53 START Station #1
MAR 31 1993

0036069

ENGINEERING DATA TRANSMITTAL

Page 1 of 1

1. EDT 158001

2. To: (Receiving Organization) PUREX Regulatory Compliance	3. From: (Originating Organization) PUREX Process Technology Support	4. Related EDT No.: NA
5. Proj./Prog./Dept./Div.: KE82B//17520/17000	6. Cog. Engr.: H. R. Risenmay 2017521	7. Purchase Order No.: NA
8. Originator Remarks: N/A Key words: Dangerous, Waste, Tanks, Leak Integrity 3-31-93		9. Equip./Component No.: NA
		10. System/Bldg./Facility: PUREX
11. Receiver Remarks:		12. Major Assm. Dwg. No.: NA
		13. Permit/Permit Application No.: NA
		14. Required Response Date: N/A

MAY 1994 RECEIVED EDMC

15. DATA TRANSMITTED

(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	(F) Impact Level	(G) Reason for Transmittal	(H) Originator Disposition	(I) Receiver Disposition
1	WHC-SD-CP-TRP-055	—	0	Leak Test Report for PUREX Dangerous Waste Tanks	~~3~~ 4 3-31-93 per telecon L. Clay	2	1	1

16. KEY

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

17. SIGNATURE/DISTRIBUTION (See Impact Level for required signatures)

(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M) MSIN	(G) Reason	(H) Disp.
1	1	Cog.Eng. D.W. Reberger	[signature]	3/25/93	S6-18						
1	1	Cog. Mgr. D.J. Washenfelder	[signature]	3/24/93							
		QA									
		Safety									
		Env.									
2	1	INFORMATION RELEASE ADMIN			R1-08						

18.	19.	20.	21. DOE APPROVAL (if required)
[signature] 3/24/93 Signature of EDT Originator / Date	[signature] 3/25/93 Authorized Representative Date for Receiving Organization	[signature] 3/24/93 Cognizant/Project Engineer's Manager / Date	Ltr. No. [] Approved [] Approved w/comments [] Disapproved w/comments

BD-7400-172-2 (07/89) (EF) GEF097

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BD-7400-172-1 (02/89)

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INFORMATION RELEASE REQUEST

References: WHC-CM-3-4

COMPLETE FOR ALL TYPES OF RELEASE

Purpose

- [ ] Speech or Presentation (Check only one suffix)
  - [ ] Full Paper
  - [ ] Summary
  - [ ] Abstract
  - [ ] Visual Aid
- [ ] Speakers Bureau
- [ ] Poster Session
- [ ] Videotape
- [ ] Reference
- [X] Technical Report
- [ ] Thesis or Dissertation
- [ ] Manual
- [ ] Brochure/Flier
- [ ] Software/Database
- [ ] Controlled Database
- [ ] Other

New ID Number: WHC-SD-CP-TRP-055, Rev. 0

Existing ID Number (include revision, volume, etc.)

If previously cleared, list ID number

Date Release Required

Title: WHC-SD-CP-TRP-055, Rev. 0, "Leak Test Report for PUREX Dangerous Waste Tanks"

Unclassified Category: UC-

Impact Level: 4

COMPLETE FOR SPEECH OR PRESENTATION

Title of Journal

Group or Society Sponsoring

Date(s) of Conference or Meeting

City/State

Will proceedings be published? [ ] Yes [ ] No

Will material be handed out? [ ] Yes [ ] No

Title of Conference or Meeting

CHECKLIST FOR SIGNATORIES

Review Required per WHC-CM-3-4	Yes	No	Reviewer Name (printed)	Signature	Date
Classification/Unclassified Controlled Nuclear Information	[ ]	[X]			
Patent - General Counsel	[X]	[ ]	SW BERGIN		9/6/92
Legal - General Counsel	[X]	[ ]	BDWilliamson	BDWilliamson	9/6/92
Applied Technology/Export Controlled Information or International Program	[ ]	[X]			
WHC Program	[X]	[ ]	EV WEISS		4-6-92
Communications	[X]	[X]			
DOE-RL Program	[X]	[X]	D A Brauer		4/15/92
Publication Services	[X]	[X]	S.A. Forney	Susan A. Forney	6/23/92
Other Program	[ ]	[X]			
References Available to Intended Audience	[X]	[ ]	H. Rees Risenmay		3/26/92
Transmit to DOE-HQ/Office of Scientific and Technical Information	[ ]	[X]			

Information conforms to all applicable requirements. The above information is certified to be correct.

Author/Requestor (Printed/Signature) Date

H. R. Risenmay H. Rees Risenmay 3/25/92

Responsible Manager (Printed/Signature) Date

D. G. Harlow D G Harlow 3/25/92

Intended Audience

[ ] Internal [ ] Sponsor [X] External

INFORMATION RELEASE ADMINISTRATION APPROVAL STAMP

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APPROVED FOR RELEASE OFFICIAL DOCUMENT KMB Date 6/24/92

Date Received 3/26/92 KMS

BD-7600-062 (4/90) (EF) WEF074
Information Release Request

Part 1

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SUPPORTING DOCUMENT

1. Total Pages 101

2. Title	3. Number	4. Rev No.
LEAK TEST REPORT FOR PUREX DANGEROUS WASTE TANKS	WHC-SD-CP-TRP-055	0

5. Key Words	6. Author
DANGEROUS, WASTE, TANKS, LEAK, INTEGRITY	Name: H. R. RISENMAY H. Rees Risenmay 3/24/92 Signature Organization/Charge Code 17521

7. Abstract

THE INTEGRITY ASSESSMENT OF TANKS TK-F18, TK-U3, AND TK-U4 SHOWED THAT NONE OF THE TANKS LEAKED.

APPROVED FOR PUBLIC RELEASE KMB 6/4/92

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10. RELEASE STAMP

OFFICIAL RELEASE BY WHC
DATE MAR 31 1993
Station #1

9. Impact Level ~~3~~ 4 DHC 3-29-93

per Tele Con L. Clay

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LEAK TEST REPORT
FOR PUREX DANGEROUS WASTE TANKS

INCLUDING:
TK-F18
TK-U3
TK-U4

Prepared by
H. Rees Risenmay
Senior Engineer
PUREX Process Technology Support
PUREX Process Engineering

ABSTRACT:

The integrity assessments of the three tanks included in this report showed that none of the tanks leaked.

