson</u>	<u>1/26/98</u>

Justification: COG Engineer request

Summary of Changes:
 Added substep 5.2.1.1 and re-worded step 5.2.1 to allow use/adjustment of radial inlet damper to stabilize flow.

HNF-2317
 Rev 0
 Page 136

APPENDIX A

STRUCTURAL ASSESSMENT

SESC

SGN Eurisys Services Corporation
An SGN/Cogema, Inc. Company

EDT 622181
Line Item #1
Page 1 of 23
Total Pages: 23

January 20, 1998

SESC-98-027
Rev. 1

J. W. Lentsch, Project Manager
Waste Disposal
Numatec Hanford Corporation
Post Office Box 1300 S2-48
Richland, WA 99352

Dear Mr. Lentsch:

STRUCTURAL EVALUATION OF SECONDARY LINER IN 241-AY-102 TANK ANNULUS AND DUCT SUBJECT TO 20 INCH NEGATIVE PRESSURE

The application of a maximum minus 20-inches water gage pressure (vacuum) on the annulus space of 241-AY-102 tank using the annulus ventilation system is acceptable. The attached calculations demonstrate the adequacy of the tank liner with a minimum safety factor of 7.5 against buckling and 6.9 against allowable stress of the liner.

The increased negative pressure from the annulus is necessary to achieve the differential pressure required to produce the airflow through the annulus distribution plenum under the waste tanks and up the annular space for cooling. If use of the existing annulus exhaust fan cannot produce the required flow rate, the use of a pusher blower may be required. With the use of an additional pushing blower on the inlet, failure of the annulus exhaust fan would result in a positive pressure on the annulus which would result in an increased pressure differential on the primary tank shell. To preclude this increased pressure differential that could buckle the primary shell, there should be a shutdown of the pressurizing side of the system (if used) to preclude increasing the annular pressure above atmospheric or greater than the limits imposed by HNF-1838, "Assessment of Project W-030 Relief Valve Pressure Setting on Internal Vacuum Specification Limits for AY and AZ Tank Farm Primary Tanks," dated November, 1997. The primary shell should not have internal positive pressures that exceed a net 60-inches accounting for the vacuum in the annulus.

Review of the original heater housing H-2-77326, for the same negative pressures appeared to be marginal from the guidelines outlined in Table 2A, Sheet Metal and Air Conditioning Contractors National Association (SMACNA) manual 15d, Accepted Industry Practice for Industrial Duct Construction. This section was rebuilt (Dwg H-2-92481, Sht 2) with duct wall thicknesses of 14 gage with 1-1/2" x 1-1/2" x 1/4" angle reinforcements in the corners. This exceeds the recommended guidelines and will be adequate at the applied vacuum of -20 inches water gage.

HNF-2317
Rev 0
Page A-2

Mr. J. W. Lentsch
Page 2
January 20, 1998

EDT 622181
Line Item #1
Page 2 of 23
Total Pages: 23

SESC-98-027
Rev. 1

The 16-inch diameter round duct is 10 gage material and by the same SMACNA Manual Table 1A is good for -20-inches water gage with reinforcement spacing less than 8 feet on center.

The balance of the duct-work in this system is specified to comply with design pressures of +60 to -20 inches water gage in the new construction specification B-672-C2, "Construction Specification for AY-102 Annulus Vent Upgrade Piping with Cathodic Protection". The filter housing is addressed in WHC-S-0434, "Specification for Vendor Services and Parts Required to Support the Replacement of Annulus Exhaust HEPA Assemblies K1-5-1/K1-5-2 and K2-5-1/K2-5-2", Section 3.3.1.5 with a design negative or positive pressure of 20-inches water gage. The exhaust duct is connected to the exhaust fan with a rubber boot or bellows. This connection was demonstrated to be adequate for -20 inches water gage by the specification of the flexible ducting in "Specification for Vendor Services and Parts Required to Support the Replacement of Fans K1-3-2 and K2-3-2, annulus Vent Fans, Located in 241-AY Tank Farm," Section 3.4.7.1.A. Included with this specification was a vendor specification sheet 942 U with telecon noting the joint was designed to negative or positive pressure of 1 pound per square inch which is the equivalent of +/-28 inches water gage.

The AY-102 leak detection pit will be subject to the same -20 inches water gage which is the equivalent of 100 pounds per square foot. By inspection of drawings H-2-64317, H-2-64318, H-2-64319, H-2-64424 and H-2-64430, the negative pressure on the side walls and top of the sump of the leak detection pit increases the initial soil load pressure by less than 2 percent at a depth of fifty feet. By engineering judgement, this small increase in load is acceptable. Neglecting the offsetting gravity load of the bottom plate, the combined bending and axial stress has a safety factor of 1.0 to the allowable stress.

Because there are limited specifications for the inlet filter housing, a structural evaluation could not be completed. To preclude exposing the filter housing to high negative pressures, the inlet storm shutter (MK-6301) must be locked in an open position.

Should you have any additional questions related to this analysis, please contact me at 376-5152.

Sincerely,

Mark A. Scott, P.E., SE
Senior Engineer

kld

Attachment

HNF-2317
Rev 0
Page A-3

ATTACHMENT

STRUCTURAL EVALUATION OF 241-AY-102

TANK ANNULUS SUBJECT TO
20-INCH NEGATIVE PRESSURE

Letter Number

SESC-98-027

Rev. 1

Page 1 of 9

HNF-2317
Rev 0
Page A-4

DESIGN CALCULATION

(1) Drawing _____ (2) Doc. No. SSC-08-027 (3) Page 2 of 9
(4) Building 241-AY-102 (5) Rev. 1 (6) Job No. _____
(7) Subject ANNULUS VACUUM EVALUATION
(8) Originator MARLA A SCOTT Date 1-14-98
(9) Checker L.J. JULYK Date 1/15/98

(10)

THE ANNULUS SPACE IN 241-AY-102 WILL BE SUBJECTED TO A -20 IN WATER GAGE PRESSURE (VACUUM) DURING OPERATION. THIS ANALYSIS WILL EVALUATE THE SECONDARY LINER.

THE SECONDARY LINER AS SHOWN IN DRAWING H-2-64449 IS A $\frac{1}{4}$ INCH THICK CARBON STEEL PLATE. THE LINER WAS UTILIZED AS FORMWORK FOR THE PLACEMENT OF THE STRUCTURAL CONCRETE. THE SIDE OF THE LINER NEXT TO THE CONCRETE WAS RESTRAINED BY FORM TIES THAT ATTACHED TO STUDS WELDED TO THE LINER ON 2 FOOT CENTERS (DETAIL B, H-2-64449 AND NOTE 4 ON H-2-64447). THE STUDS WERE DRILLED AND TAPPED FOR $\frac{1}{4}$ " ϕ UNC 20 THREADS. THERE ARE NO DIRECT CODE APPLICATIONS FOR THIS TYPE OF CONFIGURATION. THE LINER WILL THEN BE ANALYZED FOR BUCKLING STABILITY AND THE ANCHORS FOR LOAD CAPACITY TO RESIST THE APPLIED NEGATIVE PRESSURE.

HNF-2317
Rev 0
Page A-5

DESIGN CALCULATION

EDT 622181
Line Item #1
Page 5 of 23
Total Pages: 23

(1) Drawing _____ (2) Doc. No. SSC-98-022 (3) Page 3 of 9
 (4) Building 241-AF-102 (5) Rev. 1 (6) Job No. _____
 (7) Subject ANNULUS VACUUM EVALUATION
 (8) Originator MARK A SCOTT Date 1-14-98
 (9) Checker L. J. JULY Date 1/15/98

(10)

THE LOAD CAPACITY OF THE STUD IS LIMITED BY THE FORM TIE CONNECTION TO THE $\frac{1}{4}"$ UNC-20 THREADED CONNECTION. ASSUMING A MINIMUM A307 BOLTING MATERIAL AT THE THREAD ROOT CROSS SECTIONAL AREA, THE ALLOWABLE LOAD IS:

$$P_{ALLOW} = (F_t)(A) = .636 \text{ kps} = 636 \text{ LB}$$

$$F_t = 20 \text{ ksi (AISC B7H ED) A 307}$$

$$A = .0318 \text{ in}^2 \text{ (MACHINE'S HUBB 25th ED TABLE 3g PAGE 1640)}$$

THE MAXIMUM APPLIED LOAD IS:

$$P_{MAX} = 20 \text{ in} \times \frac{62.4}{1728} \times 24 \text{ in} \times 24 \text{ in} = 416 \text{ LB}$$

$$636 > 416$$

OK

THE LINER BEING RESTRAINED LOCALLY BY THE CONCRETE ANCHORS IS SUBJECT TO BUCKLING UNDER NEGATIVE PRESSURE. THE BEST REPRESENTATION OF THE BOUNDARY CONDITIONS OF THIS CONFIGURATION IS FOUND IN STRENGTH OF MATERIALS, PART II, TIMOSHENKO, FIG 121. THE END CONSTRAINTS ARE AT THE ANCHOR SPACING OF 24 INCHES.

DESIGN CALCULATION

EDT 622181
Line Item #1
Page 6 of 23
Total Pages: 23

(1) Drawing _____ (2) Doc. No. SPSC-78-022 (3) Page 4 of 9
(4) Building 241-AV-102 (5) Rev. 1 (6) Job No. _____
(7) Subject ANNULUS VACUUM EVALUATION
(8) Originator MARK A. SCOTT Date 1-14-93
(9) Checker L.J. JULE Date 1/15/93

FIG. 121.

$$q_{cr} = \frac{EI}{R^3} \left(\frac{4\pi^2}{\alpha^2} - 1 \right) \quad (157)$$

STRENGTH OF MATERIALS
PART II, ADVANCED THEORY
AND PROBLEMS, 3RD ED.
S. TIMOSHENKO
VAN NOSTRAND

$$E = 29 \times 10^6 \text{ PSI}$$

$$I = \frac{1'' \times h^3}{12} = .0013$$

$$h = \text{thickness} = .25 \text{ in}$$

$$R = 40 \text{ ft} = 480 \text{ in}$$

$$\alpha = \frac{24''}{2(480)\pi} (2\pi) = .05 \text{ RAD}$$

$$q_{cr} = \frac{29 \times 10^6 (.0013)}{480^3} \left(\frac{4\pi^2}{(.05)^2} - 1 \right) \frac{\text{LB/IN}^2 \cdot \text{IN}^4}{\text{IN}^3}$$

= 5.38 lb/in. LOAD ALONG A 1 INCH WIDE STRIP. THIS CORRELATES TO A SURFACE PRESSURE OF 5.38 psi

THE EQUIVALENT WATER GAGE PRESSURE IS:

$$P_{cr} = 5.38 \text{ psi} \frac{1728}{62.4} = 150 \text{ INCHES W.G.}$$

$$SF = \frac{150}{20} = 7.5$$

THE MAXIMUM CIRCUMFERENTIAL STRESS IS:

$$\sigma = \frac{PR}{t} = \frac{20 \left(\frac{62.4}{1728} \right) 480}{.25} = 1387 \text{ psi}$$

HNF-2317
Rev 0
Page A-7

DESIGN CALCULATION

EDT 622181
Line Item #1
Page 7 of 23
Total Pages: 23

(1) Drawing _____ (2) Doc. No. 58X-98-027 (3) Page 5 of 9
(4) Building 241-AY-102 (5) Rev. 1 (6) Job No. _____
(7) Subject ANNULUS VACUUM EVALUATION
(8) Originator MAUR A SCOTT Date 1-14-98
(9) Checker L.J. JULY Date 1/15/98

(10)

THE SECONDARY LINER WAS SPECIFIED
IN HWS-7789 AS ASTM AISI GRADE 60.
THE ALLOWABLE STRESS IS THEN:

$$\sigma_{allow} = .6 F_y = .6(60) = 36 \text{ ksi}$$

THE RESULTING SAFETY FACTOR IS THEN:

$$SF = \frac{36000}{1397} = 26$$

THE ROOF OF THE SECONDARY TANK IS
ALSO ANCHORED IN THE SAME MANNER
AS THE SIDE WALLS. WITH THE DOUBLE
CURVED SURFACE, BY OBSERVATION, THE
BUCKLING IS BOUNDED BY THE SINGLE
CURVATURE CALCULATION. THE DOUBLE
CURVATURE WILL HAVE A HIGHER BUCKLING
LIMIT.

THE FLOOR OF THE SECONDARY LINER
CAN BE SIMPLY EVALUATED AS A FIXED
END BEAM FROM THE RING AT THE
EDGE OF THE REFRACTORY CONCRETE
TO THE TANK WALL. THE RESULTING
MAXIMUM STRESS IS THEN:

$$\sigma_b = \frac{M}{S} = \frac{w l^2 / 12}{b t^2 / 6} = \frac{5415}{.0104} = 5198 \text{ psi}$$

$$b = 1" \\ t = .25"$$

$$w = 20 \left(\frac{62.4}{1728} \right) = .72 \text{ psi}$$

$$l = 2'-6" = 30"$$

HNF-2317
Rev 0
Page A-8

DESIGN CALCULATION

EDT 622181
Line Item #1
Page 8 of 23
Total Pages: 23

(1) Drawing _____ (2) Doc. No. SSC-98-027 (3) Page 6 of 7
(4) Building 241-A7-102 (5) Rev. 1 (6) Job No. _____
(7) Subject ANNULUS VACUUM EVALUATION
(8) Originator MARV A SCOTT MEX Date 1-14-98
(9) Checker L.T. JULY 1/15/98 Date 1/15/98

(10)

THE RESULTING SAFETY FACTOR IS THEN:

$$SF = \frac{36000}{5198} = 6.9$$

DESIGN CALCULATION

(1) Drawing 241-AT-102 (5) Rev. 1 (6) Job No. NH004E (2) Doc No. 355G-98-027 (3) Page 7 of 9
(7) Subject Leak Detection FT Negative Pressure Blowing
(8) Originator Mark A. Scott Date 1-20-98
(9) Checker T. Stundahl Date 1-20-98

(10)

Evaluate the leak detection pit for all internal negative pressure of -20 inches water gauge. The bottom plate is 1/2 inch thick with a four foot diameter area exposed to the negative pressure. The external soil load does not act on the outer surface because of the concrete foundation pad and the top surface soil load on the annular ring is transmitted to the foundation slab through the tank side walls. Assuming the plate edges fixed, "FORMULAS FOR STRESS AND STRAIN", Rankine, 5th Edition, Table 24, Case 10b

$$M_{ra} = -\frac{q}{8} (a^2 - b^2)^2$$

$$f_{ra} = 0$$

$$M_{rb} = -\frac{q}{8} a^2 = 52 \text{ in.-lb}$$

$$q = .722 \text{ psi (} \sim 20 \text{ inches)}$$

$$a = 24 \text{ in}$$

$$\Delta_r = 6M/r^2 = \frac{52(6)}{24^2} = 1248 \text{ psi}$$

Assuming the plate edges simply supported, use

$$M_c = 9q^2(3+2\nu) = 85.8$$

$$\nu = .3$$

$$\Delta_c = 6M/r^2 = \frac{85.8(6)}{24^2} = 2059 \text{ psi}$$

DESIGN CALCULATION

EDT 622181
Line Item #1
Page 10 of 23
Total Pages: 23

(1) Drawing _____ (2) Doc. No. 502-98-027 (3) Page 0 of 9
(4) Building 241-AY-102 (5) Rev. 1 (6) Job No. NH004E
(7) Subject Low Detection Pot Negative Pressure Evaluation
(8) Originator Mark A. Scott Date 1-20-98
(9) Checker J. Stundel Date 1-20-98

(10) PLATE ANALYSIS CONT.

THE EDGES OF THE $\frac{1}{2}$ " PLATE ARE SUBJECTED TO AN EDGE COMPRESSION SOIL LOAD ON THE 1'-6" RING AROUND THE PERIMETER. THIS EDGE LOAD SHOULD BE CHECKED FOR CRITICAL BUCKLING OF THE PLATE AND THE ADDITIONAL MID-PLATE BENDING MOMENT DUE TO THE EDGE LOAD TIMES THE ECCENTRIC MID SPAN DEFLECTION DUE TO THE NEGATIVE PRESSURE. THE PRESSURE IS

THEN: (DWG H-2-64317 PLATE ELEVATION = 615.17')
(DWG H-2-64318 SOIL SURF. ELEV = 679.0')

$$P_{\text{SOIL}} = (679.0 - 615.17) \left(\frac{115 \text{ LB/CU. FT}}{12 \text{ in} \times 12 \text{ in}} \right)$$

$$= 63.83 \times .7986$$

$$= 51 \text{ psi}$$

-20 INCHES / 63.83' SOIL

$$(.722 / 51) = .014$$

1.4% PRESSURE INCREASES

THE PLATE EDGE LOAD IS THEN:

$$P_{\text{EDGE}} = (51.722) \left(\frac{18}{2} \right) = 466 \text{ lb/IN. EDGE}$$

THE MID-PLATE DEFLECTION NORMAL TO THE PLATE SURFACE IS THEN: (DANIEL YOUNG 5th Ed Ch 8 Pg 8)

$$y_c = \frac{9a^4(5+\nu)}{64D(1+\nu)}$$

$$D = \frac{Et^3}{12(1-\nu^2)} = 331960$$

$$= \frac{(-.722)(24)^4(5+.3)}{64(331960)(1+.3)} = .046 \text{ INCHES}$$

HNF-2317
Rev 0
Page A-11

DESIGN CALCULATION

EDT 622181
Line Item #1
Page 11 of 23
Total Pages: 23

- (1) Drawing 241-AY-102 (2) Doc. No. 5556-98-027 (3) Page 9 of 9
(4) Building 241-AY-102 (5) Rev. 1 (6) Job No. _____
(7) Subject Load Detection For Member Bending Evaluation
(8) Originator Mark A. Scott Date 1-20-98
(9) Checker R. H. H. H. Date 1-20-98

- (10) THE COMBINED BENDING AND AXIAL LOAD IN THE PLATE IS ADDRESSED IN AISC SEC ED, SECTION 1.6.1, (EQ 1.6.1a & 1b).

$$\frac{f_a}{F_a} + \frac{C_{mx} f_{bx}}{\left(1 - \frac{f_a}{F_{ax}}\right) F_{bx}} + \frac{C_{my} f_{by}}{\left(1 - \frac{f_a}{F_{ay}}\right) F_{by}} \leq 1.0$$

$$\frac{f_a}{F_a} + \frac{f_{bx}}{F_{bx}} + \frac{f_{by}}{F_{by}} \leq 1.0$$

$$F_a = \frac{466}{.5} = 932 \text{ psi}$$

$$F_a = \frac{12\pi^2 E}{23(KL/r)^2} = 1350$$

$$\frac{KL}{r} = \frac{1.0(48)}{(.53/12)^{1/2}} = 333$$

$$F_{ax} = F_a$$

$$f_{bx} = 2059 \text{ psi} \quad f_{by} = 0$$

$$\frac{932}{1350} + \frac{2059}{\left(1 - \frac{932}{1350}\right) 21600} + 0$$

$$.69 + .31 = 1.0 \leq 1.0$$

$$\frac{932}{21600} + \frac{2059}{21600} = .138 \leq 1.0$$

January 15, 1998

SESC-98-027
Revision.1

J. W. Lentsch, Project Manager
Waste Disposal
Numatec Hanford Corporation
Post Office Box 1300 S2-48
Richland, WA 99352

Dear Mr. Lentsch:

**STRUCTURAL EVALUATION OF SECONDARY LINER IN 241-AY-102 TANK
ANNULUS AND DUCT SUBJECT TO 20 INCH NEGATIVE PRESSURE**

The application of a maximum minus 20-inches water gage pressure (vacuum) on the annulus space of 241-AY-102 tank using the annulus ventilation system is acceptable. The attached calculations demonstrate the adequacy of the tank liner with a minimum safety factor of 7.5 against buckling and 6.9 against allowable stress of the liner.