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LEAK TEST REPORT FOR THE PUREX DANGEROUS WASTE TANKS

Prepared by:

H. Rees Risenmay — 7/16/92
H. Rees Risenmay, Senior Engineer — Date
PUREX Process Technology Support

Reviewed by:

Dan Reberger — 7/13/92
D. W. Reberger Cognizant Engineer — Date
PUREX Process Technology Support

L. E. Clay — 7/13/92
L. E. Clay, Principal Engineer — Date
PUREX Regulatory Compliance

Approved for WHC:

DJ Washenfelder — 7/13/92
D. J. Washenfelder, Manager — Date
PUREX Process Technology Support

LJC 7/14/92
G. J. LeBaron — 7/20/92
G. J. LeBaron, Manager — Date
PUREX Regulatory Compliance

Ronald W. Bailey — 7/20/92
R. W. Bailey, Manager — Date
PUREX Operations

C. A. Sams — 7/21/92
C. A. Sams, Manager — Date
PUREX Quality Assurance

Independent Review:

Navroze D. Amaria — 9/30/92
Navroze D. Amaria, P. E. — Date
Independent, Qualified Registered Professional Engineer

Prepared for:
Westinghouse Hanford Company
U. S. DEPARTMENT OF ENERGY
Richland, Washington

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TABLE OF CONTENTS

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1.0 INTRODUCTION

The PUREX Plant utilizes a number of tank systems that contain dangerous waste constituents as defined by the Washington State Department of Ecology's (WDOE) Dangerous Waste Regulations, Washington Administrative Code (WAC) 173-303-040(18). Chapter 173-303-640(2) of the WAC requires written integrity assessments for such tank systems. The PUREX Dangerous Waste Tank Systems Integrity Assessment Plan (WHC-SD-CP-WP-010, Rev.1) (Reference 1) identifies the tasks which will be performed during the integrity assessment. One of the required tasks is a leak test of the dangerous waste tank systems (tanks and ancillary equipment such as piping, jumpers, valves, etc.) as outlined in the PUREX Dangerous Waste Tank Systems Leak Test Plan (WHC-SD-CP-TP-057), dated June 13, 1990 (Reference 2). This document reports the results of the leak tests of the tanks but not of the ancillary equipment. The results of the piping leak tests are reported in the Leak Test Report for PUREX Dangerous Waste Piping (WHC-SD-WP-020) (Reference 4).

2.0 SCOPE

When the Leak Test Plan was written, the PUREX Plant contained five (5) dangerous waste tank systems with 13 dangerous waste tanks. The PUREX Plant is being placed in Standby pending determination of the final plant status. During Standby, only two dangerous waste tank systems (TK-F18 and TK-U3/TK-U4) will remain in service. Although leak tests were conducted on all 13 original dangerous waste tanks, this report will document the results of only the leak tests conducted on the three tanks included in the two dangerous waste tank systems remaining in service during Standby.

3.0 DESCRIPTION OF LEAK TEST PROCEDURE

A major factor in determining the leak testing method to be used is the location of the dangerous waste tanks. TK-F18 is located in F Cell in the PUREX Plant canyon. This tank is inaccessible due to the high radiation field (>500 rad/hour). Therefore all leak testing was performed remotely. TK-U3 and TK-U4 are located in U Cell. Although personnel entries can be made in U Cell, ALARA (As Low As Reasonably Achievable) considerations dictate that these entries be minimized. Remote leak testing was preferred for TK-U3 and TK-U4. Subsequent testing of the ancillary equipment, however required manned entry into the cell.

The leak testing method used for the PUREX Plant dangerous waste tanks is consistent with the American Society of Mechanical Engineers (ASME) Section XI, Article IWD-5000, Paragraph 5223(b):

> "In the case of atmospheric storage tanks, the hydrostatic head, developed with the tank filled to its design capacity, shall be acceptable as the test pressure. For 0-15 psi storage tanks, the test pressure shall be 1.1 P_G, Design Pressure of vapor or gas space above liquid level for which overpressure protection is provided by relief valve."

The tank water level during the leak test was set within 5 cm of the reference tube at the top of the tank to insure that the ASME standard noted above is complied with.

The PUREX Plant uses a highly accurate liquid level measuring system for Special Nuclear Material (SNM) accountability. This system is based on an electromanometer manufactured by RUSKA Corporation and the system is hereafter identified by the name RUSKA. Refer to Appendix H for RUSKA schematics and a photograph of the RUSKA in use.

The Statistics Team of the Process Analytical Laboratory examined past calibration data and determined that the RUSKA system could reliably observe level changes of greater than 0.46 cm (0.18 in.) of water. See internal letter 12711-90-038 (Reference 3) for details. This corresponds to 32.9 l (8.7 gallons) in a 18.9 m^3 (5000 gallon) canyon tank of 3 m (10 ft. diameter). It was determined from the data that a minimum time for observation of the level in the waste tanks using a 1.5 safety factor would therefore be 14 hours to be able to detect a leak that was leaking at a rate of 3.8 liters (1 gallon) per hour. This was, therefore, established as the test criteria that would be used to determine if the tank was leaking or not.

Where possible, the leak tests were performed in conjunction with the hexennial calibrations that are performed on the SNM accountability tanks where those tanks are associated with the dangerous waste systems, which included TK-F18. Tanks TK-U3 and TK-U4 are not SNM accountability tanks. The following describes the evaluation of the SNM tanks with the difference in procedure for the non-SNM tanks being the elimination of the calibration run where individual additions of 94.6 l (25 gallons) are added to the tanks from a certified prover. The non-SNM tanks were just filled with water, usually water that was previously used to calibrate one of the SNM tanks.

3.1 FLUSHING THE TANK

The diptubes were steamed to remove any accumulated salts and general crud that might be present and then the tank was filled with water, heated, and agitated to dissolve any solids present. The flush water was jetted out and the resulting heel was flushed with two separate 500 gallon additions with agitation to remove as many salts and solids as possible. Samples from the last flush were checked to determine if the tank was properly flushed.

3.2 ISOLATING THE TANK

The tank was then isolated by closing valves on any piping that was connected to the tank. The closed valves were leak checked by means of a stethoscope to determine if the isolation was effective. This method can find leaks from a header with high pressure upstream of the valve but is not always effective for headers that are not pressurized and only have minimal head pressure from the AMU storage tanks. In the case of tank TK-F18 several canyon jumpers were removed to ensure isolation.

3.3 SET UP OF CALIBRATION EQUIPMENT

The calibration computer cabinet, printer, prover stand, prover scale and prover were then set up in the P&O gallery in a convenient location with access to the instrumentation for the test tank.

The calibration ports (access ports used by the instrument technicians when calibrating the associated instrument) for the specific gravity and weight factor transmitters were used for the source of the pressure for the RUSKA pressure transducers connected to the calibration computer.

The wiring leads from the in-tank thermohm were disconnected from the normal control room temperature transmitter and were reconnected to a temperature transmitter that is part of the calibration equipment. The calibration equipment includes appropriate temperature transmitters for each type of thermohm used in the PUREX plant.

The control wiring to the tank agitator was reconnected to the calibration computer for control as determined by the software.

The prover fill valve was connected to a source of demineralized water and the prover drain valve was connected to a convenient pipeline leading to the test tank.

3.4 CALIBRATION OF TANK

After checks of the computer control of the associated equipment and preweting of the prover and lines leading to the tank, the tank is emptied and the jet re-isolated. The calibration is then started with the computer filling, weighing, and draining the prover to the test tank. Between each addition to the tank the calibration equipment takes temperature readings of the prover and tank and RUSKA pressure readings. This process is repeated until the tank overflows with the data collected on both a hard copy printing and a floppy disk. The printing and the disk are delivered to the statistician for evaluation and calculation of the new tank calibration equations.

3.5 INTEGRITY ASSESSMENT OF TANK

Following the calibration, less than 5 cm (2 in.) of water was jetted out and a new computer software program loaded that periodically took new RUSKA pressure readings and stored the readings on a hardcopy printing and a floppy disk. The evaluation period for tank TK-F18 was 19 hours, that for TK-U3 was 65 hours and that for TK-U4 was 89 hours. In each case the readings were taken at 60 minute intervals.

3.6 RESTORATION OF TANK

After the assessment of the tank was completed the calibration equipment was disconnected and all instrumentation restored to original configuration. All Dangerous waste tanks were returned to normal service following the conclusion of each test procedure. The water

added was either used to flush the next tank or to leak test a non-SNM tank.

4.0 RESULTS OF TESTS

The results of the leak tests are reported as compared to the test criteria which follows:

TEST CRITERIA

Leak detection Method: Bubble tube with RUSKA electomanometer.

Tank Water Level: Below reference tube < 5cm (2 in.)

Minimum water hold time: 14 hours.

Data required: Test times, water temperature, water level, variance of each data value.

Data interval: Minimum of 8 printed records evenly spaced over test.

Maximum water level fluctuation: 0.46 cm.

Instrument sensitivity (maximum variance): 100 (1.0 cm^2 X 100)

MANDATORY QUALITY CONTROL HOLD POINTS

Tank isolation and leak checks completed.

Pre-calibration and/or assessments steps completed.

Specified water level set for integrity assessment.

TK-F18

The test criteria of no more than 0.46 cm water change in depth in 14 hours was easily maintained and the total observation period of 19 hours also met the test criteria.

TK-U3

Tank TK-U3 met the 0.46 cm water/14 hours test criteria.

TK-U4

Tank TK-U4 met the 0.46 cm water/14 hours test criteria.

WASTE TANK LEAK CHECK DATA (Cm H_2O)

TANK	AVERAGE LEVEL	MAXIMUM	MINIMUM	DEVIATION
TK-F18	268.47896	268.5364	268.4510	0.0854/19 HOURS
TK-U3	440.9903	441.2644	440.7995	0.4649/65 HOURS
TK-U4	444.5907	444.6593	444.5089	0.1504/89 HOURS

5.0 CONCLUSIONS AND RECOMMENDATIONS

The three tanks tested (TK-F18, TK-U3, TK-U4) all passed the test criteria and are determined to not leak. Following successful assessments of the ancillary equipment, continued use of the PUREX dangerous waste systems as now used and configured is recommended.

6.0 REFERENCES

1. L. E. Clay, PUREX DANGEROUS WASTE TANK SYSTEMS INTEGRITY ASSESSMENT PLAN, WHC-SD-CP-WP-010, Rev. 1, July 31, 1991.

2. D. C. Pfluger, PUREX DANGEROUS WASTE TANK SYSTEMS LEAK TEST PLAN, WHC-SD-CP-TP-057, Westinghouse Hanford Company (May 1990).

3. T. L. Welsh, Internal Letter 12711-90-038, RUSKA PRESSURE TRANSDUCER PERFORMANCE, April 4, 1990.

4. K. J. Young, LEAK TEST REPORT FOR PUREX DANGEROUS WASTE PIPING, WHC-SD-CP-WP-020, Westinghouse Hanford Company (August 1992).

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7.0 APPENDICES

APPENDIX A
TK-F18 WORK PROCEDURE

DOCUMENT ACCEPTANCE REVIEW FORM

Page 1 of 30

DOCUMENT

Work Procedure — Type
WP-P-90-11 — No.
3 — Impact Level
A-0 — Rev./Mod.
TK-F18 Calibration — Title

Prepared By

H. R. Risenmay — Name
PPE — Title/Organization

- [X] New or Revised Document – Full Review Required
- [ ] Modification – Changed Pages _____

- [ ] Full Review Required
- [ ] Review Limited to Change Pages/No Preliminary Review Required
- [ ] Administrative Change –
- [ ] PCA – Approved Changes Only –

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☐	☐	☐			

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ACCEPTANCE REVIEW CHAIRMAN

- [X] All objections resolved
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R K Coon (Signature) — Manager Purex Process Ops (Title/Org.) — 5/2/90 (Date)

WORK PROCEDURE

TK-F18 CALIBRATION WP-P-90-11 PAGE 1 OF 25

I. SYSTEM DESCRIPTION

This work plan provides instructions for performing dip tube and tank flushes for TK-F18 in preparation for tank calibration. Before performing the tank calibration TK-F18 should be flushed with the water used to calibrate TK-E5 followed by two heel dilutions of about 500 gallons each of demineralized water (DMW). This flush is for removing any dip tube and tank residues consisting of sediments or chemical crystals which may be present in the tank. High, medium, and low pressure dip tubes are flushed to remove any buildup of crystals or sediments which have a potential of plugging the tubes. If left in the tank the residue could cause erroneous results when the tank volume is calibrated.

Following the flush the tank is isolated. All tanks to be calibrated must be isolated to obtain a reliable calibration. It must be ensured that there are no leaks into or out of the tank and that evaporation or condensation is minimized during the time of calibration.

Following the isolation the tank calibrator is connected to the tank in preparation for the calibration.

The tank calibration establishes a relationship between tank volume and liquid level. The tank calibration system consists of a computer automated system that controls valves necessary to fill with demineralized water (DMW) a volumetric prover, weigh the prover before and after draining to the canyon process tank, determine the temperature of the prover and process tank, and determine the weight factor and specific gravity measurements after each addition to the process tank.

The minimum number of runs will be one (1) if the results are compatible with previous calibrations or more if there are unexplained differences. One calibration run should take 48 to 56 hours. The data collected during the calibration run will be printed on paper and stored on a floppy disk. This data will be statistically analyzed and a calibration curve fit made to be compared to previous calibration curves.

After the calibration the tank will be integrity checked by monitoring with the calibration RUSKAs to determine if the tank leaks.

After completion of the integrity assessment the tank calibrator is disconnected and the tank is restored for normal operations.