The increased negative pressure from the annulus is necessary to achieve the differential pressure required to produce the airflow through the annulus distribution plenum under the waste tanks and up the annular space for cooling. If use of the existing annulus exhaust fan cannot produce the required flow rate, the use of a pusher blower may be required. With the use of an additional pushing blower on the inlet, failure of the annulus exhaust fan would result in a positive pressure on the annulus which would result in an increased pressure differential on the primary tank shell. To preclude this increased pressure differential that could buckle the primary shell, there should be a shutdown of the pressurizing side of the system (if used) to preclude increasing the annular pressure above atmospheric or greater than the limits imposed by HNF-1838, "Assessment of Project W-030 Relief Valve Pressure Setting on Internal Vacuum Specification Limits for AY and AZ Tank Farm Primary Tanks," dated November 1997. The primary shell should not have internal positive pressures that exceed a net 60-inches accounting for the vacuum in the annulus.

Review of the original heater housing H-2-77326, for the same negative pressures appeared to be marginal from the guidelines outlined in Table 2A, Sheet Metal and Air Conditioning Contractors National Association (SMACNA) manual 15d, Accepted Industry Practice for Industrial Duct Construction. This section was rebuilt (Dwg H-2-92481, Sht 2) with duct wall thicknesses of 14 gage with 1-1/2" x 1-1/2" x 1/4" angle reinforcements in the corners. This exceeds the recommended guidelines and will be adequate at the applied vacuum of -20 inches water gage.

Mr. J. W. Lentsch
Page 2
January 15, 1998

EDT 622181
Line Item #1
Page 13 of 23
Total Pages: 23

SESC-98-027

The 16-inch diameter round duct is 10 gage material and by the same SMACNA Manual Table 1A is good for -20-inches water gage with reinforcement spacing less than 8 feet on center.

The balance of the duct-work in this system is specified to comply with design pressures of +60 to -20 inches water gage in the new construction specification B-672-C2, "Construction Specification for AY-102 Annulus Vent Upgrade Piping with Cathodic Protection". The filter housing is addressed in WHC-S-0434, "Specification for Vendor Services and Parts Required to Support the Replacement of Annulus Exhaust HEPA Assemblies K1-5-1/K1-5-2 and K2-5-1/K2-5-2", Section 3.3.1.5 with a design negative or positive pressure of 20 inches water gage. The exhaust duct is connected to the exhaust fan with a rubber boot or bellows. This was demonstrated by the specification of the flexible ducting in "Specification for Vendor Services and Parts Required to Support the Replacement of Fans K1-3-2 and K2-3-2, annulus Vent Fans, Located in 241-AY Tank Farm", Section 3.4.7.1.A and a vendor specification sheet 942 U design with telecon notes stating a design negative or positive pressure of 1 pound per square inch which is the equivalent of +/-28 inches water gage.

The AY-102 leak detection pit will be subject to the same -20 inches water gage which is the equivalent of 100 pounds per square foot. By inspection of drawings H-2-64317, H-2-64318, H-2-64319, H-2-64424 and H-2-64430, the negative pressure on the side walls and top of the sump of the leak detection pit increases the initial soil load pressure at a depth of fifty feet by less than 2 percent. By engineering judgement, this little increase in load is acceptable. Neglecting the offsetting gravity load of the bottom plate, the net bending stress is less than 2500 pounds per square inch. This has a safety factor of 8.65 to the allowable stress.

Because there are limited specifications for the inlet filter housing, a structural evaluation could not be completed. To preclude exposing the filter housing to high negative pressures, the inlet storm shutter (MK-6301) must be locked in an open position.

Should you have any additional questions related to this analysis, please contact me at 376-5152.

Sincerely,

Mark A. Scott, P.E., SE
Senior Engineer

*DRAFT / FINAL TO BE ON SESC
LETTER HEAD W/ADD'L
CALCS.*

kld

Attachment

HNF-2317
Rev 0
Page A-14

SESC

SGN Eurisys Services Corporation
An SGN/Cogema, Inc. Company

EDT 622181
Line Item #1
Page 14 of 23
Total Pages: 23

January 15, 1998

SESC-98-027

J. W. Lentsch, Project Manager
Waste Disposal
Numatec Hanford Corporation
Post Office Box 1300 S2-48
Richland, WA 99352

Dear Mr. Lentsch:

**STRUCTURAL EVALUATION OF SECONDARY LINER IN 241-AY-102 TANK
ANNULUS AND DUCT SUBJECT TO 20 INCH NEGATIVE PRESSURE**

The application of a maximum minus 20-inches water gage pressure (vacuum) on the annulus space of 241-AY-102 tank using the annulus ventilation system is acceptable. The attached calculations demonstrate the adequacy of the tank liner with a minimum safety factor of 7.5 against buckling and 6.9 against allowable stress of the liner.

The increased negative pressure from the annulus is necessary to achieve the differential pressure required to produce the airflow through the annulus distribution plenum under the waste tanks and up the annular space for cooling. If use of the existing annulus exhaust fan cannot produce the required flow rate, the use of a pusher blower may be required. With the use of an additional pushing blower on the inlet, failure of the annulus exhaust fan would result in a positive pressure on the annulus which would result in an increased pressure differential on the primary tank shell. To preclude this increased pressure differential that could buckle the primary shell, there should be a shutdown of the pressurizing side of the system (if used) to preclude increasing the annular pressure above atmospheric or greater than the limits imposed by HNF-1838, "Assessment of Project W-030 Relief Valve Pressure Setting on Internal Vacuum Specification Limits for AY and AZ Tank Farm Primary Tanks," dated November 1997. The primary shell should not have internal positive pressures that exceed a net 60-inches accounting for the vacuum in the annulus.

Review of the original heater housing H-2-77326, for the same negative pressures appeared to be marginal from the guidelines outlined in Table 2A, Sheet Metal and Air Conditioning Contractors National Association (SMACNA) manual 15d, Accepted Industry Practice for Industrial Duct Construction. This section was rebuilt (Dwg H-2-92481, Sht 2) with duct wall thicknesses of 14 gage with 1-1/2" x 1-1/2" x 1/4" angle reinforcements in the corners. This exceeds the recommended guidelines and will be adequate at the applied vacuum of -20 inches water gage.

HNF-2317
Rev 0
Page A-15

Mr. J. W. Lentsch
Page 2
January 15, 1998

EDT 622181
Line Item #1
Page 15 of 23
Total Pages: 23

SESC-98-027

The 16-inch diameter round duct is 10 gage material and by the same SMACNA Manual Table 1A is good for -20-inches water gage with reinforcement spacing less than 8 feet on center.

The balance of the duct-work in this system is specified to comply with design pressures of +60 to -20 inches water gage in the new construction specification B-672-C2. The filter housing is addressed in WHC-S-0434. *The filter plus duct joint specifications are given in WHC-S-0418 and are #1 good to ± 1 psi.*

Should you have any additional questions related to this analysis, please contact me at 376-5152.

Sincerely,

Mark A. Scott, P.E., SE
Senior Engineer

kld

Attachment

AQ-102

The leak detection pit is connected to ~~the~~ annulus ventilation. The pit ~~was~~ design was examined and was found to be able to withstand ± 20 inches WC, by inspection,

~~the~~ Because there are limited specifications for the inlet filter housing ~~they~~ ^{it was} ~~were~~ not evaluated, therefore the inlet filter storm shutter (MK-6301) will need to be locked open for the test,

HNF-2317
Rev 0
Page A-16

ATTACHMENT

STRUCTURAL EVALUATION OF SECONDARY LINER IN 241-AY-102

TANK ANNULUS SUBJECT TO

20-INCH NEGATIVE PRESSURE

Letter Number

SESC-98-027

Consisting of

6 pages

DESIGN CALCULATION

EDT 622181

Line Item #1

Page 17 of 23

Total Pages: 23

(1) Drawing 241-AY-102 (2) Doc. No. _____ (3) Page 2 of 6
(4) Building 241-AY-102 (5) Rev. _____ (6) Job No. _____
(7) Subject ANNULUS VACUUM EVALUATION
(8) Originator MARK A SCOTT Date 1-14-98
(9) Checker L.J. JULY Date 1/15/98

(10)

THE ANNULUS SPACE IN 241-AY-102 WILL BE SUBJECTED TO A -20 IN WATER GAGE PRESSURE (VACUUM) DURING OPERATION. THIS ANALYSIS WILL EVALUATE THE SECONDARY LINER.

THE SECONDARY LINER AS SHOWN IN DRAWING H-2-64449 IS A $\frac{1}{4}$ INCH THICK CARBON STEEL PLATE. THE LINER WAS UTILIZED AS FORMWORK FOR THE PLACEMENT OF THE STRUCTURAL CONCRETE. THE SIDE OF THE LINER NEXT TO THE CONCRETE WAS RESTRAINED BY FORM TIES THAT ATTACHED TO STUDS WELDED TO THE LINER ON 2 FOOT CENTERS (DETAIL B, H-2-64449 AND NOTE 4 ON H-2-64447). THE STUDS WERE DRILLED AND TAPPED FOR $\frac{1}{4}$ " ϕ UNC 20 THREADS. THERE ARE NO DIRECT CODE APPLICATIONS FOR THIS TYPE OF CONFIGURATION. THE LINER WILL THEN BE ANALYZED FOR BUCKLING STABILITY AND THE ANCHORS FOR LOAD CAPACITY TO RESIST THE APPLIED NEGATIVE PRESSURE.

HNF-2317

Rev 0

Page A-18

DESIGN CALCULATION

 EDT 622181
 Line Item #1
 Page 18 of 23
 Total Pages: 23

(1) Drawing 241-AY-102 (2) Doc. No. 3 of 6
 (4) Building 241-AY-102 (5) Rev. (6) Job No.
 (7) Subject ANNULUS VACUUM EVALUATION
 (8) Originator MARK A SCOTT Date 1-14-98
 (9) Checker L. J. JULY Date 1/15/98

(10)

THE LOAD CAPACITY OF THE STUD IS LIMITED BY THE FORM TIE CONNECTION TO THE $\frac{1}{4}"$ UNC-20 THREADED CONNECTION. ASSUMING A MINIMUM A307 BOLTING MATERIAL AT THE THREAD ROOT. CROSS SECTIONAL AREA, THE ALLOWABLE LOAD IS:

$$P_{ALLOW} = (F_t)(A) = 636 \text{ kps} = 636 \text{ LB}$$

$$F_t = 20 \text{ ksi (AISC 8TH ED) A307}$$

$$A = .0318 \text{ IN}^2 \text{ (MACHINERY'S HANDBOOK 25TH ED TABLE 39 PAGE 1640)}$$

THE MAXIMUM APPLIED LOAD IS:

$$P_{MAX} = 20 \text{ IN} \times \frac{62.4}{1728} \times 24 \text{ IN} \times 24 \text{ IN} = 416 \text{ LB}$$

$$636 > 416$$

OK

THE LINER BEING RESTRAINED LOCALLY BY THE CONCRETE ANCHORS IS SUBJECT TO BUCKLING UNDER NEGATIVE PRESSURE. THE BEST REPRESENTATION OF THE BOUNDARY CONDITIONS OF THIS CONFIGURATION IS FOUND IN STRENGTH OF MATERIALS, PART II, TIMOSHENKO, FIG 121. THE END CONSTRAINTS ARE AT THE ANCHOR SPACING OF 24 INCHES.

(1) Drawing _____ (2) Doc. No. _____ (5) Rev. _____ (6) Job No. _____
 (4) Building 241-A(-102) (5) Rev. _____ (6) Job No. _____
 (7) Subject ANNULUS VACUUM EVALUATION
 (8) Originator MARK A. SCOTT Date 1-14-93
 (9) Checker L. J. JULY Date 1/15/93

FIG. 121.

$$q_{cr} = \frac{EI}{R^3} \left(\frac{4\pi^2}{\alpha^2} - 1 \right) \quad (157)$$

STRENGTH OF MATERIALS
 PART II; ADVANCED THEORY
 AND PROBLEMS, 3RD ED.

S. TIMOSHENKO

VAN NOSTRAND

$$E = 29E^6 \text{ PSI}$$

$$I = \frac{1'' \times h^3}{12} = .0013$$

$$h = \text{thickness} = .25 \text{ IN}$$

$$R = 40 \text{ FT} = 480 \text{ IN}$$

$$\alpha = \frac{24''}{2(480)\pi} (2\pi) = .05 \text{ RAD}$$

$$q_{cr} = \frac{29E^6 (.0013)}{480^3} \left(\frac{4\pi^2}{(.05)^2} - 1 \right) \frac{\text{LB/IN}^2 \cdot \text{IN}^4}{\text{IN}^3}$$

$$= 5.38 \text{ lb/in}$$

LOAD ALONG A 1 INCH WIDE
 STRIP. THIS CORRELATES
 TO A SURFACE PRESSURE
 OF 5.38 PSI

THE EQUIVALENT WATER GAGE PRESSURE
 IS:

$$P_{cr} = 5.38 \text{ PSI} \frac{1728}{62.4} = 150 \text{ INCHES W.G.}$$

$$SF = \frac{150}{20} = 7.5$$

THE MAXIMUM CIRCUMFERENTIAL STRESS
 IS:

$$\sigma = \frac{PR}{t} = \frac{20 \left(\frac{62.4}{1728} \right) 480}{.25} = 1387 \text{ PSI}$$

O.K.

DESIGN CALCULATION

EDT 622181

Line Item #1

Page 20 of 23

Total Pages: 23

(1) Drawing _____ (2) Doc. No. _____
 (4) Building 241-AY-102 (5) Rev. _____ (6) Job No. _____
 (7) Subject ANNULUS VACUUM EVALUATION
 (8) Originator MAKER A SCOTT Date 1-14-98
 (9) Checker L.J. JULY Date 1/15/98

(10)

THE SECONDARY LINER WAS SPECIFIED
 IN HWS-7789 AS ASTM A515 GRADE 60.
 THE ALLOWABLE STRESS IS THEN:

$$\sigma_{allow} = .6F_y = .6(60) = 36 \text{ ksi}$$

THE RESULTING SAFETY FACTOR IS THEN:

$$SF = \frac{36000}{1397} = 26$$

THE ROOF OF THE SECONDARY TANK IS
 ALSO ANCHORED IN THE SAME MANNER
 AS THE SIDE WALLS. WITH THE DOUBLE
 CURVED SURFACE, BY OBSERVATION, THE
 BUCKLING IS BOUNDED BY THE SINGLE
 CURVATURE CALCULATION. THE DOUBLE
 CURVATURE WILL HAVE A HIGHER BUCKLING
 LIMIT.

THE FLOOR OF THE SECONDARY LINER
 CAN BE SIMPLY EVALUATED AS A FIXED
 END BEAM FROM THE RING AT THE
 EDGE OF THE REFRACTORY CONCRETE
 TO THE TANK WALL. THE RESULTING
 MAXIMUM STRESS IS THEN:

$$\sigma_b = \frac{M}{S} = \frac{wL^2/12}{bt^2/6} = \frac{5415}{.0104} = 5198 \text{ psi}$$

$$b = 1''$$

$$t = .25''$$

$$w = 20 \left(\frac{62.4}{1728} \right) = .722 \text{ psi}$$

$$L = 2'-6'' = 30''$$

HNF-2317

Rev 0

Page A-21

DESIGN CALCULATION

(1) Drawing _____ (2) Doc. No. _____ EDT 622181
 (4) Building 241-AT-102 (5) Rev. _____ Line Item #1 _____ Page 6 of 6
 (7) Subject ANNULUS VACUUM EVALUATION Page 21 of 23
 (8) Originator MARIC A SCOTT Date 1-14-93 Total Pages: 23 lo. _____
 (9) Checker L. J. JULY Date 1/15/93

(10) THE RESULTING SAFETY FACTOR IS THEN:

$$SF = \frac{36000}{5198} = 6.9$$

(1) Drawing _____ (2) Doc. No. _____ (3) Page 1 of 2
(4) Building 241-AM-102 (5) Rev. _____ (6) Job No. _____
(7) Subject LEAK DETECTION PIT NEGATIVE PRESSURE EVALUATION
(8) Originator MAURICE A. SCOTT Date 1-16-98
(9) Checker _____ Date _____

(10)

EVALUATE THE LEAK DETECTION PIT FOR AN INTERNAL NEGATIVE PRESSURE OF -20 INCHES WATER GAGE. THE BOTTOM PLATE IS A 1/2 INCH THICK PLATE WITH A 4'0" DIAMETER AREA EXPOSED TO THE NEGATIVE PRESSURE. THE STRESSES ASSUMING THE EDGES FIXED: (H-2-64317)

$$M_{TMAX} = \frac{-W}{4\pi} \quad W = pA = p\left(\frac{\pi D^2}{4}\right) \quad \text{KSI IN}^2$$

$$= \frac{1306.5}{4\pi} \quad = 1306.5 \text{ lb}$$

$$= 103.97 \text{ IN-LB}$$

$$\sigma = 6M/t^2 \quad \text{ROARK, "FORMULAS FOR STRESS AND STRAIN" 5TH ED. TABLE 24, CASE 17}$$

$$= 104(6)/.5^2$$

$$= 2496 \text{ psi}$$

ASSUMING SIMPLY SUPPORTED AT THE EDGES USE CASE 16.

$$M_{TMAX} = \frac{W}{4\pi} \left[(1+\nu) \ln \frac{a}{r_0} + 1 \right]$$

$$a = 24"$$

$$\nu = .3$$

$$r_0 = 24"$$

$$= \frac{W}{4\pi} \quad \text{THIS VALUE IS EQUAL TO CASE 17}$$

$$\text{ALLOWABLE STRESS} = .6 F_y = .6 (36000) = 21600 \text{ psi} \quad \text{ASTM A-36}$$

$$\text{SAFETY FACTOR} = \frac{21600}{2496} = 8.65$$

DESIGN CALCULATION

EDT 622181

Line Item #1

Page 23 of 23

Total Pages: 23

2 of 2

- (1) Drawing _____ (2) Doc. No. _____
 (4) Building 241-AY-102 (5) Rev. _____ (6) Job No. _____
 (7) Subject LEAK DETECTION PIT - NEGATIVE PRESSURE EVALUATION
 (8) Originator MARK A. SUELL Date 1-16-98
 (9) Checker _____ Date _____

(10)

THE SIDEWALL PRESSURE INCREASE IS SLIGHT COMPARED TO THE SOIL DEPTH PRESSURE. THE -20 INCHES WATER GAGE IS EQUIVALENT TO .722 PSI. THE SOIL PRESSURE AT EL. 617.75 BELOW THE SOIL SURFACE EL. 667.46 IS (H-2-64317)

$$P_{\text{soil}} = (667.46 - 617.75) \left(\frac{115 \text{ PCF}}{12 \times 12} \right) =$$

$$= 49.7' \times .7986 \text{ PSI/FT}$$

$$= 39.7 \text{ PSI}$$

THE PERCENTAGE INCREASE IS:

$$\frac{39.7 + .722}{39.7} = 1.0182 - 1 = .0182$$

$$\leq 2\%$$

OK BY INSP.

APPENDIX B

CROSS CONTAMINATION PATHWAYS EVALUATION

DON'T SAY IT --- Write It!

DATE: February 17, 1998

TO: M.A. Lane

S2-47

FROM: D.L. Evans-04 S2-47

Telephone: 373-2688

SUBJECT: Potential Cross Connections Between Tank 241-AY-102's Annulus and Internal Containment Volume

An investigation into the possible cross connections between the annulus and the internal containment volume of Tank 241-AY-102, (2AY) was undertaken by Fluor Daniel Northwest, FDNW. The investigation included review of the existing facility drawings, interviews with facility personnel and camera surveys, conducted by Lockheed Martin Hanford Corp., of the Annulus Pump Pit (02F) and Leak Detection Pit. Based on this investigation, no open cross connections were identified.