WORK PROCEDURE

TK-F18 CALIBRATION WP-P-90-11 PAGE 2 OF 25

II. PRESTART CONDITIONS

Canyon Change Order for route from E5 to F18.
Canyon Change Order for route from F18 to F13 to F7.
Canyon Change Order to remove the following jumpers from TK-F18:

1. Vessel Vent Header drainage on nozzle T10 to tank nozzle L.
2. Sampler Drain header on nozzle T5 to tank nozzle S.
3. Condenser Vent Header drainage on nozzle T4 to tank nozzle T.
4. Sump Drain Header on nozzle T3 to tank nozzle U.

III. SAFETY

None of the equipment involved with the calibration run will be set up in a radiation zone except for sampling of the tank. The provisions of General Regulations and Practices for Radiation Zone Work, GEN-0 and Radiation Work Procedures A-10 and A-15 shall apply to all work performed under this work plan.

IV. TOOLS, EQUIPMENT AND SUPPLIES

A. Dip tube flush.
   1. None required.

B. Tank flush.
   1. Sampler Procedure PO-080-032.

C. Isolation.
   1. Mechanics Stethoscope (leak detector).

D. Pre-calibration procedure.
   1. Craftsmen will supply their own tools.
   2. Rope barricade.
   3. Computer software floppy disk containing DATATEST.
   4. PUREX Tank Calibration System.

E. Calibration procedure.
   1. PUREX Tank Calibration System
   2. Computer software floppy disk containing PUTAC.
   3. At least 3 inch stack of printer paper.
   4. Computer floppy disk for data storage.
   5. Polyethylene sample bottles (1 oz. or larger).
   6. Sampler Procedure PO-080-032.

F. Tank Integrity Assessment.
   1. PUREX Tank Calibration System
   2. Computer software floppy disk containing PUTAC.
   3. At least 1 inch stack of printer paper.
   4. Computer floppy disk for data storage.

G. Post-calibration procedure.
   1. Craftsmen will supply their own tools.

WORK PROCEDURE

V. TABLE OF CONTENTS

VI. PROCEDURE

A. PERFORM TANK DIP TUBE FLUSH

1. Obtain supervisors signature for permission to perform TK-F18 flush.

Sup.sig. R.J Baum date 5-11-90

2. Per WP #2A90-00324 request that maintenance perform a dip tube flush using steam or air on WF diptubes.

NOTE: A hydraulic ram should be used only on plugged dip tubes.

3. Obtain shift supervision signature and date documenting completion of this step.

Sup.sig. R. S Baum date 5-11-90

B. PERFORM PRE-CALIBRATION TANK FLUSH

NOTE: A deep full tank flush should be made on the tank before a calibration run.

1. Bypass agitator low weight factor cutoff interlock
   a. Per WP #2A90-00324 have instrument technician install bypass on WFAS-F18-3 (low WF agitator cutoff).
   b. Place "CAUTION" tag on agitator start switch and write "LOW WF AGITATOR CUTOFF IS BYPASSED" on the tag.

Sup.sig. R. S Baum date 5-11-90

WORK PROCEDURE

2. Have Canyon Change Order CCO-90-036 issued to route tank calibration water used to calibrate TK-E5 to TK-F18. Have Canyon Change Order CCO-90-038 issued to route TK-F13 to TK-F7 for transfer of flush solutions.

Oper. Init./date

3. Transfer water in TK-E5 to tank TK-F18 for the first flush to weight factor of 69%.

DD 5-11-90 a. Use jet controller identified in the Canyon Change order for the transfer.

4. Have Canyon Change Order CCO-90-036 issued to remove the route installed to transfer tank calibration water from TK-E5 to TK-F18.

5. If TK-F18 weight factor is not at 69% after transfer from TK-E5 then add DMW to finish filling.

a. Close following valves:

NA F15-10 (Chem add line)
NA F15-12 (Chem add line)

b. Open following valves to transfer DMW into TK-F18:

NA F15-04 (Valve on DMW Header)
NA F15-06 (Valve on DMW add line)
NA c. Close valve F15-04.

6. Heat tank contents to 50-55 Degrees Celsius

a. Close following valves:

DD 5-11-90 F04-01 (Raw water header)
DD 5-11-90 F04-02 (Drain valve)
DD 5-11-90 F04-05 (Drain valve)
DD 5-11-90 F04-06 (Air header)
DD 5-11-90 F04-08 (Drain valve)

b. Apply steam to tank coils by opening valves:

DD 5-11-90 F04-03 (Steam header valve)
DD 5-11-90 F04-04 (Steam header valve)
DD 5-11-90 F04-07 (to PT-F18-1)

7. Continue to heat and agitate tank contents.

DD a. While tank contents are heating start TK-F18 agitator.
DD b. After tank contents are heated to 50-55 Degrees Celsius close valves:

DD F04-03 (Steam header valve)
DD F04-04 (Steam header valve)
DD c. Continue to agitate tank contents for at least 30 minutes.

WORK PROCEDURE

Oper.Init./date

8. Transfer tank contents.
   a. Transfer TK-F18 contents to TK-F13 using J-F18-3 (JC-F18-2) using applicable normal procedures for this transfer.

5-11-90 ______ b. Continue agitation while transfer is in progress until liquid level approaches weight factor of 10% and turn off agitator while continuing to jet to minimum heel.
   c. Obtain shift supervision's signature and date documenting completion of this step.

Sup.sig.______ date 5/11/90

Oper.Init./date

9. Dilute the tank heel concentration.
   5-13-90 a. Add about 30 inches (20% WF) of DMW to the tank by using valve F15-04.

10. Agitate tank contents.
   5-13-90 a. Start TK-F18 agitator.
   b. Agitate TK-F18 for at least 5 minutes.
   5-13-90 c. Stop TK-F18 agitator.

NOTE: Evaluate TK-F13 volume to be sure tank will not overflow. If necessary move enough of TK-F13 contents to TK-F7 for both heel dilutions using route installed for this transfer per CCO-90-038.

11. Transfer dilution flush.
   a. Transfer TK-F18 contents to TK-F13 using JC-F18_2.
   b. Follow applicable normal procedures for making the transfer.
   c. Obtain shift supervision's signature and date on check sheet documenting completion of this step.

Sup.sig.______ date 5-13

NOTE: A second partial flush is required to further dilute the heel concentration in the tank.

Oper.Init./date

12. Dilute the tank heel concentration.
   5-13 a. Add about 30 inches (20% WF) of DMW to the tank by using valve F15-04.

13. Agitate tank contents.
   5-13 a. Start TK-F18 agitator.
   b. Agitate TK-F18 for at least 5 minutes.
   5-13 c. Stop tank agitator.

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WORK PROCEDURE

14. Sample tank
    a. After agitating contents obtain a TK-F18 heel sample of the last dilution flush using PO-080-032.

NOTE: At least 2 mL sample should be collected, labeled and submitted to the laboratory for a specific gravity determination.

    b. When the specific gravity result is available record it in blank.