A test of the existing 2AY's annulus air system was initiated on January 21, 1998. The test ran for more than 10 days and maintained a negative pressure (in excess of 12 in WG) on the tank annulus relative to the tank dome air space. The annulus exhaust stack was continuously monitored and no release of contaminated materials was recorded. This confirms that no measurable flow path for contaminated air (cross connection) exists between the tank dome air space and the annulus.

The results of the investigation for individual systems are as follows:

1. Ventilation systems

Statement: Cross connection through an 8" vent line, containing two isolation valves, between the annulus and the 20" dome exhaust line.

Drawings: H-2-64403 General Piping Arrangement, 241-AY, Tank Farm
H-2-64406 Piping Plan, TK102, 241-AY, Tank Farm
H-2-77323 Abandon, Annulus, Vent Piping, Tank 241-AY-102
H-2-77324 Annulus Vent Piping, TK102, 241-AY, Tank Farm
H-2-131086 Piping Plan, AY, Tank Farm

Resolution: Project W030 is to cut and cap 8" cross tie line.

Status: Work has been completed.

HNF-2317

Rev 0

Page B-2

2. Annulus Pump Pit, 241-AY-02F

Potential cross connections exist through the pit process piping and the pit floor drain.

2.1 Annulus pump pit process piping

Statement: The potential process pipe cross connection is via the transfer pump intake, located in the annulus, through the pump and its discharge line, to either 2AY's dome space or to the Pump Pit, 02A. If the return pipeline to 2AY is not blanked, then a path exists through the line which ends 5'-0" above the bottom of the tank, in the dome air space, if the fluid is below this level. If the pipeline is not blanked, to Pit 02A, then the return path is through 02A's ancillary systems.

Drawings: H-2-63796 241-AY Tank Farm, Annulus Pump Pit, Arrangement
H-2-64329 Structural Concrete, Annulus Pump Out Pit, Plans & Sections
H-2-64400 Sht 6 IEFD, Tank Farm
H-2-64403 General Piping Arrangement, 241-AY, Tank Farm
H-2-64406 Piping Plan, TK102, 241-AY, Tank Farm
H-2-64441 Jumper Assy, 241-AY-Leak Detection Pit, Annulus Pump Pit
H-2-64429 241-AY Tank Farm, Leak Detection Pit, Arrangement
H-2-64444 Jumper Assy, 241-AY-Leak Detection Pit, Annulus Jet Out
H-2-64458 Jumper Assembly, 241-AY Annulus Pump Pit
H-2-95398 Sheets 1 & 2 Floor Drain Seal Modification

Resolution: Install process blanks on the two outlet nozzles in the 02F pit.

Status: Verified the process blanks in place, by video inspection conducted on January 9, 1998.

2.2 Annulus pump pit floor drain

Statement: The pump pit floor drain is routed, via the return pipeline described in paragraph 2.1, to 2AY.

Drawings: Same as above (2.1)

Resolution: Install the floor drain seal shown on drawing H-2-95398 Sheets 1 & 2 or maintain 2AY's waste level above 64 in.

Status: Verified the floor drain seal in place, by video inspection conducted on January 9, 1998. Verified that the tank waste level is above 5'-4".

3. Tank 241-AY-102's Leak Detection Pit

Potential cross connections exist through the pit process piping and the pit floor drain.

3.1 Leak detection pit process piping

Statement: Cross connection from the 2" vent, through the leak detection pit, to diverter station 241-AX-152.

Drawings: H-2-64317 Leak Detection Pit & Slab Drain Piping
H-2-64400 Sheets 1-8 IEFD Tank Farm
H-2-64406 Piping Plan, TK-102, 241-AY, Tank Farm
H-2-64411 Direct Buried lines, Sections & Details, 241-AY Tank Farm
H-2-64419 Tank Riser Details
H-2-64424 Pump Sluice & Leak Detection Pit, Blind Flange Details
H-2-64429 241-AY Tank Farm, Leak Detection Pit, Arrangement
H-2-64430 241-AY Tank Farm, Leak Detection Pit, Piping Sect & Dtls
H-2-64441 Jumper Assy, 241-AY-Leak Detection Pit, Annulus Pump Pit
H-2-64442 Jumper Assy, 241-AY-Leak Detection Pit, Electrical Conn.
H-2-64444 Jumper Assy, 241-AY-Leak Detection Pit, Annulus Jet Out
H-2-95398 Sheets 1 & 2 Floor Drain Seal Modification
H-2-131086 Sheet 4 Piping Plan, AY Tank Farm

Resolution: Install a process blank on the leak detector pit outlet nozzle.

Status: Verified the process blank in place, by video inspection conducted on January 17, 1998.

3.2 Annulus leak detection pit floor drain cross connection

Statement: The leak detection pit floor drain is routed to 2AY, through riser 11, via a pipeline which ends 5'-0" above the tank bottom.

Drawings: Same as above (3.1)

Resolution: Assure floor drain seal is in place per drawing H-2-95398 sheets 1 & 2 or maintain 2AY's waste level above 5'-4".

Status: Verified that the tank waste level is above 5'-4".

4. Process Lines through the Annulus

Statement: Penetration of process lines through the North and South sides of the annulus wall and the tank wall.

Drawings: H-2-34690 Dome Plan Penetration Tank-102-AY
H-2-64448 Tank Penetration Details

Resolution: As detailed on drawing H-2-64448, these penetrations were installed with asbestos packing gland type seals. The installed seals do prevent cross connection.

Status: No action required.

5. Primary Tank Leak

Statement: A breach in the primary tank wall providing a cross-connection path to the annulus. If a breach existed, the present leak detection system would activate.

Drawings: H-2-64448 Tank Penetrations and Details
H-2-64449 Tank Elevation and Details

Resolution: Dome shell assumed to be intact.

Status: No action required.

6. Ventilation Condensate

Statement: Annulus ventilation exhaust piping condensate drain, is routed to the 02D pit drain, which is then routed to the tank.

Drawings: H-2-64400 Sheets 2, 5, & 7 IEFD Tank Farm

Resolution: Drain has been capped per a conversation with Mr. M.M. (Mark) Jennings.

Status: Verified the cap is in place.

7. Thermocouple and General Conduit Penetrations

Statement: Various conduits within the annulus space may be cross connected to conduits entering the dome space.

Drawings: H-2-64369 Instm, Tank Annulus, Leak Detection Sys, Plan & Details
H-2-64372 Instrumentation, Insulating Concrete, Plan & Details
H-2-64374 Instm, Concrete Foundation, Tank 102 - Plan & Details
H-2-64376 Instrumentation, Tank Cable Routing, Plan & Details

Resolution: The conduits within the annulus space are well sealed to prevent air leakage into or around the conduits.

Status: No action required.

APPENDIX C
TEST DATA COMPILATION

HNF-2317
Rev 0
Page C-2

TEST NOTES. 1. Wind direction is degrees from North from which the wind is blowing. For example a wind direction of 270.0 degrees is a wind blowing from the West.	(3)15.5 INWG, 950 FPM, T1=40, T2=59					(3)15.5 INWG, 900 FPM, T1=31, T2=58	1	2	3	4	5	6	7	8	9	10
DATE						26-Jan-98								27-Jan-98		
TIME	4:45	7:45	10:45	13:45	4:45	7:45	7:45	10:45	13:45	16:45	19:45	22:45	1:45	4:45	7:45	
ELAPSED TIME	65.75	68.75	71.75	74.75	89.75	92.75	95.75	98.75	101.75	104.75	107.75	110.75	113.75	116.75		
FLOW (FPM)					950.00	800.00	900.00	900.00	900.00	900.00	900.00	900.00	850.00	900.00	800.00	
FLOW (CFM)					1168.50	984.00	1107.00	1107.00	1107.00	1107.00	1107.00	1107.00	1045.50	1107.00	984.00	
ANN. VAC (inwg)					15.50	15.60	15.60	15.50	15.50	15.50	15.50	15.50	15.50	15.50	15.40	
Avg. Wind (MPH)	3.00	7.70	0.00	9.20	8.50	4.10	4.40	5.50	3.80	9.00	8.50	4.30	4.20	5.90		
Wind Direct. (1)	303.50	262.10	0.00	301.40	186.30	298.80	313.40	304.50	248.60	284.40	269.80	287.20	79.90	288.20		
BAR. PRESS (INHG)	29.281	29.287	29.316	29.212	29.183	29.243	29.245	29.205	29.181	29.167	29.161	29.181	29.176	29.194		
T in (F)					31.00	32.00	48.00	50.00	41.00	41.00	39.00	37.00	38.00			
T out (F)					58.00	58.00	60.00	60.00	60.00	60.00	60.00	59.00	59.00	59.00		
Qp (BTU/min)					598.18	485.07	251.86	209.89	398.79	398.79	398.79	396.45	461.75	391.79		
CAM (CPM)					950.00	800.00	900.00	1000.00	1100.00	900.00	900.00	950.00	950.00	700.00		
INSULATING CO																
1	71	71	70	70	69	68	67	68	68	68	68	68	68	67	67	
2	68	68	68	66	66	65	64	65	65	65	65	65	64	64	64	
3	76	75	75	75	74	74	74	73	73	73	73	73	73	73	73	
4	66	66	66	65	65	64	63	63	64	64	64	64	64	64	63	
5	77	77	76	76	75	75	74	74	74	74	73	74	74	74	73	
6	82	81	80	80	80	79	79	79	79	79	79	79	79	78	78	
7	82	81	80	80	72	71	71	71	71	71	71	71	71	70	70	
8																
9																
10	71	71	70	70	70	69	69	68	69	69	69	69	69	69	69	
11	73	73	72	72	72	71	70	70	71	71	71	71	71	70	70	
12	73	73	72	72	72	72	72	72	72	72	72	72	72	72	72	
13	71	70	70	70	70	70	70	70	70	70	70	70	69	69	69	
14	72	72	72	72	73	72	73	72	72	72	72	72	72	72	72	
15	70	70	70	69	70	70	69	69	69	69	69	70	69	70	69	
16	70	70	70	70	70	70	70	69	70	70	70	70	70	70	69	
17	72	71	71	71	71	71	71	70	70	70	71	70	70	70	70	
18																
19														69	69	
20																
21	70	70	69	69	70	69	69	68	69	69	69	69	69	69	69	

TEST NOTES: 1. Wind direction is degrees from North from which the wind is blowing. For example a wind direction of 270.0 degrees is a wind blowing from the West.														
	11	12	13	14	15	16	17	18	19	20	21	22	23	24
DATE						28-Jan-98								29-Jan-98
TIME	10:45	13:45	16:45	19:45	22:45	1:45	4:45	7:45	10:45	13:45	16:45	19:45	22:45	1:45
ELAPSED TIME	119.75	122.75	125.75	128.75	131.75	134.75	137.75	140.75	143.75	146.75	149.75	152.75	155.75	158.75
FLOW (FPM)	950.00	900.00	900.00	900.00	800.00	800.00	900.00	900.00	900.00	950.00	950.00	950.00	900.00	900.00
FLOW (CFM)	1168.50	1107.00	1107.00	1107.00	984.00	984.00	1107.00	1107.00	1107.00	1168.50	1168.50	1168.50	1107.00	1107.00
ANN. VAC (inwg)	15.50	15.00	15.50	15.50	15.50	15.50	15.50	15.50	15.50	15.50	15.50	15.50	15.50	15.50
Avg. Wind (MPH)	0.00	0.00	0.00	2.30	5.40	6.20	12.70	10.30	7.10	6.30	12.90	15.50	9.40	7.50
Wind Direct. (1)	0.00	0.00	0.00	288.40	285.70	311.00	288.90	296.40	318.70	304.60	276.30	281.50	282.30	283.90
BAR. PRESS (INHG)	29.249	29.245	29.267	29.281	29.281	29.285	29.294	29.281	29.256	29.185	29.108	29.035	28.97	28.917
T in (F)	46.00	56.00	45.00	45.00	34.00	31.00	29.00	36.00	52.00	60.00	60.00	45.00	38.00	37.00
T out (F)	60.00	61.00	60.00	60.00	58.00	58.00	58.00	58.00	58.00	60.00	60.00	58.00	58.00	58.00
Qp (BTU/min)	310.17	104.94	314.83	314.83	447.76	503.73	608.67	461.75	125.93	0.00	0.00	288.01	419.77	440.76
CAM (CPM)	800.00	700.00	900.00	900.00	800.00	900.00	850.00	850.00	800.00	800.00	800.00	800.00	800.00	800.00
INSULATING CO														
1	68	67	67	68	67	66	66	66	65	65	66	66	66	66
2	64	64	64	65	65	64	64	63	62	62	63	63	63	63
3	73	72	72	72	73	72	72	71	71	71	71	71	71	71
4	64	64	64	64	64	64	64	63	61	62	62	62	62	63
5	74	73	73	74	74	73	73	73	71	71	72	72	72	71
6	78	78	78	78	78	77	77	77	76	76	77	77	77	77
7	71	70	70	70	71	70	70	69	68	68	69	69	70	69
8														
9														
10	69	69	69	69	68	69	68	68	67	67	68	68	68	68
11	70	70	70	70	70	70	70	69	68	68	68	69	69	69
12	72	71	72	72	72	71	72	71	70	71	71	71	71	71
13	70	69	69	70	70	69	70	68	68	68	69	69	69	69
14	72	71	72	72	70	72	72	72	71	71	71	72	72	71
15	70	70	69	70	70	70	71	69	68	68	68	69	69	69
16	70	70	70	70	71	70	71	70	68	68	69	69	70	69
17	71	70	70	71	70	70	71	70	69	69	70	70	70	70
18														
19	69	69	70	69	69	70	69	70	69	69	70	71	70	71
20														
21	69	68	69	69	70	68	69	68	68	68	68	69	69	69

HNF-2317
Rev 0
Page C-5

TE DATA

TEST NOTES: 1. Wind direction is degrees from North from which the wind is blowing. For example a wind direction of 270.0 degrees is a wind blowing from the West																
	39	40	41	42	43	44	45	46	47	48	49	50	51	52		
DATE	31-Jan-98					1-Feb-98										
TIME	22:45	1:45	4:45	7:45	10:45	13:45	16:45	19:45	22:45	1:45	4:45	7:45	10:45	13:45		
ELAPSED TIME	203.75	206.75	209.75	212.75	215.75	218.75	221.75	224.75	227.75	230.75	233.75	236.75	239.75	242.75		
FLOW (FPM)	850.00	850.00	850.00	850.00	900.00	900.00	1000.00	850.00	800.00	850.00	850.00	800.00	900.00	800.00		
FLOW (CFM)	1045.50	1045.50	1045.50	1045.50	1107.00	1107.00	1230.00	1045.50	984.00	1045.50	1045.50	984.00	1107.00	984.00		
ANN. VAC (inwg)	15.50	15.50	15.70	15.80	15.70	15.50	15.50	15.50	15.50	15.50	15.50	15.50	15.50	15.50		
Avg. Wind (MPH)	13.40	11.10	7.70	8.10	5.20	6.50	2.90	9.90	8.70	4.60	0.80	2.80	4.20	6.00		
Wind Direct. (1)	274.70	288.10	282.20	285.70	354.10	359.60	302.70	273.40	260.10	202.90	272.30	164.60	300.90	295.60		
BAR. PRESS (INHG)	29.294	29.26	29.229	29.214	29.214	29.154	29.119	29.099	29.068	29.063	29.028	29.006	28.982	28.902		
T in (F)	32.00	32.00	30.00	38.00	48.00	50.00	58.00	35.00	36.00	30.00	27.00	33.00	48.00	49.00		
T out (F)	57.00	56.00	56.00	58.00	60.00	60.00	61.00	58.00	58.00	58.00	57.00	58.00	60.00	59.00		
Qp (BTU/min)	495.57	475.74	515.39	396.45	251.86	209.89	69.96	455.92	410.45	555.04	594.68	466.42	251.86	186.57		
CAM (CPM)	150.00	150.00	150.00	150.00	140.00	170.00	150.00	150.00	150.00	200.00	175.00	200.00	200.00	175.00		
INSULATING CO																
1	66	65	64	64	62	62	61	64	61	64	63	61	60	61		
2	64	62	63	61	60	60	60	62	62	61	61	59	59	59		
3	71	71	70	69	68	68	67	69	69	69	69	67	68	68		
4	63	63	62	61	60	60	60	62	62	62	61	59	59	60		
5	72	72	71	71	70	69	68	71	71	71	70	68	68	69		
6	76	76	75	75	73	73	73	75	75	75	75	72	73	73		
7	69	69	68	68	66	67	66	69	68	68	68	67	66	66		
8																
9																
10	68	68	68	67	65	66	66	68	68	67	67	67	66	66		
11	68	68	68	67	64	66	65	68	68	67	67	67	65	66		
12	71	71	71	71	68	68	68	71	70	71	71	70	69	69		
13	69	69	68	68	66	67	67	68	68	68	68	68	67	67		
14	72	71	72	71	68	70	70	72	71	72	71	71	71	71		
15	69	69	69	69	66	67	72	69	68	68	69	68	68	68		
16	70	69	69	69	66	68	67	70	69	69	69	68	68	68		
17	70	69	70	69	68	68	69	70	69	69	69	69	68	69		
18																
19	70	69	70	69	68	68	69	69	68	69	70	69	69	69		
20																
21	68	68	68	68	67	67	68	68	68	72	68	68	67	67		

TE DATA

TEST NOTES: 1. Wind direction is degrees from North from which the wind is blowing. For example a wind direction of 270.0 degrees is a wind blowing from the West.															
	53	54	55	56	57	58	59	60	61	62	63	64	65	66	
	DATE			2-Feb-98								3-Feb-98			
	TIME	16:45	19:45	22:45	1:45	4:45	7:45	10:45	13:45	16:45	19:45	21:45	1:45	4:45	7:45
	ELAPSED TIME	245.75	248.75	251.75	254.75	257.75	260.75	263.75	266.75	269.75	272.75	274.75	277.75	280.75	283.75
	FLOW (FPM)	900.00	900.00	800.00	900.00	800.00	800.00	800.00	900.00	800.00	800.00	800.00	800.00	800.00	800
	FLOW (CFM)	1107.00	1107.00	984.00	1107.00	984.00	984.00	984.00	1107.00	984.00	984.00	984.00	984.00	984.00	984.00
	ANN. VAC (inwg)	15.50	15.50	15.50	15.50	15.50	15.50	15.50	15.50	15.50	15.50	15.50	15.50	15.50	15.5
	Avg. Wind (MPH)	7.40	7.70	5.80	7.40	4.10	5.50	4.90	0.00	0.00	8.40	11.80	9.90	9.40	12.9
	Wind Direct. (1)	265.90	260.00	281.10	249.50	207.60	231.50	145.00	0.00	0.00	287.70	277.60	294.60	287.60	279.2
	BAR. PRESS (INHG)	28.889	28.919	28.962	28.993	29.028	29.074	29.125	29.09	29.068	28.986	28.939	28.809	28.76	28.774
	T in (F)	40.00	38.00	37.00	37.00	31.00	34.00	40.00	46.00	40.00	42.00	41.00	39.00	39.00	39
	T out (F)	59.00	58.00	58.00	58.00	57.00	58.00	58.00	60.00	58.00	57.00	58.00	58.00	58.00	77
	Qp (BTU/min)	398.79	419.77	391.79	440.76	485.07	447.76	335.82	293.84	335.82	279.85	317.16	354.48	354.48	708.95
	CAM (CPM)	175.00	150.00	200.00	200.00	200.00	300.00	350.00	400.00	400.00	400.00	400.00	400.00	400.00	400
INSULATING CO															
1	62	63	62	62	62	62	61	62	62	66	62	60	60	61	
2	60	60	60	60	60	60	59	60	60	60	60	60	60	59	
3	68	68	68	68	68	68	67	68	67	68	68	67	67	67	
4	60	61	61	62	61	60	60	61	61	61	61	61	61	60	
5	69	70	70	70	70	69	68	70	69	69	69	69	69	68	
6	73	73	74	73	73	74	73	73	73	73	73	73	73	71	
7	67	68	67	67	67	67	66	67	67	67	68	67	67	66	
8															
9															
10	66	67	66	67	67	67	66	67	67	67	67	67	67	66	
11	66	66	66	67	67	66	66	66	66	66	66	66	66	65	
12	70	68	70	70	70	70	69	70	70	70	70	70	70	69	
13	68	66	68	68	68	68	67	68	68	68	68	68	68	67	
14	71	69	71	72	72	71	71	71	72	71	71	71	71	70	
15	68	66	68	68	68	68	68	68	68	68	68	68	68	67	
16	68	67	68	69	69	69	68	69	69	68	69	68	69	68	
17	69	67	69	69	69	69	69	69	69	69	69	69	69	68	
18															
19	69	69	69	68	69	69	69	68	69	68	68	68	68	68	
20															
21	67	68	68	68	68	68	67	66	68	68	69	69	68	68	