Specific Gravity .998 Oper.Init./date [illegible] 5/13/90

    c. Obtain shift supervision's signature and date on check sheet documenting completion of this step.

Sup.sig. [signature] date 5/13/90

NOTE: Evaluate TK-F13 volume to be sure tank will not overflow. If necessary move enough of TK-F13 contents to TK-F7 for transfer of heel dilution using route installed for this transfer per CCO-90-038. NOTE: MOVE ENOUGH F7 → F6 TO ALLOW EMPTYING F18. 5/13/9

15. Transfer last dilution flush.
    a. Transfer TK-F18 to TK-F13 using JC-F18-2.
    b. Follow applicable normal procedures for making the transfer.
    c. Obtain shift supervision's signature and date on check sheet documenting completion of this step.

Sup.sig. [signature] date 5/13/90

16. Obtain shift supervision's signature and date documenting completion of this section of work procedure.

Sup.sig. [signature] date 5/13/90

C. Isolation

NOTE: Do not begin this section of the work plan until supervisor has signed and dated the Approval to Isolate.

1. Approval to isolate

Sup.sig. [signature] date 5/14/90

2. Issue Canyon Change Order CCO-90-037 to remove from TK-F18 the following jumpers:
   a. Vessel Vent Header drainage on nozzle T10 to tank nozzle L.
   b. Sampler Drain header on nozzle T5 to tank nozzle S.
   c. Condenser Vent Header drainage on nozzle T4 to tank nozzle T.
   d. Sump Drain Header on nozzle T3 to tank nozzle U.

Oper.Init./date

3. Isolate the TK-F18 coil by closing the following manual valves in the P&O Gallery:

B RML 5-11	F04-01	(Raw water to coil)
B RML 5-11	F04-02	(Raw water drain valve)
B RML 5-11	F04-03	(Steam to coil)
B RML 5-11	F04-04	(Steam)
B RML 5-11	F04-05	(Steam drain valve)
B RML 5-11	F04-06	(Air to coil)
B RML 5-11	F04-07	(To PT-F18-1)
B RML 5-11	F04-08	(Drain valve)

Lock and tag each valve "CAUTION" and write "DO NOT OPERATE" on the tag. Initial and date when completed. Obtain Quality Control signature, stamp, and date to verify completion of this step.

Quality Control J. Tuttle (WHC QA/QC) date 5-11-90

B RML 5-11 4. Close the TK-F18 coil raw water DOV (DOV-F18-1) via VC-F18-1. Tag the valve controller "CAUTION" and write "DO NOT OPERATE" on the tag. Obtain Quality Control signature, stamp, and date to verify completion of this step.

Quality Control J. Tuttle (WHC QA/QC) date 5-11-90

Oper.Init./date

5. Close the following manual valves in the P&O Gallery and lock and tag each "CAUTION" and write "DO NOT OPERATE" on the tag. Check for leaks with the leak detector:

B RML 5-11	F02-01	(Seal pot isolation valve)
B RML 5-11	F02-02	(DMW)
B RML 5-11	F02-03	(Nitric acid to F18 tank)
B RML 5-11	F05-06	(Steam to F18 dip tubes)
B RML 5-11	F05-07	(Steam to F18 dip tubes)
B RML 5-11	324-301	(Utility add to F18 tank)
B RML 5-11	F15-10	(Chem add to F18 tank)
B RML 5-11	F15-12	(Chem add to F18 tank)
B RML 5-11	F18-01	(Steam to F18 tank)
B RML 5-11	F18-02	(Steam to F18 tank)

When no leakage can be detected, initial and date. Obtain Quality Control signature, stamp, and date to verify completion of this step.

Quality Control J Tuttle date 5-11-90

Oper. Init./date

6. Turn the following Jet controllers to "OFF" position:

B RMC 5-11	- JC-F3-3 (F3 to F18)
B RMC 5-11	- JC-F10-1 (F10 to F18)
B RMC 5-11	- JC-F18-1 (F18 to UGS)
B RMC 5-11	- JC-F18-2 (F18 to F13)
B RMC 5-11	- JC-M1-3 (TK-M1 to F18)
B RMC 5-11	- JC-SA (Sump SA to F18)
B RMC 5-11	- JC-SB (Sump SB to F18)
B RMC 5-11	- JC-SC (Sump SC to F18)
B RMC 5-11	- JC-SD (Sump SD to F18)
B RMC 5-11	- JC-SE (Sump SE to F18)
B RMC 5-11	- JC-SFA (Sump SFA to F18)
B RMC 5-11	- JC-SFB (Sump SFB to F18)
B RMC 5-11	- JC-SG (Sump SG to F18)
B RMC 5-11	- JC-SJ (Sump SJ to F18)
B RMC 5-11	- JC-SK (Sump SK to F18)
B RMC 5-11	- JC-SLK (Sump SLK to F18)

Tag each controller "CAUTION" and write "DO NOT OPERATE" on the tag. Obtain Quality Control signature, stamp, and date to verify completion of this step.

Quality Control J Tuttle date 5-11-90

7. Close and lock and CAUTION tag the following manual valves to shut off steam to part of the above transfer jets:

B RMC 5-11	- F09-01 (Steam supply to J-F18-1)
B RMC 5-11	- F10-04 (Steam supply to J-F18-3)
B RMC 5-11	- F126-07 (Steam supply to J-F10-1)
B RMC 5-11	- F243-04 (Steam supply to J-F3-3)

a. Write on CAUTION tag "TK-F18 CALIBRATION IN PROGRESS".
b. Check each of the above valves with leak detector. If leakage exists or is questionable, contact supervision. When no leakage can be detected initial and date. Obtain Quality Control signature, stamp and date to verify completion of this step.

Quality Control J Tuttle date 5-11-90

Oper.Init./date

8. Check the following Jet Gang Block Valve DOVs for leakage using the leak detector.

TB enc 5-11	DOV-J-F3-3(Block)	F3 to F18
TB enc 5-11	DOV-J-F10-1(Block)	F10 to F18
TB enc 5-11	DOV-J-F18-1(Block)	F18 to UGS
TB enc 5-11	DOV-J-F18-3(Block)	F18 to F13

If leakage exists or is questionable, contact supervision. When no leakage can be detected initial and date. Obtain Quality Control signature, stamp and date to verify completion of this step.

Quality Control J. Tittle (WHC 40 signature) date 5-11-90

9. Issue Canyon Change Order to remove the following jumpers from TK-F18:
   a. Vessel Vent Header drainage on nozzle T10 to tank nozzle L.
   b. Sampler Drain header on nozzle T5 to tank nozzle S.
   c. Condenser Vent Header drainage on nozzle T4 to tank nozzle T.
   d. Sump Drain Header on nozzle T3 to tank nozzle U.

Done 5/14 PS.