HNF-2317
Rev 0
Page C-7

HNF-2317
Rev 0
Page C-7

TEST NOTES: 1. Wind direction is degrees from North from which the wind is blowing. For example a wind direction of 270.0 degrees is a wind blowing from the West.																	Possible false reading.	
	67	68	69	70	71	72	73	74	75	76	77	78	79	80				
DATE						4-Feb-98												5-Feb-98
TIME	10:45	13:45	16:15	19:15	22:15	1:15	4:15	7:15	10:15	13:15	16:15	19:15	22:15	1:15				
ELAPSED TIME	286.75	289.75	292.25	295.25	298.25	301.25	304.25	307.25	310.25	313.25	316.25	319.25	322.25	325.25				
FLOW (FPM)	800	800	800	900	900	900	900	850	850	900	900	950	900	900				
FLOW (CFM)	984.00	984.00	984.00	1107.00	1107.00	1107.00	1107.00	1045.50	1045.50	1107.00	1107.00	1168.50	1107.00	1107.00				
ANN. VAC (inwg)	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5				
Avg. Wind (MPH)	12	12.8	12.3	13.3	12	11.8	10.3	8.6	8.1	3.4	3.4	5.1	5.9	4.6				
Wind Direct. (1)	281	286.8	282.5	286	279.1	282.7	271.7	268	298.1	258.7	86.9	139.6	294.9	261.7				
BAR. PRESS (INHG)	28.751	28.696	28.694	28.707	28.702	28.7	28.705	28.716	28.749	28.773	28.835	28.888	28.955	29.001				
T in (F)	40	44	43	40	40	40	40	40	40	40	46	40	37	37				
T out (F)	58	58	58	58	58	58	58	57	58	60	60	59	59	58				
Qp (BTU/min)	335.82	261.19	279.85	377.80	377.80	377.80	377.80	336.99	356.81	419.77	293.84	420.94	461.75	440.76				
CAM (CPM)	300	400	600	280	300	250	250	300	350	300	300	300	300	300				
INSULATING CO																		
1	61	62	62	62	62	62	62	62	60	61	60	62	63	62				
2	59	60	59	60	60	60	60	60	59	60	59	61	61	60				
3	67	68	66	67	67	67	67	67	65	66	64	67	67	67				
4	60	61	60	61	61	61	61	61	59	61	59	62	62	61				
5	68	69	68	69	69	69	69	69	67	68	66	69	69	69				
6	72	73	72	73	72	73	73	72	71	72	70	73	73	72				
7	66	67	66	67	67	67	67	67	66	66	65	67	80	67				
8																		
9																		
10	66	66	66	67	67	67	67	67	65	66	64	67	67	67				
11	65	66	66	66	65	66	66	66	64	65	64	66	66	66				
12	69	70	69	69	69	70	70	70	68	69	67	70	78	70				
13	67	68	67	67	67	68	68	67	66	67	65	68	68	68				
14	71	72	71	71	71	68	71	71	70	71	70	71	71	71				
15	67	68	67	68	68	68	68	68	67	67	66	68	68	68				
16	68	68	68	69	69	69	68	68	67	68	67	68	68	68				
17	68	69	68	69	69	69	69	69	68	68	68	69	69	69				
18																		
19	68	68	68	67	67	67	67	68	68	68	68	69	69	68				
20																		
21	67	67	67	69	69	69	68	67	66	67	66	68	68	67				

TEST NOTES: 1. Wind direction is degrees from North from which the wind is blowing. For example a wind direction of 270.0 degrees is a wind blowing from the West.	Performed Pilot Traverse of Inlet Duct//Approx. 1000 CFM													
	81	82	83	84	85	86	87	88	89	90	91	92	93	94
DATE								6-Feb-98						
TIME	4:15	7:15	10:15	13:15	16:15	19:15	22:15	1:15	4:15	7:15	10:15	13:15	16:15	19:15
ELAPSED TIME	328.25	331.25	334.25	337.25	340.25	343.25	346.25	349.25	352.25	355.25	358.25	361.25	364.25	367.25
FLOW (FPM)	900	900	900	900	900	900	900	900	850	850	900	875	875	870
FLOW (CFM)	1107.00	1107.00	1107.00	1107.00	1107.00	1107.00	1107.00	1107.00	1045.50	1045.50	1107.00	1076.25	1076.25	1070.10
ANN. VAC (inwg)	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5
Avg. Wind (MPH)	3.8	0	6.5	0	6.4	7.3	9.9	8.3	6.1	8.3	9.5	8	11.1	10.8
Wind Direct. (1)	332.4	80.1	142.8	181.8	274.3	275.6	277.4	278.9	290.1	285.3	289.2	276.6	280.5	287.4
BAR. PRESS (INHG)	29.041	29.083	29.13	29.103	29.11	29.097	29.088	29.039	28.993	28.931	28.88	28.791	28.727	28.713
T in (F)	38	39	39	40	46	42	42	40	40	39	46	50	40	40
T out (F)	59	58	58	58	60	59	58	58	59	58	59	60	59	58
Qp (BTU/min)	440.76	398.79	398.79	377.80	293.84	356.81	335.82	377.80	376.63	376.63	272.85	204.06	387.71	365.20
CAM (CPM)	275	300	300	300	300	300	300	350	350	375	400	375	375	450
INSULATING CO														
1	62	60	62	61	61	62	61	62	62	62	61	61	62	61
2	60	58	60	60	60	60	60	60	60	60	60	60	60	60
3	67	65	67	66	66	67	66	66	66	66	66	66	66	66
4	61	59	61	60	61	61	62	61	62	61	61	61	61	61
5	69	67	69	68	68	69	69	69	69	69	68	68	68	69
6	72	71	73	72	71	73	73	72	73	72	72	72	72	72
7	67	65	66	66	66	66	67	67	67	67	66	66	66	67
8														
9														
10	66	65	67	65	65	67	67	67	67	67	66	67	67	66
11	66	64	66	65	64	66	66	66	66	66	66	66	66	66
12	69	67	70	69	68	70	70	70	70	69	69	68	69	69
13	67	66	68	67	66	68	68	67	68	67	67	67	67	67
14	71	69	71	70	70	71	71	71	71	71	71	71	70	70
15	68	66	68	67	66	68	68	68	68	68	68	68	68	68
16	68	67	69	68	67	69	68	68	68	68	68	68	68	68
17	68	69	69	68	67	69	69	69	69	69	68	68	68	68
18														
19	68	69	69	68	68	69	68	69	69	69	68	68	68	68
20														
21	67	68	67	67	67	68	68	67	68	68	67	68	67	68

TEST NOTES: 1. Wind direction is degrees from North from which the wind is blowing. For example a wind direction of 270.0 degrees is a wind blowing from the West.	95	96	97	98	99	100	101	102	103	104	105	106	107	108
DATE	7-Feb-98				8-Feb-98									
TIME	22:15	1:15	4:15	7:15	10:15	13:15	16:15	19:15	22:15	1:15	4:15	7:15	10:15	13:15
ELAPSED TIME	370.25	373.25	376.25	379.25	382.25	385.25	388.25	391.25	394.25	397.25	400.25	403.25	406.25	409.25
FLOW (FPM)	850	900	870	825	800	875	850	870	850	890	900	800	800	825
FLOW (CFM)	1045.50	1107.00	1070.10	1014.75	984.00	1076.25	1045.50	1070.10	1045.50	1094.70	1107.00	984.00	984.00	1014.75
ANN. VAC (inwg)	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5
Avg. Wind (MPH)	10.2	8.9	4.3	0	7.7	5.8	9.3	12.1	4.2	1.7	7.9	3.7	4.4	20.7
Wind Direct. (1)	274	277.6	187.8	312.6	301.3	325.3	270.8	274.1	55.3	249.9	292.1	278.6	263.5	214.8
BAR. PRESS (INHG)	28.767	28.831	28.886	28.915	28.955	28.902	28.871	28.835	28.826	28.806	28.82	28.846	28.911	28.939
T in (F)	40	38	35	33	58	70	60	44	43	36	34	38	53	50
T out (F)	58	59	58	59	62	62	60	60	59	59	58	59	60	60
Qp (BTU/min)	356.81	440.76	466.65	500.23	74.63	-163.25	0.00	324.63	317.16	477.38	503.73	391.79	130.60	192.40
CAM (CPM)	380	350	320	390	400	400	390	300	350	370	420	420	400	400
INSULATING CO														
1	62	62	62	62	60	60	62	62	63	62	62	62	61	61
2	60	60	60	60	59	59	60	61	61	61	61	61	60	60
3	66	66	66	66	65	65	66	66	66	66	66	66	66	66
4	61	61	61	61	60	59	61	62	62	62	62	62	61	61
5	69	69	69	69	68	67	69	69	69	69	69	69	68	68
6	72	72	72	73	71	71	72	72	72	72	73	72	72	72
7	67	67	67	67	65	65	66	68	67	67	67	67	66	67
8														
9														
10	67	67	67	67	66	65	66	67	67	68	67	67	66	66
11	66	66	66	66	64	64	65	66	66	66	66	66	65	66
12	69	69	69	70	68	68	69	69	70	70	70	70	69	69
13	67	67	67	68	66	66	67	67	68	68	68	68	67	67
14	71	71	71	71	70	70	71	71	71	71	71	72	71	70
15	68	68	68	68	67	66	67	68	68	68	68	68	67	67
16	68	68	68	69	67	67	68	68	68	68	68	68	68	68
17	69	69	69	69	67	67	68	68	69	69	69	69	68	68
18														
19	68	68	68	69	67	67	68	68	69	69	69	69	68	68
20														
21	67	68	68	68	66	66	67	67	68	68	68	68	67	67

TEST NOTES: 1. Wind direction is degrees from North from which the wind is blowing. For example a wind direction of 270.0 degrees is a wind blowing from the West.															
	109	110	111	112	113	114	115	116	117	118	119	120	121	122	
DATE				9-Feb-98								10-Feb-98			
TIME	16:15	19:15	22:15	1:15	4:15	7:15	10:15	13:15	16:15	19:15	22:15	1:15	4:15	7:15	
ELAPSED TIME	412.25	415.25	418.25	421.25	424.25	427.25	430.25	433.25	436.25	439.25	442.25	445.25	448.25	451.25	
FLOW (FPM)	800	870	880	900	850	900	975	1100	1000	850	870	860	850	900	
FLOW (CFM)	984.00	1070.10	1082.40	1107.00	1045.50	1107.00	1199.25	1353.00	1230.00	1045.50	1070.10	1057.80	1045.50	1107.00	
ANN. VAC (inwg)	15.5	15.5	15.5	15.5	15.5	16	15.6	15.6	15.6	15.5	15.7	15.6	15.7	15.6	
Avg. Wind (MPH)	24.1	16.3	12.4	10.4	7.5	6.6	6.1	6.1	10.5	3.5	9	4.1	6.9	5.5	
Wind Direct. (1)	232.5	240.5	260.1	249	252.7	243.8	239.3	306.6	137.4	7.3	148.7	280.6	285.9	284.8	
BAR. PRESS (INHG)	28.995	29.07	29.139	29.203	29.256	29.316	29.369	29.376	29.354	29.367	29.358	29.334	29.289	29.247	
T in (F)	50	46	44	41	37	38	61	72	52	36	36	30	30	32	
T out (F)	50	59	59	58	58	58	62	62	62	59	58	57	57	58	
Qp (BTU/min)	0.00	263.76	307.83	356.81	416.28	419.77	22.74	-256.53	233.21	455.92	446.36	541.51	535.21	545.71	
CAM (CPM)	300	250	250	220	210	200	200	200	250	250	260	350	370	350	
INSULATING CO															
1	62	62	62	62	62	62	60	60	62	63	62	62	61	61	
2	61	61	61	61	61	61	60	59	60	62	61	61	60	60	
3	66	66	66	66	66	66	65	65	65	66	66	66	66	65	
4	62	63	62	62	62	61	60	60	61	62	62	62	61	61	
5	68	69	69	69	69	69	68	67	67	69	69	70	68	68	
6	72	72	72	72	72	72	71	70	71	72	72	72	72	72	
7	67	67	67	67	67	67	64	66	66	67	67	67	67	66	
8															
9															
10	67	67	67	67	67	67	63	65	66	67	67	67	67	67	
11	66	66	66	66	66	66	63	64	65	66	66	66	66	66	
12	69	69	69	70	70	69	66	68	68	69	70	70	69	69	
13	67	67	68	67	68	67	64	66	67	68	68	68	67	67	
14	71	71	71	71	71	71	68	69	70	71	71	71	71	71	
15	68	68	68	68	68	68	65	66	67	68	68	68	68	68	
16	68	68	68	68	68	68	65	67	67	68	68	68	68	68	
17	68	68	69	68	69	69	66	67	67	68	69	69	69	68	
18															
19	68	68	68	68	69	68	67	67	68	68	68	68	68	68	
20															
21	67	67	67	67	68	67	66	66	67	67	67	67	67	67	

TEST NOTES: 1.		123	124	125	126	TESTING COMPLETE	TEST AVERAGES (Does not include max vacuum testing)	MAXIMUM (Does not include max vacuum testing)	MINIMUM (Does not include max vacuum testing)
Wind direction is degrees from North from which the wind is blowing. For example a wind direction of 270.0 degrees is a wind blowing from the West.									
DATE									
TIME		10:15	13:15	16:37	17:07				
ELAPSED TIME		454.25	457.25	460.60	461.10				
FLOW (CFM)		800	850	0	0		875.44	1100.00	800.00
FLOW (CFM)		984.00	1045.50	0.00	0.00		1076.80	1353.00	984.00
ANN. VAC (inwg)		15.75	15.5	16.5	16.5		15.52	16.00	15.00
Avg. Wind (MPH)		9.5	4.7	0	0				
Wind Direct. (1)		283	5.4	147.7	250.8				
BAR. PRESS. (INHG)		29.234	29.212	29.194	29.198		29.05	29.38	28.69
T out (F)		32	49	42	41		41.48	72.00	27.00
T in (F)		58	60	59	58		58.85	77.00	50.00
Op (BTU/min)		485.07	218.05				351.03	708.95	-256.53
CAMF (CFM)		400	400	400	400		412.86	1100.00	110.00
INSULATING CO									
1		60	60					82.00	60.00
2		59	59					80.00	58.00
3		65	64					81.00	64.00
4		60	60					77.00	59.00
5		68	67					83.00	66.00
6		71	71					90.00	70.00
7		66	65					82.00	64.00
8									
9									
10		66	66					87.00	63.00
11		65	65					80.00	63.00
12		69	68					78.00	66.00
13		67	66					72.00	64.00
14		70	70					73.00	68.00
15		67	67					72.00	65.00
16		68	68					71.00	65.00
17		68	68					73.00	66.00
18									
19		68	68					71.00	67.00
20									
21		67	66					79.00	66.00

TEST NOTES: 1. Wind direction is degrees from North from which the wind is blowing. For example a wind direction of 270.0 degrees is a wind blowing from the West.	START-UP	1/21/98	9:50	1/22/98	3:40	6:30	15:30	23-Jan-98	24-Jan-98	SYSTEM AFTER RESTAR	(-)15.5 INWG, 800 FPM, DAMPER FULLY CLOSED T1=40, T2=58, TEST	10:45	13:45	16:45	19:45	22:45	25-Jan-98	(-)14 INWG, 800 FPM, T1=44, T2=57										
		7:00	2:83	18:17	18:67	30:50	36:17	21:10	7:45										44:75	47:75	50:75	53:75	56:75	59:75	62:75			
		22	70	71	71	70	71	70	71										70	71	70	69	70	70	71	71		
		23	69	69	70	70	70	71	70										71	70	70	69	70	70	70	70		
		24	70	70	71	71	70	71	70										71	70	70	69	70	70	70	70		
		25	70	71	71	71	71	71	71										72	71	71	70	71	71	71	72		
		TANK KNUCKLE	66	65	66	66	66	66	66										66	66	66	66	66	66	66	66	68	
		27	66	66	67	67	67	67	67										67	67	67	66	67	67	67	67	67	
		AIRLIFT CIRCULATORS	42 OS																									
		44 OS	66	68	68	66	66	66	66										66	66	66	66	65	65	66	66	66	
TREES	50 OS	75	75	75	75	75	74	74	75	73	73	73	73	73	73	73	74											
	59	72	73	72	72	72	72	72	72	72	71	72	72	72	72	72	72											
	62																											
	68 OS																											
	71 OS																											
	72 OS	78	78	76	76	75	74	75	74	73	73	73	72	72	72	72	72											

TEST NOTES: 1. Wind direction is degrees from North from which the wind is blowing. For example a wind direction of 270.0 degrees is a wind blowing from the West.	(1)15.5 INWAG, 950 FPM, T1=40, T2=59					(1)15.5 INWAG, 900 FPM, T1=31, T2=58									
DATE					26-Jan-98		2	3	4	5	6	7	8	9	10
TIME	4:45	7:45	10:45	13:45	4:45	7:45	10:45	13:45	16:45	19:45	22:45	1:45	4:45	7:45	
ELAPSED TIME	65.75	68.75	71.75	74.75	89.75	92.75	95.75	98.75	101.75	104.75	107.75	110.75	113.75	116.75	
22	70	70	70	70	70	70	70	70	69	70	70	70	70	70	70
23	70	70	69	69	70	69	69	69	69	69	69	69	69	69	69
24	70	70	70	69	69	69	69	69	69	69	69	69	69	69	69
25	71	71	71	71	71	71	71	72	71	71	71	71	71	71	71
TANK KNUCKLE															
26	66	66	66	66	66	66	66	67	65	66	66	66	66	66	66
27	67	67	66	66	66	67	66	67	65	66	66	67	67	66	66
AIRLIFT CIRCUL															
42															
44															
50	65	65	64	64	65	65	65	64	64	64	64	64	64	64	64
54															
59	73	73	73	72	72	72	72	72	71	71	71	71	71	71	71
TREES															
62	71	72	71	71	71	71	71	70	71	71	71	71	71	71	71
68															
71															
72															
73	71	71	71	71	70	71	69	68	68	68	69	68	68	68	68

TE DATA

TEST NOTES. 1. Wind direction is degrees from North from which the wind is blowing. For example a wind direction of 270.0 degrees is a wind blowing from the West.															
	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
DATE						28-Jan-98								29-Jan-98	
TIME	10:45	13:45	16:45	19:45	22:45	1:45	4:45	7:45	10:45	13:45	16:45	19:45	22:45	1:45	
ELAPSED TIME	119.75	122.75	125.75	128.75	131.75	134.75	137.75	140.75	143.75	146.75	149.75	152.75	155.75	158.75	
22	70	70	70	70	70	69	68	70	68	68	69	69	70	70	
23	69	69	69	69	69	70	70	69	67	68	68	69	69	69	
24	69	69	69	69	69	69	69	69	68	68	68	69	69	69	
25	71	70	70	71	71	71	71	71	70	69	70	70	71	70	
TANK KNUCKLE															
26	68	66	66	66	66	66	66	66	65	66	66	66	66	66	
27	67	67	66	67	67	66	66	66	65	67	66	66	66	66	
AIRLIFT CIRCUL															
42															
44															
50	64	64	64	64	65	64	64	64	63	63	63	64	64	64	
54															
59	70	71	71	71	71	71	71	71	70	70	71	71	71	71	
TREES															
62	71	71	71	72	72	71	72	71	70	70	71	71	71	71	
68															
71															
72															
73	68	68	68	68	68	68	68	67	66	66	66	67	67	66	