HOLD POINT: Do not continue until instructed to do so by supervision.

D. Pre-calibration Procedure

1. Per WP #2A90-00324 the prover/scale platform should be set up between instrument racks 37 and 38 in the P&O gallery. The computer/RUSKA cabinet should be set up between racks 38 and 39 in the P&O gallery. A barricade should be set up around the equipment to keep bystanders at least three feet away.

2. Level equipment
   a. Per WP #2A90-00324 using a level adjust the prover platform legs so that the platform is level.
   b. The scale should then be leveled by adjusting the support leg screws.
   c. Check the prover spirit levels and adjust the prover legs if necessary.
   d. Obtain Quality Control signature, stamp, and date documenting completion of this step.

Q.C.signature J.E. Vail (WHC 97 signature) date 5/14/90

WORK PROCEDURE

3. Agitator control
   a. Place a "CAUTION" tag on the agitator start switch in HECR and write on tag "CALIBRATION IN PROGRESS. AGITATOR IS CONTROLLED BY CALIBRATION COMPUTER".
   b. Per WP #2A90-00324 have an instrument technician remove the bypass on WFAS-F18-3 that was installed in step B.1.a and connect the computer agitator control cable to the amphenol connection from which WFAS-F18-3 was disconnected.
   c. Have an electrician install a bypass across the contacts on the start switch for the agitator in the HECR so that the computer can control the agitator.
   d. Obtain Quality Control signature, stamp, and date documenting completion of this step.

   Q.C.signature J.E. Vaile (WHC 97 QA/QC) date 5/14/90

4. Connect tank diptubes to calibration RUSKAs
   a. Have an HPT monitor this activity.
   b. Place a "CAUTION" tag on WFR-F18-1 and SGR-F18 in HECR and write on the tag "CALIBRATION IN PROGRESS".
   c. Per WP #2A90-00324 request a pipefitter and instrument technician make pneumatic connections between the calibration ports on WFT-F18 and SGT-F18 (dip tubes from nozzle FG5) located on instrument rack 38 and the appropriate ports on the calibration computer/RUSKA cabinet.
   d. Have the instrument technician pressurize to 10 psi and leak check and repair all leaking pneumatic connections on weight factor and specific gravity instrumentation.
   e. Obtain Quality Control signature, stamp, and date documenting completion of this step.

   Q.C.signature J Vaile (WHC 40 QA/QC) date 5-14-90

5. Thermohm Connection
   a. Place a "CAUTION" tag on TR-F18 in HECR and write on the tag "OUT OF SERVICE".
   b. Per WP #2A90-00324 request an instrument technician make the tie-in to line number XT-F268 in the instrument tray near the ceiling in the P&O gallery.
   c. Connect cable to the L&N nickel amphenol connector on the prover platform NEMA box.
   d. ~~Obtain supervision signature and date when this step is complete.~~ Obtain Quality Control signature, stamp, and date documenting completion of this step.

   Q.C.signature J.E. Vaile (WHC 97 QA/QC) date 5/14/90

Have pipefitter Replace broken

HR 5/

HR 5/

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WORK PROCEDURE

6. Connect prover drain to nozzle FG15
   a. HPT will monitor this activity.
   b. Per WP #2A90-00324 have pipe fitter remove top of Seal Pot and replace with the flange plate, elbow and hose connection used for addition of calibration water to the canyon tank.
   c. Connect prover drain line to flange plate installed on nozzle FG15 seal pot and to quick coupler on prover drain valve.
   d. Position portable support under drain flex line so that there is a continous slope from prover to nozzle FG56 so that no liquid will be held up in drain line.
   e. Obtain Quality Control signature, stamp, and date documenting completion of this step.

      Q.C.signature J.E. Veile WHC 97 A/QC date 5/14/90

7. Connect DMW line to prover
   a. Per WP #2A90-00324 have a pipe fitter remove line below valve F15-04 and install flange and hose quick coupler.
   b. Connect supply hose for prover to quick coupler on valve F15-04 and connect other end of supply hose to prover fill valve quick coupler.
   c. Open valves on inlet to tank TK-223 in AMU so that tank will not run out of water during calibration.
   d. Obtain Quality Control signature, stamp, and date documenting completion of this step.

      Q.C.signature J.E. Veile WHC 97 A/QC date 5/14/90

8. Electrical power
   a. Install "CAUTION" tag on the circuit breaker switch or box to ensure that power will not be removed from the computer and tank calibration instruments during the run.
   b. Obtain Quality Control signature, stamp, and date documenting completion of this step.

      Q.C.signature J.E. Veile WHC 97 A/QC date 5/14/90

9. Turn on system power switches
   a. Main power switch located in upper right corner on front of computer/RUSKA cabinet.
   b. The three RUSKA pressure transducers.
   c. Fluke translator
   d. HP 3421A Data Acquisition Control Unit
   e. Disk Drive for computer
   f. HP310 computer and monitor

WORK PROCEDURE

10. Boot the Computer
    a. Turn "OFF" the HP3421A Data Acquisition and Control Unit.
    b. Obtain tank calibration "System" floppy disk from supervision or process engineer (H.R. Risenmay) and insert in drive "0" (left hand drive).
    c. Turn the computer power off and back on to restart computer. The computer will load the system file found on the system disk and then run the menu software.
    d. Turn "ON" the HP3421A Data Acquisition and Control Unit.
    e. Select "Datatest" from the menu by pressing the "7" key and the "Return" key. "Datatest" is also located on the "System" disk so no disk changes will be required.

11. Check out connections to computer
    a. "Datatest" starts by continually checking the RUSKA connectons, the scale connections, and the Thermohm connections. There should be appropriate readings listed on screen for all of the above. When those connections appear correctly press function key "F8" to continue.
    b. Connections to the fill, drain, and agitator can now be checked by use of the function keys listed on screen. The indicator lights on the front of the computer/RUSKA cabinet light when the valves or the agitator are "ON" and go out when they are "OFF".
    c. Test all valves and the agitator for proper operation.
    d. The remaining portion of "Datatest" is not needed for this calibration. Press the "STOP" key on computer keyboard to discontinue program operation.

12. Remove the program disk from the disk drive. Leave power turned on to all calibration equipment. To obtain stable readings RUSKAs have to be powered up for at least 8 hours before calibration run can begin.

13. Obtain supervision signature and date to indicate that the pre-calibration procedure is complete. Obtain Quality Control signature, stamp, and date documenting completion of this step.

Sup.sig. R L Baus date 5-14-90 Q.C.sig. J. Tittl date 5-14-90

HOLD POINT: DO NOT continue with section E of this procedure until after recieving approval from supervision.