TE DATA

TEST NOTES: 1. Wind direction is degrees from North from which the wind is blowing. For example a wind direction of 270.0 degrees is a wind blowing from the West.														
	25	26	27	28	29	30	31	32	33	34	35	36	37	38
DATE								30-Jan-98						
TIME	4:45	7:45	10:45	13:45	16:45	19:45	22:45	1:45	4:45	7:45	10:45	13:45	16:45	19:45
ELAPSED TIME	161.75	164.75	167.75	170.75	173.75	176.75	179.75	182.75	185.75	188.75	191.75	194.75	197.75	200.75
22	70	69	69	70	69	69	70	70	68	69	68	68	70	70
23	68	68	68	69	68	69	69	69	68	69	68	68	69	69
24	69	69	68	68	68	69	69	69	68	69	68	68	69	69
25	70	70	70	71	70	70	71	70	70	71	69	70	70	71
TANK KNUCKLE														
26	66	66	66	66	66	66	66	66	66	66	65	66	66	67
27	66	66	66	66	66	66	66	66	66	66	66	66	66	67
AIRLIFT CIRCUL														
42														
44														
50	64	64	64	64	63	64	64	64	63	64	63	62	64	64
54														
59	71	70	70	71	71	71	71	71	70	70	69	70	70	71
TREES														
62	71	71	71	71	71	71	71	71	71	71	70	70	71	71
68														
71														
72														
73	66	66	66	67	66	67	67	66	66	66	66	66	67	67

TE DATA

TEST NOTES: 1. Wind direction is degrees from North from which the wind is blowing. For example a wind direction of 270.0 degrees is a wind blowing from the West.														
	39	40	41	42	43	44	45	46	47	48	49	50	51	52
DATE	31-Jan-98										1-Feb-98			
TIME	22:45	1:45	4:45	7:45	10:45	13:45	16:45	19:45	22:45	1:45	4:45	7:45	10:45	13:45
ELAPSED TIME	203.75	206.75	209.75	212.75	215.75	218.75	221.75	224.75	227.75	230.75	233.75	236.75	239.75	242.75
22	70	68	70	69	68	68	68	69	69	69	69	68	68	69
23	69	68	68	68	67	67	70	69	68	68	68	68	67	67
24	69	68	69	68	67	67	68	68	68	68	68	67	67	67
25	71	70	71	71	69	68	69	70	70	70	70	70	70	69
TANK KNUCKLE														
26	66	66	67	66	65	66	66	66	66	66	66	66	66	65
27	67	66	67	66	65	66	66	66	66	66	66	66	66	65
AIRLIFT CIRCUL														
42														
44														
50	64	63	63	63	62	62	63	63	63	63	63	63	62	62
54														
59	71	70	70	69	69	69	70	69	70	70	70	69	69	68
TREES														
62	71	71	71	71	69	69	70	70	70	70	70	70	69	69
68														
71														
72														
73	67	66	66	66	65	64	66	66	65	66	66	63	64	64

TEST NOTES: 1. Wind direction is degrees from North from which the wind is blowing. For example a wind direction of 270.0 degrees is a wind blowing from the West.															
	53	54	55	56	57	58	59	60	61	62	63	64	65	66	
DATE				2-Feb-98								3-Feb-98			
TIME	16:45	19:45	22:45	1:45	4:45	7:45	10:45	13:45	16:45	19:45	21:45	1:45	4:45	7:45	
ELAPSED TIME	245.75	248.75	251.75	254.75	257.75	260.75	263.75	266.75	269.75	272.75	274.75	277.75	280.75	283.75	
22	69	69	69	69	68	69	68	67	69	69	68	68	69	68	
23	68	68	68	68	68	68	67	68	68	68	68	68	68	67	
24	67	68	68	68	68	68	67	68	68	68	68	68	68	67	
25	69	70	70	70	70	70	70	70	70	70	70	70	70	69	
TANK KNUCKLE															
26	64	66	66	66	66	66	66	66	66	66	66	66	66	65	
27	66	66	66	66	66	66	66	66	66	67	66	66	66	66	
AIRLIFT CIRCUL															
42															
44															
50	62	63	63	63	63	62	61	63	63	63	63	62	63	61	
54															
59	69	69	69	69	69	69	69	69	69	69	69	69	69	68	
TREES															
62	70	70	70	70	70	70	69	70	70	70	70	70	70	69	
68															
71															
72															
73	64	65	65	65	65	65	64	65	65	65	65	65	65	69	

TE DATA

TEST NOTES: 1. Wind direction is degrees from North from which the wind is blowing. For example a wind direction of 270.0 degrees is a wind blowing from the West.														Possible false reading		
	67	68	69	70	71	72	73	74	75	76	77	78	79		80	
	4-Feb-98														5-Feb-98	
	10:45	13:45	16:15	19:15	22:15	1:15	4:15	7:15	10:15	13:15	16:15	19:15	22:15		1:15	
	286.75	289.75	292.25	295.25	298.25	301.25	304.25	307.25	310.25	313.25	316.25	319.25	322.25		325.25	
	22	68	68	68	68	68	67	67	69	67	67	66	68		68	68
	23	67	67	67	67	67	67	68	68	67	68	67	68		68	67
	24	67	67	67	69	69	69	67	66	66	67	66	68		67	67
	25	69	70	69	66	66	65	70	68	68	66	68	70		70	69
	TANK KNUCKLE															
	26	65	66	64	66	66	66	66	64	65	65	64	65		66	64
	27	66	66	65	66	66	66	66	64	65	64	64	66		66	65
	AIRLIFT CIRCUL															
	42															
	44															
50	62	62	62	62	62	62	61	60	61	62	61	62	62	60		
54																
59	68	69	68	69	68	68	68	67	68	68	68	69	68	67		
TREES																
62	69	69	69	69	69	69	68	68	69	69	69	70	69	69		
68																
71																
72																
73	64	64	64	64	64	64	63	64	64	64	64	65	65	65		

TE DATA

TEST NOTES: 1. Wind direction is degrees from North from which the wind is blowing. For example a wind direction of 270.0 degrees is a wind blowing from the West.															
	81	82	83	84	85	86	87	88	89	90	91	92	93	94	
DATE								6-Feb-98							
TIME	4:15	7:15	10:15	13:15	16:15	19:15	22:15	1:15	4:15	7:15	10:15	13:15	16:15	19:15	
ELAPSED TIME	328.25	331.25	334.25	337.25	340.25	343.25	346.25	349.25	352.25	355.25	358.25	361.25	364.25	367.25	
22	68	68	69	67	67	68	68	68	69	69	68	68	68	68	
23	67	68	68	68	68	68	68	68	68	68	67	67	67	66	
24	67	68	68	67	67	67	67	67	67	67	67	67	67	67	
25	69	70	70	66	69	69	69	69	69	69	69	69	69	69	
TANK KNUCKLE															
26	65	66	66	65	65	66	66	66	66	66	66	65	65	65	
27	66	66	66	66	66	66	66	66	66	66	66	66	66	65	
AIRLIFT CIRCUL															
42															
44															
50	62	63	62	62	63	63	63	63	62	62	62	62	62	63	
54															
59	69	69	69	68	68	69	69	69	69	69	68	69	69	69	
TREES															
62	69	70	70	69	70	70	70	70	70	70	69	70	70	70	
68															
71															
72															
73	64	65	65	64	65	65	65	65	65	65	65	65	64	65	

TE DATA

TEST NOTES: 1. Wind direction is degrees from North from which the wind is blowing. For example a wind direction of 270.0 degrees is a wind blowing from the West															
	95	96	97	98	99	100	101	102	103	104	105	106	107	108	
DATE	7-Feb-98										8-Feb-98				
TIME	22:15	1:15	4:15	7:15	10:15	13:15	16:15	19:15	22:15	1:15	4:15	7:15	10:15	13:15	
ELAPSED TIME	370.25	373.25	376.25	379.25	382.25	385.25	388.25	391.25	394.25	397.25	400.25	403.25	406.25	409.25	
22	68	69	69	69	67	67	68	68	68	69	69	69	68	68	
23	67	67	68	68	66	66	67	67	67	68	68	68	66	67	
24	67	67	67	67	66	65	67	67	67	67	68	67	66	67	
25	69	69	69	70	68	67	69	69	69	68	70	69	68	68	
TANK KNUCKLE															
26	66	66	66	66	64	64	65	66	66	66	66	66	65	65	
27	66	66	66	66	64	64	65	66	66	66	66	66	65	65	
AIRLIFT CIRCUL															
42															
44															
50	62	62	62	62	65	65	62	62	62	63	63	63	62	62	
54															
59	69	69	69	69	68	68	68	69	69	69	69	69	68	69	
TREES															
62	70	70	70	70	69	69	69	69	70	70	70	70	69	69	
68															
71															
72															
73	65	65	65	65	64	64	64	65	65	65	65	65	64	64	

TE DATA

TEST NOTES: 1. Wind direction is degrees from North from which the wind is blowing. For example a wind direction of 270.0 degrees is a wind blowing from the West.															
	109	110	111	112	113	114	115	116	117	118	119	120	121	122	
DATE				9-Feb-98								10-Feb-98			
TIME	16:15	19:15	22:15	1:15	4:15	7:15	10:15	13:15	16:15	19:15	22:15	1:15	4:15	7:15	
ELAPSED TIME	412.25	415.25	418.25	421.25	424.25	427.25	430.25	433.25	436.25	439.25	442.25	445.25	448.25	451.25	
22	68	68	68	69	69	68	68	67	67	68	68	68	68	68	
23	67	67	67	68	68	67	66	66	66	67	67	67	67	67	
24	67	67	72	67	67	67	66	66	66	67	67	67	67	67	
25	68	68	69	69	69	69	68	68	68	69	69	69	69	69	
TANK KNUCKLE															
26	65	66	66	66	66	66	64	64	65	66	66	66	66	66	
27	66	66	66	66	66	66	65	64	65	66	66	66	66	65	
AIRLIFT CIRCUL															
42															
44															
50	63	62	62	62	62	62	61	60	61	62	62	62	62	62	
54															
59	69	69	69	69	69	69	68	68	68	69	69	69	69	69	
TREES															
62	69	69	70	70	70	70	69	68	68	70	70	70	70	69	
68															
71															
72															
73	64	65	65	65	65	65	64	64	65	65	66	66	65	65	

TEST NOTES: 1. Wind direction is degrees from North from which the wind is blowing. For example a wind direction of 270.0 degrees is a wind blowing from the West.	123	124	125	126	TEST AVERAGES (Does not include max. vacuum testing)	MAXIMUM (Does not include max. vacuum testing)	MINIMUM (Does not include max. vacuum testing)
DATE							
TIME	10:15	13:15	16:37	17:07			
ELAPSED TIME	454.25	457.25	460.60	461.10			
22	68	68				77.00	66.00
23	67	67				71.00	66.00
24	66	66				72.00	66.00
25	68	68				72.00	66.00
TANK KNUCKLE							
26	65	65				66.00	64.00
27	65	65				66.00	64.00
AIRLIFT CIRCUL							
42							
44							
50	62	61				79.00	60.00
54							
59	68	68				75.00	67.00
TREES							
62	69	69				73.00	68.00
68							
71							
72							
73	64	66				78.00	63.00

APPENDIX D

OTP-320-001, REV A-0, SIGN-OFFS, AND ASSOCIATED PROCEDURE CHANGE AUTHORIZATION FORMS

W-320 ANNULUS VENTILATION SYSTEM
OPERATIONAL TEST

Last Full Revision: A-0

Release Date: 1/19/98

USQ Screening Number: TF-97-1005

Approval Designator: ESQ

POSITION/ORG	DELEGATE	DATE
NPO	<u>R. Garcia</u>	<u>1/19/98</u>
DST Shift Manager	<u>K.J. Anderson</u>	<u>1/19/98</u>
QA Engineer	<u>C.A. Sams</u>	<u>1/16/98</u>
Safety Engineer	<u>S.U. Zaman</u>	<u>1/15/98</u>
Environmental Eng.	<u>P.C. Miller</u>	<u>1/16/98</u>
RadCon Engineer	<u>J. Pieper</u>	<u>1/16/98</u>
COG Engineer	<u>J.M. Jones</u>	<u>1/16/98</u>
Design Authority	<u>W.J. Powell</u>	<u>1/19/98</u>
Acceptance Review	<u>D.C. Ashworth</u>	<u>1/19/98</u>
Approval Authority	<u>R.A. Dodd</u>	<u>1/19/98</u>

Justification: To test W-320 changes to 241-AY-102 ventilation system

Summary of Changes: New procedure

HNF-2317

Rev 0

Page D-2

TABLE OF CONTENTS

PAGE

1.0	PURPOSE AND SCOPE	3
1.1	PURPOSE	3
1.2	SCOPE	3
2.0	INFORMATION	4
2.1	TERMS AND DEFINITIONS	4
2.2	RESPONSIBILITIES	4
2.3	REFERENCES	6
2.4	GENERAL INFORMATION	6
2.5	RECORDS	9
3.0	PRECAUTIONS AND LIMITATIONS	10
3.1	RADIATION AND CONTAMINATION CONTROL	10
3.2	ENVIRONMENTAL COMPLIANCE	10
3.3	LIMITS	11
4.0	PREREQUISITES	15
4.1	SPECIAL TOOLS, EQUIPMENT, AND SUPPLIES	15
4.2	PERFORMANCE DOCUMENTS	15
4.3	CONDITIONS AND ACTIONS	15
5.0	PROCEDURE	18
5.1	INITIAL CONDITIONS	18
5.2	TEST ANNULUS FLOW	18
5.3	RESTORATION	25
5.4	SYSTEM RECOVERY PLAN	25
	ATTACHMENT 1, OTP-320-001 TEST LOG	26
	ATTACHMENT 2, OTP-320-001 TEST EXCEPTION REPORT	27
	ATTACHMENT 3, OTP-320-001 SIGNATURE LOG	28
	ATTACHMENT 4, VENTILATION SYSTEM DATA SHEET	29
	ATTACHMENT 5, TEMPERATURE DATA SHEET	31
	FIGURE 1 - W-320 ANNULUS VENTILATION OTP TEST LOGIC	33
	FIGURE 2 - W-320 ANNULUS VENTILATION SYSTEM SCHEMATIC	34

HNF-2317

Rev 0

Page D-3

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	OTP-320-001	A-0	1/19/98	2 of 34

1.0 PURPOSE AND SCOPE

1.1 PURPOSE

This procedure provides instructions for Operational Testing of the W-320 Annulus Ventilation System to verify the system will perform adequately to ensure sufficient heat removal capacity in Tank 241-AY-102 after W-320 sluicing. Additionally, this test will demonstrate that ventilation system modifications have satisfactorily eliminated cross connections between the primary and annulus ventilation systems. Specifically, the intent of this testing is to measure and record annulus vacuum and flow parameters from startup to maximum vacuum (less than 14 inWG) as follows:

- vacuum will be increased and system data recorded in 0.5 inWG increments up to a system vacuum of 4 inWG,
- above 4 inWG, vacuum will be increased and system data recorded in 1 inWG increments,
- once system design operating flow velocity and configuration are established, temperature element and system operating data shall be recorded for 10 days,
- after 10 days of data acquisition, vacuum levels shall will be increased to maximum vacuum in 1 inWG increments.

1.2 SCOPE

This procedure involves all equipment and instrumentation specific to Tank AY-102 Annulus Ventilation.

Data recorded during testing will allow the following design functions to be verified:

- Annulus ventilation system performance.
- Annulus ventilation system boundary integrity.

HNF-2317
Rev 0
Page D-4

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	OTP-320-001	A-0	1/19/98	3 of 34

2.0 INFORMATION

2.1 TERMS AND DEFINITIONS

- 2.1.1 DST - Double Shell Tank
- 2.1.2 CAM - Continuous Air Monitor
- 2.1.3 FPM - Feet Per Minute
- 2.1.4 HEPA - High Efficiency Particulate Air

2.2 RESPONSIBILITIES

- 2.2.1 Joint Test Review Group - consisting of; Chief Test Director, Operations Test Director, W-320 Project Manager, DST Engineering Manager and the Design Authority:

- Conducts thorough reviews of test procedures to ensure they can be done safely.
- Conducts thorough reviews of test procedures to ensure compliance with applicable procedure requirements and adequately demonstrate accomplishment of test objectives.
- Conducts thorough reviews of test plans to ensure the scope of testing and inspections provide a product that satisfies operational and safety requirements.

- 2.2.2 Craft (TWRS Maintenance and/or Construction Forces):

- Provide assistance during OTP testing.
- Provide equipment for the performance of this OTP.

- 2.2.3 Test Engineer:

- Provide technical support during testing.
- Provide programming support during testing.
- Review test documents to validate acceptance.
- Record equipment status and data per this procedure.
- Record data exceptions and other notes as required on the OTP Data Sheets.
- Prepare post testing documents.

- 2.2.4 Health Physics Technician

- Operation and monitoring of CAM.

2.2 RESPONSIBILITIES (Cont.)

2.2.5 Test Director:

- Overall control of the testing process and change record authorization for this OTP.
- Ensures all required data is collected.
- Safe and productive accomplishment of testing.
- Ensure safe working conditions and practices.
- Ensure compliance with test documents and Technical Safety Requirements/Documents (TSRs/OSDs) during testing.
- Communicate and coordinate testing with DST Shift Manager.
- Ensures review and approval of all modifications to test procedures are completed prior to return to testing.
- Act as a direct line of communication and centralized point of control during normal, abnormal, and casualty situations.
- Conduct pretest briefings as required.
- Schedule/reschedule tests as required.
- Conduct pre-job system walkdowns.
- Review test documents to validate acceptance.
- Verify all test instrumentation is within current calibration cycle.

2.2.6 Operations:

- Operate annulus test damper T-V-1.
- Operate and Monitor Annulus ventilation system.
- Monitor CAM radiation recorder.
- Record test data as required.

2.2.7 Quality Control Inspector:

- Verifies prerequisites completeness prior to start of test.
- Review recorded test data for accuracy and completeness at completion of test.

2.3 REFERENCES

- 2.3.1 H-2-64462, Sht 1, "Ventilation Equipment Schedules & Control Diagram"
- 2.3.2 TO-060-121, "Operate TK-241-AY-102 Annulus Ventilation System."
- 2.3.3 ECN 645848L, "Tank 241-AY-102 Annulus Ventilation Test."
- 2.3.4 ECN 645839, "Tank AY-102 Annulus Instm Upgrades."
- 2.3.5 ECN 611046, "241-AY-102, K2-4-1 Heater Housing Fabrication."

2.4 GENERAL INFORMATION

2.4.1 CHANGE CONTROL

- 2.4.1.1 Change control shall be in accordance with HNF-IP-0842.
- 2.4.1.2 The Joint Test Review Group shall concur with all changes, except editorial to this procedure. Concurrence shall be documented in the test log.

2.4.2 EXCEPTIONS

- 2.4.2.1 Test exceptions are used to document unexpected results and identify appropriate actions, not to circumvent performance requirements.
- 2.4.2.2 All test exceptions shall be given a sequential number and recorded on Attachment 1, OTP-320-001 TEST LOG.
- 2.4.2.3 Attachment 2, OTP-320-001 TEST EXCEPTION REPORT, shall be filled out to record and disposition each test exception.

HNF-2317
Rev 0
Page D-7

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	OTP-320-001	A-0	1/19/98	6 of 34

2.4 GENERAL INFORMATION (Cont.)

2.4.3 ALARM RESPONSE

- 2.4.3.1 This procedure identifies all alarms expected as a result of testing and provides instructions for responding to those alarms.
- 2.4.3.2 Existing alarm response procedures shall be used when responding to unexpected alarms which occur during testing.
- 2.4.3.3 Unexpected alarms received during testing shall be logged as test exceptions and evaluated by the Test Director for effect on the test.

2.4.4 The flow velocity shall not be allowed to go below 700 FPM during performance of this procedure.

2.4.5 Contact Test Director and Test Engineer for additional instructions if changing plant conditions affect testing or delays extend test duration past end of the (testing) shift.

2.4.6 If during performance of this procedure, any of the following conditions are found, **IMMEDIATELY** notify the assigned Test Director and Test Engineer:

- Any equipment malfunction which could prevent fulfillment of functional requirements.
- Personnel error or procedural inadequacy which could prevent fulfillment of procedural requirements.
- Any other unexpected anomalies.

Test Director shall assess the effect on the plant and the test and direct either continuation of the test in the same section, proceeding to another attachment or section of the test, or suspension of the test per step 2.4.12 and establishing a safe condition for equipment.

2.4.7 Comply with the Hanford Site Wide Lock and Tag policy requirements, HNF-IP-0842, Vol. II, Section 4.9.1.

HNF-2317

Rev 0

Page D-8

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	OTP-320-001	A-0	1/19/98	7 of 34

2.4 GENERAL INFORMATION (Cont.)

- 2.4.8 If at anytime during test PI-102-AY exceeds 14 inWG:
- Notify Test Director and Test Engineer.
 - Test Director and Test Engineer shall assess current ventilation system configuration.
 - Test Director shall direct either continued testing, or suspension of test and proceeding to Section 5.3, "RESTORATION".
- 2.4.9 All Measuring and Test Equipment (M&TE) used during performance of this procedure to collect qualitative data, with the exception of "timing devices", shall meet the following requirements:
- Be within its current calibration cycle as evidenced by an affixed calibration label.
 - Be capable of the desired range.
 - Have an accuracy (consistent with state-of-the-art limitations) equal to or greater than the accuracy specified in the procedure.
- 2.4.10 Timing measurements shall be made with commercially available timing devices.
- 2.4.11 SYSTEM STATUS
- 2.4.11.1 Record all changes in equipment configuration, system pressures and flows, comments and observations by participants, and all other data pertinent to the test on Attachment 1, OTP-320-001 TEST LOG.
- 2.4.11.2 Operations shall complete all normal ROUNDS DATA SHEETS (not part of this procedure) throughout performance of this procedure.

HNF-2317

Rev 0

Page D-9

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	OTP-320-001	A-0	1/19/98	8 of 34

2.4 GENERAL INFORMATION (Cont.)

2.4.12 SUSPENSION OF TEST AND RESUMING TEST

- 2.4.12.1 Test Director may unilaterally, for any reason, stop testing, and shut down the ventilation system in accordance with T0-060-121, "Operate TK-241-AY-102 Annulus Ventilation System." All suspension of testing shall be documented on Attachment 1, OTP-320-001 TEST LOG.
- 2.4.12.2 The Joint Test Review Group shall be notified of unplanned test stoppage and shall concur with resumption of testing. Concurrence shall be documented on Attachment 1, OTP-320-001 TEST LOG.
- 2.4.12.3 If a section of the test is suspended for any reason prior to completing all steps, the Test Director shall establish initial conditions necessary to resume testing for that section. Previously completed sections need not be repeated unless directed by the Test Director to establish conditions required to resume the test.

2.5 RECORDS

- 2.5.1 The performance copy of the OTP and all completed attachments shall be filed as a permanent test record (Operational Test Report).

HNF-2317

Rev 0

Page D-10

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	OTP-320-001	A-0	1/19/98	9 of 34

3.0 PRECAUTIONS AND LIMITATIONS

3.1 RADIATION AND CONTAMINATION CONTROL

3.1.1 CAM 102-AY shall be monitored continuously during changes to annulus ventilation system flow and vacuum levels, and for 60 minutes after changes have been completed.

3.1.1.1 Past experience shows that when the annulus ventilation system has been shut down for an extended period of time, high levels of radon gas accumulate in the annulus. These radon levels result in high activity readings on the CAM at startup, and may persist for several days before CAM levels normalize below 450 CPM. HPT support must be obtained to verify high CAM readings are the result of radon.

NOTE - Approval process must be started in time to ensure approval for continued operation is "in-hand" at 48 hours.

3.1.1.2 IF CAM levels have not settled below 550 CPM within 48 hours of startup, THEN approval for continued operation must be obtained from Joint Test Review Group.

3.1.1.3 If at anytime during testing (except system start-up when high radon levels are anticipated) should CAM readings indicate ≥ 550 cpm, then testing shall be stopped IMMEDIATELY, and the Test Director notified.

3.2 ENVIRONMENTAL COMPLIANCE

3.2.1 Tank Farm ventilation systems and exhaust monitoring systems are regulated under Washington State Administrative Code (WAC) Chapters 173-400, 173-401, 173-460 and 246-247 and applicable Notices of Construction (NOC) issued to ensure compliance with these regulations. To ensure reporting requirements are met, all planned and unplanned outages of Tank Farm ventilation and exhaust monitoring systems, including portable exhausters, must be immediately reported to Environmental Operations Compliance (EOC). EOC shall determine and make the required notifications pertaining to ventilation system outages.

HNF-2317

Rev 0

Page D-11

Type	Document No.	Rev/NO	Release Date	Page
CONTINUOUS	OTP-320-001	A-0	1/19/98	10 of 34

3.3 LIMITS

HNF-SD-WM-TSR-006, Rev 0-D, Tank Waste Remediation System Technical Safety Requirements.

- BIO-TSR-LCO 3.2.6 One of the two primary leak detection systems listed below shall be OPERABLE:

The annulus conductivity probe system

OR

The annulus continuous air monitor (CAM) system

Mode Applicability: Operation and Limited.

Process Area Applicability: DSTs and AWF tanks

- BIO-TSR-LCO 3.3.3 Tank 241-AY-102 annulus ventilation system shall be OPERABLE.

Mode Applicability: Operation and Limited.

Process Area Applicability: Tank 241-AY-102 after ≥ 2 ft of sludge from the Tank 241-C-106 has been transferred to the Tank 241-AY-102.

- BIO-TSR-AC 5.18 HEPA Filter Controls:

BIO-TSR-AC 5.18.2.a: Program Key Elements

VERIFY periodically that the HEPA and HEGA (for AWF) filter and prefilter housing radiation level is ≤ 200 mrem/h on contact. Replace the HEPA and HEGA (for AWF) filters and prefilters before filter housing radiation levels exceed 200 mrem/h.

HNF-2317
Rev 0
Page D-12

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	OTP-320-001	A-0	1/19/98	11 of 34

3.3 LIMITS (Cont.)

- BIO-TSR-AC 5.19 Process Instrumentation and Measuring and Test Equipment

BIO-TSR-AC 5.19.2 Program Key Elements

Identification and traceability of TSR-related instrumentation and equipment shall be maintained.

Instrumentation and equipment shall either have a FUNCTIONAL TEST or CALIBRATION as applicable at appropriate intervals to VERIFY required performance.

Records shall be maintained to provide evidence that the instrumentation and equipment are within the FUNCTIONAL TEST or CALIBRATION when used.

- BIO-TSR-AC 5.25 Ventilation Controls

BIO-TSR-AC 5.25.2 Program Key Elements

Perform an external visual inspection of the above-ground recirculation ventilation ductwork for Tank 241-C-106 to identify any obvious visual damage every 24 hours during operation of recirculation fan FN 1361. The recirculation ventilation ductwork for Tank 241-C-106 includes the ductwork within Process Building 241-C-91, the inlet duct, and return duct to the tank. Monitor and evaluate ventilation flow data during operation of FN 1361 to determine if any recirculation losses are occurring.

Periodically determine the cooling capacity required for Tank 241-AY-102 ventilation system to maintain WASTE temperatures in accordance with the requirements of LCS/LCO 3.3.2. This determination shall be based on a heat balance developed from the tank WASTE temperature and liquid level; and ventilation parameters such as flow rate, temperature and humidity, as applicable, including planned activities that could impact the cooling requirements. Provide the necessary cooling capability before each campaign to transfer two feet of Tank 241-C-106 sludge to Tank 241-AY-102.

HNF-2317

Rev 0

Page D-13

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	OTP-320-001	A-0	1/19/98	12 of 34

3.3 LIMITS (Cont.)

- OSD-T-151-00007.2.2 LIQUID LEVELS: Specification Limit

<u>Variable</u>	<u>Tanks</u>	<u>Specification Limit</u>
a. Primary Tank Liquid Level***	AN, AP, AW and SY	Min: 6 in.**
	AY, AZ	Min: 64 in.*

 - * When the annulus ventilation system is operating. When the annulus ventilation system is not operating, the absolute minimum liquid level required is that level necessary to meet the hydrostatic head limitation discussed in OSD-T-151-00017 Para. 17.2.1.1.
 - ** The ventilation system shall not be operated unless the liquid level is 6 in. ~~Limiting Condition of Operation (LCO).~~
 - *** Liquid level is defined as the surface level irrespective of the amounts of sludge, supernate or solids/crust.
- OSD-T-151-00016.3.1 ANNULUS VENTILATION: Specification Limit

The Annulus Ventilation System shall not be operated when the primary tank liquid level is less than 64 inches.
- OSD-T-151-00016.3.2.1 HEPA FILTRATION: Specification Limit

Exhausts shall pass through two stages of HEPA filters (when the ventilation system is operating).
- OSD-T-151-00016.3.2.2 PRESSURE DROP ACROSS HEPA FILTERS: Specification Limit

Pressure drop across first filter in a series ≤ 5.9 inWG.

Pressure drop across any other filter ≤ 4.0 inWG.

Total pressure drop across filters in a series ≤ 5.9 inWG.
- OSD-T-151-00016.3.2.3 PARTICULATE REMOVAL: Specification Limit

$\geq 99.95\%$ of particles between 0.3um and 5.0um, and of average size 0.5um.

HNF-2317
Rev 0
Page D-14

3.3 LIMITS (Cont.)

• OSD-T-151-00016.3.3

<u>Variable</u>	<u>Specification Limit</u>
A. Discharges - average concentration of any constituent over a 12 month period.	The annual average concentration of radionuclides released to the environment shall not exceed the Administrative Control Value (ACV) of 1 times the Derived Concentration Guides (DCG) value specified in Appendix C of WHC-CM-7-5.
B. Sampling Systems	Exhaust gases shall be sampled continuously for particulate activity.
C. Monitoring Systems	Exhaust gases shall be monitored continuously for gross beta/gamma activity.
D. Alarm Systems	Visible and audible alarms shall be provided, set to concentration levels less than four times the ACV stated in WHC-CM-7-5.

HNF-2317

Rev 0

Page D-15

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	OTP-320-001	A-0	1/19/98	14 of 34

4.0 PREREQUISITES

4.1 SPECIAL TOOLS, EQUIPMENT, AND SUPPLIES

The following supplies may be needed to perform this procedure:

- Means of communication between control room and equipment locations (i.e. radios/cell phones).
- Thermometer or temperature indicator for measuring ambient temperature at tank farm testing location.

4.2 PERFORMANCE DOCUMENTS

The following procedures may be needed to perform this procedure:

- TO-060-121, "Operate TK-241-AY-102 Annulus Ventilation System."
- ARP-T-211-00001, "Respond To Panel 3 Alarms At 271-A Control Building"

4.3 CONDITIONS AND ACTIONS

NOTE: Steps 4.3.1 through 4.3.14 may be performed in any order.

4.3.1 CONDUCT a pretest briefing for all personnel involved in the performance of this OTP.

- A daily pre-job briefing shall be performed by the Test Director and documented in Attachment 1, OTP-320-001 TEST LOG.

TEST DIRECTOR INITIALS/DATE: 1-21-98

NOTE: LCO 3.2.6 requires only one of two primary leak detection systems be operable. For the performance of this test, the functional testing identified in Step 4.3.2 must demonstrate BOTH conductivity probe system and CAM are operational.

4.3.2 ENSURE annulus leak detection functional testing (TF-FT-259-008) has been performed within the previous 150 days.

TEST DIRECTOR INITIALS/DATE: 1-23-98

4.3.3 ENSURE annulus exhaust CAM sample collection paper has been replaced within the last seven days.

TEST DIRECTOR INITIALS/DATE: 1-23-98

HNF-2317

Rev 0

Page D-16

4.3 CONDITIONS AND ACTIONS (Cont.)

- 4.3.4 ENSURE annulus pump out pit 02F is isolated from primary vent space.

TEST DIRECTOR INITIALS/DATE: JK 11-20-98

- 4.3.5 VERIFY HPT support availability AND NOTIFY HPT of need to verify high CAM readings anticipated at start up are the result of radon.

TEST DIRECTOR INITIALS/DATE: JK 11-21-98

- 4.3.6 PERFORM a walkdown inspection of the TK-241-102-AY annulus ventilation systems tested by this OTP.

TEST DIRECTOR INITIALS/DATE: JK 11-20-98

- 4.3.7 ESTABLISH communication between control room and equipment locations.

TEST DIRECTOR INITIALS/DATE: JK 11-20-98

- 4.3.8 ENSURE the official OTP copy and all other photocopies to be used during testing are the latest approved revision.

TEST DIRECTOR INITIALS/DATE: JK 11-20-98

- 4.3.9 REVIEW LOCK & TAG LOGBOOK to verify all components are available for the test.

TEST DIRECTOR INITIALS/DATE: JK 11-20-98

NOTE - Signature Log requirement is ongoing as new individuals become involved in the procedure.

- 4.3.10 ENSURE all personnel to be involved with performance of this procedure have completed Attachment 3, OTP-320-001 SIGNATURE LOG.

TEST DIRECTOR INITIALS/DATE: JK 11-21-98

- 4.3.11 ENSURE installed instrumentation listed as requiring calibration on Attachment 4, Ventilation System Data Sheet is within current calibration cycle with calibration stickers affixed.

TEST DIRECTOR INITIALS/DATE: JK 11-20-98

HNF-2317

Rev 0

Page D-17

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	OTP-320-001	A-0	1/19/98	16 of 34

4.3 CONDITIONS AND ACTIONS (Cont.)

- 4.3.12 ENSURE Environmental Compliance Officer notified of startup of TK-241-AY-102 Annulus Ventilation System. ¹⁻²¹⁻⁹⁸

TEST DIRECTOR INITIALS/DATE: HA 1-21-98

- 4.3.13 ENSURE annulus test damper T-V-1 is installed in riser location 19B.

TEST DIRECTOR INITIALS/DATE: 1-20-98 HA

- 4.3.14 ENSURE all TK-241-102-AY pit covers are in place:

- 02A • 02B
- 02C • 02D
- 02E • 02F

TEST DIRECTOR INITIALS/DATE: HA 1-20-98

- 4.3.15 VERIFY Project W-030 operating conditions are compatible with operations conducted under OTP-320-001.

TEST DIRECTOR INITIALS/DATE: HA 1-21-98

- 4.3.16 All steps in Section 4.0 have been signed off as complete by the Test Director.

QC SIGNATURE/DATE: M. S. Wingfield 1/21/98

HNF-2317
Rev 0
Page D-18

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	OTP-320-001	A-0	1/19/98	17 of 34

5.0 PROCEDURE

- Note - Figure 1 and Figure 2 provide graphical representation of the test logic and a system schematic.
- Note - Attachment 4, VENTILATION SYSTEM DATA SHEET, and Attachment 5, TEMPERATURE DATA SHEET may be reproduced as required.
- Note - 271-A Alarm Panel 3, Alarm 8-3 "102-AY Annulus Vent System Failure" and CASS Alarm 1167 are expected to alarm repeatedly throughout this procedure and may be ignored.

5.1 INITIAL CONDITIONS

- 5.1.1 POSITION annulus test damper T-V-1 to FULL OPEN.
- 5.1.2 START annulus ventilation system per TO-60-121.
- 5.1.3 LOCK Ventilation Storm damper (K2-MK-6301) to FULL OPEN.
- 5.1.4 RESET Fan Inlet Control damper (MK-6302) to FULL OPEN.
- 5.1.5 ALLOW system to operate for 60 minutes.
- 5.1.6 RECORD data per Attachment 4, VENTILATION SYSTEM DATA SHEET.
- 5.1.7 RECORD data per Attachment 5, TEMPERATURE DATA SHEET.

5.2 TEST ANNULUS FLOW

- 5.2.1 IF at any time, annulus vacuum (PI-102-AY) exceeds 14 inWG, THEN STOP testing, AND NOTIFY Test Director.
- 5.2.2 MONITOR TK-241-102-AY vacuum (PR-102-1) continuously during changes to annulus ventilation system flow and vacuum levels, and for 60 minutes after changes have been completed.
 - 5.2.2.1 IF at any time, TK-241-102-AY vacuum (PR-102-1) increases by more than 0.5 inWG from initial value, THEN STOP all changes to the system immediately, AND NOTIFY Test Director.
 - 5.2.2.2 Test Director: EVALUATE AND DETERMINE cause of change.
 - A. IF change is due to change in primary system configuration, THEN RECORD new primary tank vacuum on Attachment 4 AND CONTINUE testing.
 - B. IF reason for change is unclear, THEN GO TO Section 5.3, "RESTORATION", OR Section 5.4, "SYSTEM RECOVERY PLAN" per Test Director Instructions.

HNF-2317

Rev 0

Page D-19

Type	Document No.	Rev/Mod
CONTINUOUS	OTP-320-001	A-0

5.2 TEST ANNULUS FLOW (Cont.)

- 5.2.3 MONITOR CAM 102-AY continuously during changes to annulus ventilation system flow and vacuum levels, and for 60 minutes after changes have been completed.

NOTE - High CAM levels at startup after an extended shutdown, may be the result of radon buildup in the annulus. Approval process must be started in time to ensure approval for continued operation is "in-hand" at 48 hours.

- 5.2.3.1 IF CAM level exceeds ^{1000 CPM} 550 CPM within 48 hours of startup, THEN OBTAIN approval from Joint Test Review Group for continued operation.
- 5.2.3.2 IF at anytime (except during system start-up) CAM readings indicate ^{1000 CPM} ~~≥ 550 CPM~~, THEN:
- A. STOP testing,
 - B. NOTIFY Test Director,
 - C. GO TO Section 5.4, "SYSTEM RECOVERY PLAN".

HNF-2317

Rev 0

Page D-20

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	OTP-320-001	A-0	1/19/98	19 of 34

5.2 TEST ANNULUS FLOW (Cont.)**5.2.4 IF CAM alarms, THEN:**

5.2.4.1 HPT: COLLECT (replace) filter paper **AND INITIATE** establishment of characteristic decay curve per HNF-PRO-332, "Radon" to determine if Radon is sole source of elevated CAM level.

NOTE - If CAM alarm occurs during annulus startup, DST Shift Manager or Test Director may elect continued testing pending evaluation of filter paper.

5.2.4.2 HPT: CONTACT DST Shift Manager and Radiological Control First Line Manager concerning radon evaluation and CAM setpoint adjustment.

5.2.4.3 IF desired based on HPT evaluation of filter paper, **THEN ADJUST** CAM setpoint per HNF-PRO-332 until Radon (CAM) has stabilized below normal CAM alarm setpoint.

5.2.4.4 IF CAM setpoint is elevated above normal, **THEN** HPT shall evaluate filter paper every four hours per decay curve method in HNF-PRO-332, until setpoint is returned to normal.