E. CALIBRATION PROCEDURE

1. Obtain approval to begin calibration run by obtaining supervision signature.

Sup.sig. R-S Burg date 5-14-90

2. Obtain the "PUTAC" software disk and the "Data" disk from supervision or the Process Engineer (H.R. Risenmay).

3. Obtain sample of DMW
   a. Label a 1 oz. or larger sample bottle with sample number and date.
   b. Carefully open valve on prover platform and fill sample bottle.
   c. Submit sample to lab for specific gravity determination.
   d. Record sample number and results on check sheet when results are available.
   e. Obtain Quality Control signature, stamp, and date documenting completion of this step.

      Q.C.signature J. Tittl date 5-14-90

4. Reboot computer
   a. Turn "OFF" the HP3421A Data Acquisition and Control Unit.
   b. Insert the "System" disk in drive "0" (left hand) and turn the computer "OFF" and back "ON". The computer will load the system file and run the menu software.
   c. Turn "ON" the HP3421A Data Acquisition and Control Unit.
   d. Remove the "System" disk and insert the "PUTAC" disk in the "0" drive (left hand) and the "Data" disk in the "1" drive (right hand).
   e. Select "PUTAC" software by pressing "1" and "Return". The computer will load and run the "PUTAC" software.

5. Prewet prover and lines
   a. The program will ask the operator if a prewet is desired. The operator should answer by pressing "Y" (for yes) and pressing "Return". The prover will automatically fill until the "Full Sensor" shuts off the fill valve.
   b. Follow directions on screen to finish filling prover to overflow by pressing function key "F1" to open fill valve and pressing "F2" to close fill valve.
   c. After prover is full press "F3" to open prover drain valve. Leave drain valve open for one minute after scale weight stabilizes indicating that the prover is empty.
   d. Close drain valve by pressing "F4".

6. Jet out pre-wet DMW addition
   a. Unlock and restore steam supply valve F10-04 to J-F18-3 (JC-F18-2) and jet tank contents to TK-F13 using normal procedures for that activity.
   b. Close and lock steam supply valve F10-04 opened above. Restore "CAUTION" labels removed to operate jet.
   c. Obtain supervision signature and date when this step is complete. Obtain Quality Control signature, stamp, and date documenting completion of this step.

Sup.sig. R. L Bauer date 5-14-90 Q.C.sig. J Tuttle (WHC QC STA.) date 5-14-90

HOLD POINT: DO NOT continue computer program until after jetting tank contents.

7. Continue with tank calibration program by pressing special function key "F8" (from the "PREWET" subroutine).

8. Answer all questions printed on the computer CRT screen by typing in the response and pressing the "Return" key.
   a. Tank ID is "F18".
   b. Operator ID is your first two initials and last name.
   c. Tank volume is 5000 gallons.
   d. Run number is the year (90) plus a dash plus whichever run is being performed (1).
   e. Enter todays date.
   f. Software will now give you a chance to correct mistakes made in entering data. Follow directions on CRT screen.

9. Enter Ambient data requested
   a. Empty prover weight (wet) is found on the scale readout on top of computer cabinet (about 152 pounds).
   b. Use sling psychrometer to determine relative humidty.
   c. You can get the room temperature from the "DRY" bulb thermometer of the sling psychrometer.
   d. Enter barometric pressure found on barometer.
   e. "Empty tank RUSKA reading" to enter is found on the top digital display (long).
   f. Input "Y" (yes) to use the tank agitator.
   g. Input "15" inches to cover agitator.
   h. Input "90" inches for maximum level to use agitator.
   i. Input "2" for "TANK OVERFLOW CALIBRATION".
   j. Software will now give you a chance to correct mistakes made in entering data. Follow directions on CRT screen.

10. Enter RTD type
    a. Input "1" for L&N nickel RTD.
    b. Software will now give you a chance to correct mistakes made in entering data. Follow directions on CRT screen.

11. Printer preparation
    a. The "ON" switch for the printer is found in the back right hand corner. Control panel lights will be lighted when printer is on.
    b. The "ON-LINE" red light should be lighted. Pressing the "ON-LINE" button will toggle the printer from "ON-LINE" to "OFF-LINE"(red light not lighted) and back.
    c. When printer is turned "ON" and "ON-LINE" press special function key "F5" for "CONTINUE" as shown on menu at bottom of CRT screen.

12. Preparation of Floppy disk for data storage
    a. "PUTAC" disk should be in "0" drive (left hand) and "DATA" disk should be in "1" drive (right hand).
    b. When disks are correctly positioned press special function key "F5" for "CONTINUE" as shown on menu at bottom of CRT screen.
    c. Software will now prepare files on "DATA" disk for data storage. If there are any problems encounter by the software, directions will appear on CRT screen for how to correct them.

13. Set purge air rate
    a. Check purgerator air flow rate for the FG5 nozzel dip tubes in the HECR and adjust to "1.0" SCFH.
    b. When purge rate is correct press special function key "F5" for "CONTINUE" as shown on menu at bottom of CRT screen.

14. Set number of prover dumps to take RUSKA readings
    a. Input "1" for taking data on every prover dump.

15. Adjust RUSKAs for zero reading.
    a. Per WP #2A90-00324 request an instrument technician to CLOSE the isolation valves associated with each dip tube on the instrument rack and VENT the three RUSKA pressure transducers to atmosphere by opening VENT valve on computer cabinet.
    b. Have instrument technician adjust RUSKA pressure transducers to zero reading as directed on CRT screen.

c. When RUSKAs have been zeroed press special function key "F5" for "CONTINUE" as shown on menu at bottom of CRT screen.

d. After the computer prints out the results record the initial (zero) readings for the long tube pressure transducer on the PUREX Tank Calibration Data Sheet.

NOTE: The number on the print out will not match the digital readouts because the computer converts psi to cm. H2O. Be sure to observe the sign in front of the number on the digital readout. Record a "+" or "-" before the number as indicated.

e. Per WP #2A90-00324 request an instrument technician to CLOSE the VENT valve opened above and OPEN the isolation valves closed above.

16. Sump level checks

a. Determine sump SF level from WFR-SFB in CCR and record on PUREX Tank Calibration Data Sheet.

b. On a regular basis the operator should check the sump recorder WFR-SFB to be certain that the sump liquid level has not increased indicating a leak.

17. Calibration run by computer.

a. The tank calibrator is automated so that continual operator involvement is not required. The operator should observe the progress of the calibration for the first hour to ensure that the software does not have any bugs develope.

b. After the first hour the operator does not have to be in constant attendance. Hourly checks by operator to check for error messages on screen or other malfunctions should suffice. Supervisor will determine whether the operator shall be in attendance during the entire tank calibration run or if hourly checks are acceptable.

c. If a problem occurs which the operator cannot handle, the Shift Supervisor and/or the Process Engineer should be consulted.