5.2.4.5 IF HPT determines CAM alarm is from other than Radon, **THEN** Radiological Control First Line Manager shall **NOTIFY** Test Director, Environmental Compliance Officer and Radiological Control Manager.

5.2.4.6 Test Director: DETERMINE AND DIRECT appropriate response to high CAM reading.

5.2.5 IF annulus vacuum (PI-102-AY) is greater than 4 inWG vacuum, **THEN GO TO** Step 5.2.14

5.2.6 SLOWLY CLOSE annulus test damper T-V-1 until one of the following occurs, **THEN PROCEED** as indicated for the applicable condition:

- **IF** ventilation flow velocity decreases to 700 FPM, **THEN GO TO** Step 5.2.10.
- **IF** annulus vacuum (PI-102-AY) increases by 0.5 inWG from the last recorded value on data sheet, **THEN GO TO** Step 5.2.7.

HNF-2317

Rev 0

Page D-21

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	OTP-320-001	A-0	1/19/98	20 of 34

5.2 TEST ANNULUS FLOW (Cont.)

- 5.2.7 ALLOW system to operate for 30 minutes,
THEN RECORD data per Attachment 4, VENTILATION SYSTEM
DATA SHEET.
- 5.2.8 ALLOW system to operate an additional 30 minutes,
THEN RECORD data per Attachment 4, VENTILATION SYSTEM
DATA SHEET.
- 5.2.9 REPEAT Step 5.2.5 through 5.2.8 as applicable.
- 5.2.10 SLOWLY OPEN flow control damper (K2-MK-6501) until one of the
following occurs,
THEN PROCEED as indicated for the applicable condition:
- IF flow (FI-K2-1-1) is reestablished at 950 to 1000 FPM,
THEN GO TO Step 5.2.5.
 - IF annulus vacuum (PI-102-AY) increases by 0.5 inWG from
the last recorded value,
THEN GO TO Step 5.2.11.
- 5.2.11 ALLOW system to operate for 30 minutes,
THEN RECORD data per Attachment 4, VENTILATION SYSTEM
DATA SHEET.
- 5.2.12 ALLOW system to operate an additional 30 minutes,
THEN RECORD data per Attachment 4, VENTILATION SYSTEM
DATA SHEET.
- 5.2.13 REPEAT Steps 5.2.10 through 5.2.12 as applicable.
- 5.2.14 SLOWLY CLOSE annulus test damper T-V-1 until one of the
following occurs,
THEN PROCEED as indicated for the applicable condition:
- IF ventilation flow velocity decreases to 700 FPM,
THEN GO TO Step 5.2.18.
 - IF annulus vacuum (PI-102-AY) increases by 1 inWG from the
last recorded value on data sheet,
THEN GO TO Step 5.2.15.
 - IF annulus test damper FULLY CLOSES,
THEN GO TO Step 5.2.22.

HNF-2317

Rev 0

Page D-22

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	OTP-320-001	A-0	1/19/98	21 of 34

5.2 TEST ANNULUS FLOW (Cont.)

- 5.2.15 ALLOW system to operate for 30 minutes,
THEN RECORD data per Attachment 4, VENTILATION SYSTEM
DATA SHEET.
- 5.2.16 ALLOW system to operate an additional 30 minutes,
THEN RECORD data per Attachment 4, VENTILATION SYSTEM
DATA SHEET.
- 5.2.17 REPEAT Step 5.2.14 through 5.2.16 as applicable.
- 5.2.18 SLOWLY OPEN flow control damper (K2-MK-6501) until one of the
following occurs,
THEN PROCEED as indicated for the applicable condition:
- IF flow (FI-K2-1-1) is reestablished at 950 to 1000 FPM,
THEN GO TO Step 5.2.14.
 - IF annulus vacuum (PI-102-AY) increases by 1 inWG from the
last recorded value,
THEN GO TO Step 5.2.19.
- 5.2.19 ALLOW system to operate for 30 minutes,
THEN RECORD data per Attachment 4, VENTILATION SYSTEM DATA
SHEET.
- 5.2.20 ALLOW system to operate an additional 30 minutes,
THEN RECORD data per Attachment 4, VENTILATION SYSTEM DATA
SHEET.
- 5.2.21 REPEAT Steps 5.2.18 through 5.2.20 as applicable.
- 5.2.22 SLOWLY OPEN flow control damper (K2-MK-6501) until one of the
following occurs,
THEN PROCEED as indicated for the applicable condition:
- IF flow (FI-K2-1-1) is reestablished at 950 to 1000 FPM,
THEN GO TO Step 5.2.27.
 - IF annulus vacuum (PI-102-AY) increases by 1 inWG from the
last recorded value,
THEN GO TO Step 5.2.23.
- 5.2.23 ALLOW system to operate for 30 minutes,
THEN RECORD data per Attachment 4, VENTILATION SYSTEM
DATA SHEET.
- 5.2.24 ALLOW system to operate an additional 30 minutes,
THEN RECORD data per Attachment 4, VENTILATION SYSTEM
DATA SHEET.
- 5.2.25 REPEAT Steps 5.2.22 through 5.2.24 as applicable.

Type	Document No.	Rev/Mod	Rel'd
CONTINUOUS	OTP-320-001	A-0	

5.2 TEST ANNULUS FLOW (Cont.)

- 5.2.26 ALLOW system to operate for 30 minutes,
THEN RECORD data per Attachment 4, OTP-320-001, VENTILATION
SYSTEM DATA SHEET, and Attachment 5, TEMPERATURE DATA SHEET
every three hours.
- 5.2.27 ALLOW system to operate an additional 30 minutes,
THEN RECORD data per Attachment 4, OTP-320-001, VENTILATION
SYSTEM DATA SHEET, and Attachment 5, TEMPERATURE DATA SHEET
every three hours.
- NOTE - 240 hr time period in step 5.2.28 may be modified (up or down)
as deemed necessary by DST Engineering or Test Director.
- 5.2.28 ALLOW system to operate for 240 hours (10 days) AND RECORD data
per Attachment 4, OTP-320-001, VENTILATION SYSTEM DATA SHEET,
and Attachment 5, TEMPERATURE DATA SHEET every three hours.
- 5.2.29 CLOSE damper (MK-6302) until one of the following occurs,
THEN PROCEED as indicated for the applicable condition:
- IF flow velocity (FI-K2-1-1) decreases to 700 FPM,
THEN GO TO Step 5.2.30.
 - IF annulus vacuum (PI-102-AY) increases by 1 inWG from the
last recorded value,
THEN GO TO Step 5.2.33.
 - IF pressure control damper (MK-6302) is FULLY CLOSED,
THEN GO TO Step 5.2.35.
- 5.2.30 OPEN damper K2-MK-6501 until one of the following occurs,
THEN PROCEED as indicated for the applicable condition:
- IF flow (FI-K2-1-1) is reestablished at 950 to 1000 FPM,
THEN REPEAT Step 5.2.29.
 - IF annulus vacuum (PI-102-AY) increases by 1 inWG from the
last recorded value,
THEN GO TO Step 5.2.31.
 - IF flow control damper (K2-MK-6501) is FULLY OPEN,
THEN GO TO Step 5.2.35.

HNF-2317
Rev 0
Page D-24

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	OTP-320-001	A-0	1/19/98	23 of 34

5.2 TEST ANNULUS FLOW (Cont.)

- 5.2.31 ALLOW system to operate for 30 minutes,
THEN RECORD data per Attachment 4, VENTILATION SYSTEM
DATA SHEET.
- 5.2.32 ALLOW system to operate an additional 30 minutes,
THEN RECORD data per Attachment 4, VENTILATION SYSTEM
DATA SHEET, AND REPEAT Step 5.2.30.
- 5.2.33 ALLOW system to operate for 30 minutes,
THEN RECORD data per Attachment 4, VENTILATION SYSTEM
DATA SHEET.
- 5.2.34 ALLOW system to operate an additional 30 minutes,
THEN RECORD data per Attachment 4, VENTILATION SYSTEM
DATA SHEET, AND GO TO Step 5.2.29.
- 5.2.35 ALLOW system to operate for 30 minutes,
THEN RECORD data per Attachment 4, VENTILATION SYSTEM
DATA SHEET.
- 5.2.36 ALLOW system to operate an additional 30 minutes,
THEN:
- 5.2.36.1 RECORD data per Attachment 4, VENTILATION SYSTEM
DATA SHEET.
- 5.2.36.2 RECORD position of dampers K2-MK-6501 & MK-6302 on
Attachment 1.

HNF-2317

Rev 0

Page D-25

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	OTP-320-001	A-0	1/19/98	24 of 34

5.3 RESTORATION

- 5.3.1 ENSURE K2-MK-6501 is FULL CLOSED.
- 5.3.2 ENSURE MK-6302 is FULL OPEN.
- 5.3.3 ENSURE annulus test damper T-V-1 is FULL CLOSED.
- 5.3.4 SHUT down TK-241-AY-102 Annulus Ventilation system per TO-060-121.
- 5.3.5 ENSURE MK-6302 is FULL CLOSED.
- 5.3.6 QC: VERIFY all data sheets are complete and initialed.

QC SIGNATURE/DATE: See Rev A-3 for Sig. 1

- 5.3.7 FORWARD completed test package including all data sheets and other attachments to Test Engineer and DST Shift Manager for review.

5.4 SYSTEM RECOVERY PLAN

- 5.4.1 IF CAM has alarmed,
THEN respond per ARP-211-00001, "RESPOND TO PANEL 3 ALARMS AT 271-A CONTROL BUILDING"
- 5.4.2 OPEN annulus test damper T-V-1.
- 5.4.3 ENSURE K2-MK-6301 and MK-6302 are OPEN.
- 5.4.4 POSITION K2-MK-6501 so flow velocity is between 900-1100 FPM.
- 5.4.5 OPERATE annulus ventilation system for 150 minutes (2-1/2 hrs).
- 5.4.6 GO TO Section 5.3, RESTORATION.

HNF-2317

Rev 0

Page D-26

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	OTP-320-001	A-0	1/19/98	25 of 34

ATTACHMENT 1, OTP-320-001 TEST LOG

OTP-320-001		Page: <u>1</u> of <u>5</u>
TIME/DATE	DESCRIPTION	
0820 1/19/98	Completed gas sub for OTP-320-001 R30-00124	
0845 1/19/98	2nd gas leak handle pan	
0850 1/19/98	VENTILATION SYSTEM STARTED SIMON DESIGN & FAN CONTROL DANGER	
—	WORKING OK	
0852	THE FOLLOWING THERMOCOUPLES ARE OUT OF SEQUENCE 68, 72, 13, 42, 44, 71	
—	+ 54 CONTINUOUS TESTING	
0950	ADJUSTED VACUUM TO -3.5"	
1005	ADJUSTED VACUUM TO -4"	
1020	ADJUSTED VACUUM TO -4.5"	
1030	ADJUSTED VACUUM TO -5.25"	
1039	ADJUSTED VACUUM TO -6.5"	
1039	CAM INCREASED TO 450 CPM WAITING TO SEE	
—	WHERE IT GOES	
1050	REQUESTED SHIFT SEND OPERATIONS TO OTHERS AVAILABLE	
—	TO SEE IF THEY EXPERIENCED SIMILAR TRENDS	
1650	SHIFT OFFICE REPORTS NO INCREASE ON OTHER CAMS	
—	102-AT CAM AT 400 CPM ADJUSTING VACUUM	
1710	ADJUSTED VACUUM TO 7.5" HAD TO ADJUST FLOW	
—	NEXT VACUUM ADJUSTMENT WILL BE WITH K2-MK-6501	
—	Step 5.2-18	
1810	ADJUSTED VACUUM TO -8.5" BY ADJUSTING MK-6501	
1840	CAM IS READING 550 CPM, SUSPECT RADAR	
—	COMMENCING SYSTEM RECOVERY SECTION 5.4	
1845	T-V-1 IS FULLY OPEN, FLOW IS ADJUSTED TO 1050	

HNF-2317

Rev 0

Page D-27

Type	Document No.	Issue Date	Page
CONTINUOUS	OTP-320-001	A-0	1/19/98
			26 of 34

ATTACHMENT 1, OTP-320-001 TEST LOG

OTP-320-001		Page: <u>2</u> of <u>3</u>
TIME/DATE	DESCRIPTION	
1845/1/21/98	System will now operate for 2.5 hours.	
2115/1/21/98	Obtained JTRG Approval to increase CAM limit to 1000 CPM. Will slowly increase Vacuum back to -8.5" and Resume test.	
2255/1/21/98	Vacuum restored to -8.5", flow is at 700 fpm. CAM is reading 30 cpm. Test is reinitiated. Will resume taking data.	
2355/1/21/98	102-AP CAM increased to 400 CPM and then slowly decreased to 250 cpm. Adjusted Vacuum to -9.5". Tank pressure increased from -2.0" to -2.1". Watching tank Vacuums closely.	
0055/1/22/98	Adjusted Vacuum to -10.5", flow 825 fpm. CAM is reading 400 cpm.	
0215/1/22/98	Attempted to adjust flow to 950 to 1000 fpm	
0455/02/25	Unable to achieve flow. MK-6501 is full open, T-V-1 is roughly 95% closed. Even with T-V-1 fully closed, system will be unable to pull the required flow. Test to determine flow is essentially complete. Will continue with step 5.2.26, which starts the 3 hour data taking process. Vacuum is -11.0" flow is 800 fpm and the CAM is reading 400 cpm.	

HNF-2317

Rev 0

Page D-28

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	OTP-320-001	A-0	1/19/98	26 of 34

ATTACHMENT 1, OTP-320-001 TEST LOG

OTP-320-001		Page: <u>2</u> of <u>3</u>
TIME/DATE	DESCRIPTION	
0630 11/1/98	100 AT PRIMARY VACUUM INCREASED TO -3.6" DUE TO PRESSURE	
—	FUEL PULLED TANK ON 100 AT VACUUM AT -2.5" (AM 3000/h)	
1601	SHUT DOWN EXHAUSTIVE THERMIST TO CHANGE	
	THE SENSORS AND RESTART TEST WITH A 3.000/h	
	THERMISTORS OFFER UP INCREASE AT 930 1130 1430	
	TOOK TEMPERATURES AT 1530.
PM 1-22-98		

HNF-2317

Rev 0

Page D-29

OTP-320-001		Page: 1 of 1	
TEST PROCEDURE NO. & SECTION:		TEST NAME:	EXCEPTION TRACKING NUMBER:
OTB-320 001 ATTACH 5		W-360 ANNULUS VENTILATION 5'STAGE CONTINUOUS TEST	001
DESCRIPTION OF PROBLEM:			
THREACOMPISS TE-101-A7-68 -72 -19 -42 -44 -54 -71 N/A OUT OF SERVICE			
ORIGINATOR:		ORG:	IMPACT ON TESTING:
L5 ANDERSON			☐ HOLD FOR RESOLUTION ☒ CONTINUE
DATE: 1/21/98		TEST DIRECTOR:	DATE: 1-21-98
DISPOSITION:			
CONTINUAL TEST. THREACOMPISS NOT BECAUSE OF CONTINUATION OF TEST			
DISPOSITION APPROVED BY:			
Joseph M. Jones (01-23-98) TEST ENGINEER			
DISPOSITION AND RETEST REQUIREMENTS COMPLETED BY:		DISPOSITION ACTIONS COMPLETE VERIFIED BY:	
N/A JMF 01-23-98 DATE:		N/A JMF 01-23-98 DATE:	
OAE CONCURRENCE WITH DISPOSITION (if required):		RETEST COMPLETE VERIFIED BY:	
N/A JMF 01-23-98 DATE:		N/A JMF 01-23-98 DATE:	
TEST EXCEPTION CLOSED:			
TEST ENGINEER:		DATE:	
Joseph M. Jones		01-23-98	
TEST DIRECTOR:		DATE:	
JMF		1-23-98	

HNF-2317
Rev 0
Page D-30

ATTACHMENT 2, OTP-320-001 TEST EXCEPTION REPORT

OTP-320-001		Page: <u>2</u> of <u> </u>	
TEST PROCEDURE NO. & SECTION: <u>OTP-320-001 Sec. 5.2.18</u>		TEST NAME: <u>102-AV Annulus Vent. Test</u>	EXCEPTION TRACKING NUMBER: <u>002</u>
DESCRIPTION OF PROBLEM: <u>Unable to achieve 950-1000 FPM flow. Flow test is essentially complete. Will skip to section 5.2.26 and commence 10 day data collection.</u>			
ORIGINATOR: <u>JE Andrews</u> <u>francher</u>	ORG: <u>Ops</u> DATE: <u>1/22/98</u>	IMPACT ON TESTING: ☐ HOLD FOR RESOLUTION ☒ CONTINUE TEST DIRECTOR: <u>JE Andrews</u> DATE: <u>1/22/98</u>	
DISPOSITION: <u>Maximum operational capacity was reached at this point of the test (TV-1 approx. 95% closed, K2-MK-6501 100% open, FI-K2-1-1 800 FPM, -11.0 in WG). System is allowed to operate at this range even though TV-1 is not fully closed to commence temperature data collection & trending data). Continued operation of the fan at these ranges will facilitate the purging of radon build up in the system. The fan will be re-sheaved to increase operational capacity of the fan.</u>			
DISPOSITION APPROVED BY: <u>Joseph M Jones</u> TEST ENGINEER (01-23-98)			
DISPOSITION AND RETEST REQUIREMENTS COMPLETED BY: <u>Work package 2 E-98-0191 Joseph Jones</u> (sheave replacement) DATE: <u>01-23-98</u>		DISPOSITION ACTIONS COMPLETE VERIFIED BY: <u>Joseph M Jones</u> DATE: <u>02-11-98</u>	
OAE CONCURRENCE WITH DISPOSITION (if required): <u>N/A gmy</u> DATE: <u>02-11-98</u>		RETEST COMPLETE VERIFIED BY: <u>N/A gmy</u> DATE: <u>02-11-98</u>	
TEST EXCEPTION CLOSED:			
TEST ENGINEER: <u>Joseph M Jones</u>		DATE: <u>02-11-98</u>	
TEST DIRECTOR: <u>JE Andrews</u>		DATE: <u>2/11/98</u>	

HNF-2317
Rev 0
Page D-31

ATTACHMENT 3, OTP-320-001 SIGNATURE LOG

All persons involved in procedure performance, data recording, and verification or evaluation of test steps shall complete a log entry.

NAME (PRINT)	SIGNATURE	INITIALS
K J Anderson		KJA
M. C. Wingfield		MW
Timothy A. Pyle		TAP
Jeff. Durr	JPD
DR Jones		DR
TM Fish		TF
Coxey McLeod		Coxey
Stark Le		SL
RG
DOUG GARCIA		DG
KE HAWK		KEH
JE Andrews		JE
TK Manning		TKM
Jones, Joseph	Joseph Jones	jj

HNF-2317

Rev 0

Page D-32

ATTACHMENT 4, VENTILATION SYSTEM DATA SHEET

[illegible]

HNF-2317
Rev 0
Page D-33

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	OTP-320-001	A-0	1/19/98	29 of 34

ATTACHMENT 4, VENTILATION SYSTEM DATA SHEET

[illegible]

(*) Current calibration required

(#) Use thermometer or temperature indicator

ATTACHMENT 5, TEMPERATURE DATA SHEET

SLUDGE TEMPERATURES

THERMOCOUPLE NUMBER (*)	DESCRIPTION (DISTANCE ABOVE TANK BOTTOM)	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	LCO ¹ LIMIT	AS FOUND (°F **)			
					(Enter time at top of each column)			
TE-102-AY-62	SE PROFILE (4 IN.)	2167	143/143	195°F				
TE-102-AY-68(#)	NW PROFILE (4 IN.)	2175	149/149	195°F				
TE-102-AY-71	NE PROFILE (4 IN.)	2200	152/152	195°F				
TE-102-AY-72	SE SLUDGE (4 IN.)	2201	153/153	195°F				
TE-102-AY-73	W SLUDGE (4 IN.)	2202	154/154	195°F				

ENDNOTE:LCO¹: BIO-LCO 3.3.2, Waste Temperature

(*) Known Out Of Service Thermocouples Removed From Data Sheet.

(#) May be out of service.

(**) If any sludge temperatures exceed 190°F, NOTIFY DST Shift Manager.

INSULATING CONCRETE TEMPERATURES

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each column)			
TE-102-AY-1	7'/SE	2100	088/088	N/A				
TE-102-AY-2	7'/SW	2101	089/089	N/A				
TE-102-AY-3	7'/NW	2102	090/090	N/A				
TE-102-AY-4	7'/NE	2103	091/091	N/A				
TE-102-AY-5	21'/SE	2104	092/092	N/A				
TE-102-AY-6	21'/SW	2105	093/093	N/A				
TE-102-AY-7	21'/W	2106	094/094	N/A				
TK-102-AY-9	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A				
TE-102-AY-10	21'/NE	2110	096/096	N/A				
TE-102-AY-11	21'/SE	2111	097/097	N/A				
TE-102-AY-12	36'/SE	2112	098/098	N/A				
TE-102-AY-13	36'/SW	2113	099/099	N/A				
TE-102-AY-14	36'/SW	2115	101/100	N/A				
TE-102-AY-15	36'/SW	2116	102/101	N/A				
TE-102-AY-16	36'/W	2117	103/102	N/A				

HNF-2317

Rev 0

Page D-35

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	OTP-320-001	A-0	1/19/98	31 of 34

INSULATING CONCRETE TEMPERATURES (Cont.)

THERMOCOUPLE NUMBER (*)	RADIUS/ QUADRANT	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each colum			
TE-102-AY-17	36'/NW	2120	104/103	N/A				
TK-102-AY-18	STATUS UNKNOWN, RECORD IF AVAILABLE			N/A				
TE-102-AY-19	36'/NW	2121	105/104	N/A				
TE-102-AY-21	36'/NE	2123	107/106	N/A				
TE-102-AY-22	36'/NE	2124	108/107	N/A				
TE-102-AY-23	36'/E	2125	109/108	N/A				
TE-102-AY-24	36'/SE	2126	110/109	N/A				
TE-102-AY-25	36'/SE	2127	111/110	N/A				

TANK KNUCKLE TEMPERATURE

THERMOCOUPLE NUMBER (*)	DESCRIPTION	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F)			
					(Enter time at top of each colum			
TE-102-AY-26	TANK KNUCKLE W	2130	112/111	N/A				
TE-102-AY-27	TANK KNUCKLE E	2131	113/112	N/A				

AIRLIFT CIRCULATOR TEMPERATURES

THERMOCOUPLE NUMBER (*)	CIRCULATOR NUMBER	CASS ID NUMBER	DORIC/WESTRONICS SCANNER #	N/A	AS FOUND (°F **)			
					TIME	TIME	TIME	TIME
TE-102-AY-42	6	2144	124/123	N/A				
TE-102-AY-44	8	2146	126/125	N/A				
TE-102-AY-50	16	2154	132/131	N/A				
TE-102-AY-54	20	2522	362/135	N/A				
TE-102-AY-59	11	2164	140/140	N/A				

(*) - Known Out Of Service Thermocouples Removed From Data Sheet.

(**) If any airlift circulator exceeds 240°F, NOTIFY DST Shift Manager.

HNF-2317

Rev 0

Page D-36

Type

CONTINUOUS

Document No.

OTP-320-001

Rev/Mod

A-0

Release Date

1/19/98

Page

32 of 34

FIGURE 1 - W-320 ANNULUS VENTILATION OTP TEST LOGIC

TEST PRECAUTIONS:

IF AT ANYTIME DURING TESTING:

1. CAM LEVELS MEET OR EXCEED 550 CPM, THEN NOTIFY TEST DIRECTOR AND PERFORM RECOVERY ACTIONS LISTED IN SECTION 5.4.
2. ANNULUS VACUUM LEVELS INDICATED ON PI-102-AY EXCEED 14 INWC, THEN STOP AND NOTIFY TEST DIRECTOR.
3. PRIMARY TANK VACUUM INCREASES 0.5 IN RELATIVE TO INITIAL RECORDED VALUE, THEN STOP AND NOTIFY TEST DIRECTOR.
4. CAM ALARMS, THEN FOLLOW EXISTING ALARM RESPONSE PROCEDURE.

HNF-2317
Rev 0
Page D-37

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	OTP-320-001	A-0	1/19/98	33 of 34

FIGURE 2 - W-320 ANNULUS VENTILATION SYSTEM SCHEMATIC

HNF-2317
Rev 0
Page D-38

Type	Document No.	Rev/Mod	Release Date	Page
CONTINUOUS	OTP-320-001	A-0	1/19/98	34 of 34

DOCUMENT ACCEPTANCE REVIEW FORM

Page 1 of 1

TF-98-054

Procedure Change Number

TF-97-1005

USQ Screening No.

N/A

Approval Designator

DTP-32-001

Document No.

A/I

Rev./Mod.

Prepared By

J. SHAFER

Name

☐ Plant Operating Procedure☐ Alarm Response Procedure☐ Operator Round Sheet☐ Facility Sampling Schedule☐ Criticality Specifications☐ Other Type Document☐ Maintenance Procedure☐ Operating Specification Document
(Requires Checklist)

Title/Organization

☐ New or Revised - Full Review Required☒ Procedure Change Authorization☐ Administrative Change

D-320 ANNULAR VENTILATION

SYSTEM OPERATIONAL TEST

Document Title

☐ Procedure Changes/Changed Pages/Summary of change AS SHOWN ON ATTACHED CHANGE SUMMARY SHEET

PROCEDURE IS ACCEPTABLE

PROCEDURE REVIEWERS SIGNATURES

As Is With
Changes
Noted☒☐

Jm fm

TM Fm

TFC

1-26-98

(Signature - Certified Operator/User)

(Print Name)

(Title/Org)

(Date)

Ensures that the procedure has been field validated and comments incorporated.

☐☐

N/A

(Signature - QA Engineer)

(Print Name)

(Title/Org)

(Date)

☐☐

N/A

(Signature - Safety Engineer)

(Print Name)

(Title/Org)

(Date)

☒☐

Jm fm

KJ Anderson

OE/DST

1-26-98

(Signature - Shift Manager
or Operations Support Manager)

(Print Name)

(Title/Org)

(Date)

Verifies documentation is complete, including Change Summary Signature Sheet and ensures Radiological review is complete or
marks Radiological Controls as N/A☐☐

N/A

(Signature - Radiological Controls)

(Print Name)

(Title/Org)

(Date)

☒☐

WJ Powell

W.J. POWELL

DA AP/A2

1/26/98

(Signature - Other)

(Print Name)

(Title/Org)

(Date)

☒☐

Jm fm

Jm Jones

Gg SST/DST Egn. 01-26-98

01-26-98

(Signature - Cognizant Engineer)

(Print Name)

(Title/Org)

(Date)

Ensures that the technical aspects of the procedure are correct, and that the procedure has been reviewed per the approval designator.
Enters the USQ Screening No.

PROCEDURE WRITER

HNF-2317

Rev 0

Page D-39

(Signature)

(Title/Org)

(Date)

APPROVAL AUTHORITY

(Signature)

KJ Anderson

(Print Name)

OE/DST

(Title/Org)

1-26-98

(Date)

CHANGE SUMMARY AND SIGNATURE SHEET

Page 1 of 1

Procedure Number, Rev/Mod Number

0-320-001, A/1

Procedure Title

W-320 Annexes
Ventilation System Operational Test

Order (if applicable)

ETP-98-036

Effective Date of Change

1-26-98

Affected

Page Step

2-5.2.1

Summary of Change

Added substep
5.2.1.1 & reworded
5.2.1 to allow use/adjustment
of radial inlet damper to
stabilize flow

Reason for Change

COG Engineer
request

(You may attach additional pages if necessary to cover all procedure changes.)

I have read and understand the instruction contained in the Procedure/PCA/change listed above as required to maintain training/certification currency.

SIGNATURE	DATE	SIGNATURE	DATE

(If room for additional signatures is needed, they may be placed on the back.)

HNF-2317

Rev 0

Page D-40

DOCUMENT ACCEPTANCE REVIEW FORM

Page 1 of 1

ETF-98-060

TF-97-1005 (Applicable) N/A

Prepared By

Procedure Change Number

USQ Screening No.

Approval Designator

P-320-001

A-2

Name

Document No.

Rev./Mod.

- ☒ Plant Operating Procedure ☐ Alarm Response Procedure
- ☐ Operator Round Sheet ☐ Facility Sampling Schedule
- ☐ Criticality Specifications ☐ Other Type Document
- ☐ Maintenance Procedure ☐ Operating Specification Document
(Requires Checklist)

Cs Eng 551/W-320/DST Eng
Title/Organization

☐ New or Revised - Full Review Required☒ Procedure Change Authorization☐ Administrative Change

W-320 Annulus Ventilation System

Operational Test

Document Title

- ☒ Procedure Changes/Changed Pages/Summary of change Page 19, clarified steps necessary for stabilizing fan (steps 5.2.1.1, 5.2.1.2, and 5.2.1.3)

PROCEDURE REVIEWERS SIGNATURES

MENT IS ACCEPTABLE

As Is With Changes Noted

☒ ☐ Imad H. Pile NPO/DST 1-27-98
(Signature - Certified Operator/USQ) (Print Name) (Title/Org) (Date)
Ensures that the procedure has been field validated and comments incorporated.

☐ ☐ N/A (Print Name) (Title/Org) (Date)
(Signature - QA Engineer)

☐ ☐ N/A (Print Name) (Title/Org) (Date)
(Signature - Safety Engineer)

☒ ☐ KS Anderson OE/DST 1-27-98
(Signature - Shift Manager or Operations Support Manager) (Print Name) (Title/Org) (Date)
Verifies documentation is complete, including Change Summary Signature Sheet and ensures Radiological review is complete or marks Radiological Controls as N/A

☐ ☐ N/A (Print Name) (Title/Org) (Date)
(Signature - Radiological Controls)

☒ ☐ W. T. Foxwell DA AP/AZ 1-27-98
(Signature - Other) (Print Name) (Title/Org) (Date)

☒ ☐ Joseph M. Jones Cs Eng 551/DST Eng 01-27-98
(Signature - Cognizant Engineer) (Print Name) (Title/Org) (Date)
Ensures that the technical aspects of the procedure are correct, and that the procedure has been reviewed per the approval designator. Enters the USQ Screening No.

PROCEDURE WRITER

HNF-2317

Rev 0

Page D-41

(Signature)

(Title/Org)

(Date)

APPROVAL AUTHORITY

(Signature)

(Print Name)

(Title/Org)

(Date)

CHANGE SUMMARY AND SIGNATURE SHEET

Page 1 of 1

Procedure Number, Rev/Mod Number

Procedure Title

20-001, REV A-2

W-320 ANNULUS VENTILATION SYSTEM OPERATIONAL

ver (if applicable)

Effective Date of Change

Affected
Page Step

Summary of Change

Reason for Change

CE 19,
EP 5.2.1.1

ADD: " MK-6302, AND K2-MK-6501"

LESSONS LEARNED ON STABILIZING FAN FROM PREVIOUS ATTEMPTS.

CE 19,
EP 5.2.1.2

DELETE: "AFTER 45 MIN." AND "WITH RADIAL INLET DAMPER"

LESSONS LEARNED ON STABILIZING FAN FROM PREVIOUS ATTEMPTS.

CE 19,
EP 5.2.1.3

ADD: "REPEAT STEPS 5.2.1.1 AND 5.2.1.2 AT DESCRETION OF TEST ENGINEER. THEN PROCEED.

LESSONS LEARNED ON STABILIZING FAN FROM PREVIOUS ATTEMPTS.

(You may attach additional pages if necessary to cover all procedure changes.)

I have read and understand the instruction contained in the Procedure/PCA/change listed above as required to maintain training/certification currency.

SIGNATURE	DATE	SIGNATURE	DATE

(If room for additional signatures is needed, they may be placed on the back.)

DOCUMENT ACCEPTANCE REVIEW FORM

Page 1 of 1

TF-98-081

TF-97-1005

EQ

Procedure Change Number

USO Screening No.

Approval Designator

Prepared By

Jm Jones

Name

W-320 Cog / DST Engr.

Title/Organization

☐ New or Revised - Full Review Required☒ Procedure Change Authorization☐ Administrative Change

0TP-320-001

A/B

Document No.

Rev./Mod.

- ☒ Plant Operating Procedure ☐ Alarm Response Procedure
- ☐ Operator Round Sheet ☐ Facility Sampling Schedule
- ☐ Criticality Specifications ☐ Other Type Document
- ☐ Maintenance Procedure ☐ Operating Specification Document
(Requires Checklist)

W-320 ANNULUS VENTILATION SYSTEM

OPERATIONAL TEST

Document Title

☐ Procedure Changes/Changed Pages/Summary of change AS SHOWN IN ATTACHED CHANGE

SUMMARY AND SIGNATURE SHEET

PROCEDURE REVIEWERS SIGNATURES

DOCUMENT IS ACCEPTABLE

As Is With
Changes
Noted

☒	☐	<u>Don R Jones</u> (Signature - Certified Operator/User) Ensures that the procedure has been field validated and comments incorporated.	<u>DR Jones</u> (Print Name)	<u>LNCO</u> (Title/Org)	<u>2/9/98</u> (Date)
☒	☐	<u>W. Adams</u> (Signature - QA Engineer)	<u>W. Adams</u> (Print Name)	<u>DRE/DST</u> (Title/Org)	<u>2/9/98</u> (Date)
☐	☐	<u>N/A gmo</u> (Signature - Safety Engineer)	 (Print Name)	 (Title/Org)	 (Date)
☒	☐	<u>JE Andrews</u> (Signature - Shift Manager or Operations Support Manager) Verifies documentation is complete, including Change Summary Signature Sheet and ensures Radiological review is complete or marks Radiological Controls as N/A	<u>JE Andrews</u> (Print Name)	<u>SM/DST</u> (Title/Org)	<u>2/10/98</u> (Date)
☐	☐	<u>N/A fca</u> (Signature - Radiological Controls)	 (Print Name)	 (Title/Org)	 (Date)
☒	☐	<u>W. Powell</u> (Signature - Other)	<u>W. J. POWELL</u> (Print Name)	<u>DA/PP/AZ</u> (Title/Org)	<u>2/10/98</u> (Date)
☒	☐	<u>Don R Jones</u> (Signature - Cognizant Engineer) Ensures that the technical aspects of the procedure are correct, and that the procedure has been reviewed per the approval designator.	<u>Jm Jones</u> (Print Name)	 (Title/Org)	 (Date)

PROCEDURE WRITER

HNF-2317

Rev 0

Page D-43

Title/Org

(Date)

(Signature)

APPROVAL AUTHORITY

(Signature)

JE Andrews
(Print Name)SM/DST
(Title/Org)2/10/98
(Date)

CHANGE SUMMARY AND SIGNATURE SHEET

Page 1 of 1

Figure Number, Rev/Mod Number

-320-001, REV A-3

Procedure Title

W-320 ANNULUS VENTILATION SYSTEM
OPERATIONAL TEST PROCEDURE

PCA Number (if applicable)

ETC 98-081

Effective Date of Change

2-10-92

Affected Page Step	Summary of Change	Reason for Change
Page 5, Step 2.2.7	DELETE: "Verifies prerequisites complete prior to start of test."	Test Director/Engineer Request
Page 7, Step 2.4.4.	ADD: "except during test steps 5.2.31 through 5.2.39."	Omission
Page 24, Step 5.2.31	DELETE: "IF flow velocity (F1-K2-1-1) decreases to 700 FPM, THEN GO TO Step 5.2.32."	Flow is expected to decrease below 700 FPM.
Page 24, Steps 5.2.32 through 5.2.34	Delete these steps.	This logic branch is unnecessary when flow is allowed to decrease below 700 FPM.
Page 24, Step 5.2.37	DELETE existing instruction and provide for operation of K2-MK-6501 during testing to determine system maximum vacuum.	Logic omission.
Page 25, Step(s) 5.2.38, 5.2.39, 5.2.40	Insert new data acquisition step and renumber existing step to become 5.2.40.	Reflects revision to test logic required for positioning of K2-MK-6501.

ie 17
ac Hold point symbol inadvertently
left on page. Requirement was
previously deleted. Thus, delete
(editorially) ac Hold point
symbol.

see to the left.
←

(You may attach additional pages if necessary to cover all procedure changes.)

I have read and understand the instruction contained in the Procedure/PCA/change listed above as required to maintain training/certification currency.

SIGNATURE	DATE	SIGNATURE	DATE

HNF-2317
Rev 0
Page D-44

(If room for addit

ced on the back.)

APPENDIX E

TEST DATA PLOTS

FIGURE 1
SW QUADRANT TE DATA PLOT

FIGURE 2
INNER DIAMETER CONCRETE TE DATA

FIGURE 3
MID-DIA CONCRETE TE DATA

FIGURE 4
OUTER DIA CONCRETE TE DATA

FIGURE 5
SLUDGE TE DATA

FIGURE 6
102-AY ANNULUS VENT SYSTEM DATA

FIGURE 7
CAM LEVEL DATA

241-AY-102

THERMOCOUPLE LOCATION MAP

LEGEND

INSULATING CONCRETE TE'S
AIRLIFT CIRCULATOR TE'S (3" FROM TANK BOTTOM)
TREE TE'S (4" FROM TANK BOTTOM)
CIRCLED TE'S ARE OUT OF SERVICE

APPENDIX F

CALCULATED SYSTEM CURVES VS TEST DATA

Annulus Vacuum vs Annulus Flow Rate

Vacuum at Portable Exhauster Skid Intake
vs Flow Rate (AY-102 Annulus)

Vacuum vs Flow Rate

Annulus Vacuum vs Slot Flow Rate (Calculated, Dry Air) for Different Temperatures

IN.HG

DETAIL: Annulus Vacuum vs Slot Flow Rate (Calculated, Dry Air)

APPENDIX G

INLET DUCT PITOT TRAVERSE DATA

DATA FROM PITOT TRAVERSE OF 102-AY INLET DUCT							
DATE: 2/5/98 (MORNING)							
DUCT SIZE: 12"							
DUCT AREA: 0.785 SQ FT							
ERROR IS FROM WHC-SD-WM-ER-383, REV 0, = ± 0.0255 INWG							
READING	MEASURED	ERROR (+)	ERROR (-)	HIGH VELOCITY FPM	LOW VELOCITY FPM	HIGH FLOW CFM	LOW FLOW CFM
1	0.087	0.1125	0.0615	1343.3178	993.2077	1054.5045	779.668045
2	0.094	0.1195	0.0685	1384.4793	1048.2088	1086.81627	822.843917
3	0.096	0.1215	0.0705	1396.0168	1063.401	1095.87323	834.769813
4	0.094	0.1195	0.0685	1384.4793	1048.2088	1086.81627	822.843917
5	0.096	0.1215	0.0705	1396.0168	1063.401	1095.87323	834.769813
6	0.097	0.1225	0.0715	1401.75	1070.9163	1100.37375	840.66932
7	0.096	0.1215	0.0705	1396.0168	1063.401	1095.87323	834.769813
8	0.096	0.1215	0.0705	1396.0168	1063.401	1095.87323	834.769813
9	0.096	0.1215	0.0705	1396.0168	1063.401	1095.87323	834.769813
10	0.094	0.1195	0.0685	1384.4793	1048.2088	1086.81627	822.843917
11	0.086	0.1115	0.0605	1337.3342	985.09975	1049.80735	773.303302
12	0.066	0.0915	0.0405	1211.4711	805.9907	951.004833	632.702701
AVERAGE:				1368.9496	1026.4038	1074.62545	805.727015