NOTE: If necessary contact in this order the following persons:

NAME	WORK PHONE	HOME PHONE	PAX
H. Rees Risenmay	373-3179	932-4637	304
J. Lee Geiger	373-4209	943-6280	304
Mark B. Enghusen	373-2940	375-5322	304

18. Final Vent readings
    a. At the completion of the tank calibration, as instructed by the computer on the CRT screen, per WP #2A90-00324 request an instrument technician to CLOSE the isolation valves associated with each dip tube on the instrument rack and VENT the three RUSKA pressure transducers to atmosphere by opening VENT valve on computer cabinet.
    b. Record the final readings (vent) for the long tube pressure transducer on the PUREX Tank Calibration Data Sheet.

NOTE: Be sure to observe the sign in front of the number on the digital readout. Record a "+" or "-" before the number as indicated.

19. Zero the RUSKAs
    a. Per WP #2A90-00324 request an instrument technician to zero the three RUSKAs.
    b. Record the final readings (zero) for the long tube RUSKA pressure transducer on the PUREX Tank Calibration Data Sheet.

NOTE: Be sure to observe the sign in front of the number on the digital readout. Record a "+" or "-" before the number as indicated.

    c. Per WP #2A90-00324 request an instrument technician to close the atmospheric vent valve and open the isoaltion valves closed in step IV.E.18.a above.

20. Final tank readings
    a. Record the final tank (leak) readings for the long tube pressure transducer on the PUREX Tank Calibration Data Sheet.

21. Sump level check
    a. Check WFR-SFB in CCR to be certain there was no liquid level increase during the calibration except when the calibration water overflowed at the end of the calibration.
    b. Record sump level ~~on PUREX Tank Calibration Data Sheet.~~

22. Close valves on inlet to tank TK-223 in AMU so that tank will not overflow now that calibration is complete.

23. Ordinarily one would let the tank and equipment sit for 4 to 8 hours to check for leaks in the system. However, we are going to do a tank integrity assessment now so this program can be finished now without waiting.

HR 5/12/9
51 RH
RH 5/12/9

WORK PROCEDURE

24. Post-calibration (leak) readings
    a. Record the Post-Calibration (leak) readings for the long tube pressure transducer on the PUREX Tank Calibration Data Sheet.

25. Post-Calibration Vent readings
    a. Per WP #2A90-00324 request an instrument technician to CLOSE the isolation valves associated with each dip tube on the instrument rack and VENT the three RUSKA pressure transducers to atmosphere by opening VENT valve on computer cabinet.
    b. Record the Post-Calibration (vent) long tube reading on the PUREX Tank Calibraton Data Sheet.

NOTE: Be sure to observe the sign in front of the number on the digital readout. Record a "+" or "-" before the number as indicated.

    c. Per WP #2A90-00324 request instrument technician CLOSE the VENT valve opened above and OPEN the isolation valves closed above.

26. Sample tank TK-F18
    a. A sample of the tank contents should be taken using procedure PO-080-032.

NOTE: At least 2 mL sample should be collected, labeled, and submitted to the laboratory for a specific gravity determination.

    b. When available record the sample number and the final tank specific gravity determined by the laboratory on the PUREX Tank Calibration Data Sheet.

27. Turn in Data
    a. When the calibration is finished turn in the System disk, PUTAC disk, the DATA disk, the printer paper data, and the PUREX Tank Calibration Data Sheet to supervision.
    b. Process Engineering will process the data generated.

HOLD POINT: DO NOT continue with jet out of tank until receiving approval by supervision.

WORK PROCEDURE

TK-F18 CALIBRATION WP-P-90-11 PAGE 19 OF 25

28. Jet out about 2 inches of water in the tank to start integrity assessment.
    a. Unlock and restore steam supply valve F10-04 for J-F18-3 (JC-F18-2) and jet two inches of the tank contents to TK-F13 using normal procedures for that activity.
    b. Close and lock steam supply valve F10-04 opened above. Restore "CAUTION" labels removed to operate jet.
    c. If more than 2 inches was jetted out use prover to add water to get to the correct level again.
    d. Obtain supervision signature and date when this step is complete. Obtain Quality Control signature, stamp, and date documenting completion of this step.

Sup.sig. [signature] date 5-17-90 Q.C.sig. [signature] date 5/17/90

F. TANK INTEGRITY ASSESSMENT

1. Insert floppy disk with "INTEGRITY" software into drive "0".

2. Insert floppy disk for data storage into drive "1".

3. On keyboard type LOAD "INTEGRITY" and press "RETURN".

4. Type RUN and press "RETURN".

5. Answer all questions printed on the computer CRT screen by typing in the response and pressing the "Return" key.
    a. Tank ID is "F18"
    b. Operator ID is your first two initials and last name.
    c. Tank volume is 5000 gallons.
    d. Run number is the year (90) plus a dash plus whichever run is being performed (1).
    e. Enter todays date.
    f. Enter cycle time of "1" hour.
    g. Enter number of cycles to run as "24".
    h. Software will now give you a chance to correct mistakes made in entering data. Follow directions on CRT screen.

6. Enter RTD type
    a. Input "1" for L&N nickel RTD.
    b. Software will now give you a chance to correct mistakes made in entering data. Follow directions on CRT screen.

7. Printer preparation
   a. The "ON" switch for the printer is found in the back right hand corner. Control panel lights will be lighted when printer is on.
   b. The "ON-LINE" red light should be lighted. Pressing the "ON-LINE" button will toggle the printer from "ON-LINE" to "OFF-LINE"(red light not lighted) and back.
   c. When printer is turned "ON" and "ON-LINE" press special function key "F5" for "CONTINUE" as shown on menu at bottom of CRT screen.

8. Preparation of Floppy disk for data storage
   a. "INTEGRITY" disk should be in "0" drive (left hand) and "DATA" disk should be in "1" drive (right hand).
   b. When disks are correctly positioned press special function key "F5" for "CONTINUE" as shown on menu at bottom of CRT screen.
   c. Software will now prepare files on "DATA" disk for data storage. If there are any problems encounter by the software, directions will appear on CRT screen for how to correct them.

9. Set purge air rate
   a. Check purgerator air flow rate for the FG48 nozzel dip tubes in the HECR and adjust to "1.0" SCFH.
   b. When purge rate is correct press special function key "F5" for "CONTINUE" as shown on menu at bottom of CRT screen.

10. Adjust RUSKAs for zero reading.
   a. Per WP #2A90-00324 request an instrument technician to CLOSE the isolation valves associated with each dip tube on the instrument rack and VENT the three RUSKA pressure transducers to atmosphere by opening VENT valve on computer cabinet.
   b. Have instrument technician adjust RUSKA pressure transducers to zero reading as directed on CRT screen.
   c. When RUSKAs have been zeroed press special function key "F5" for "CONTINUE" as shown on menu at bottom of CRT screen.
   d. After the computer prints out the results record the initial (zero) readings for the long tube pressure transducer on the PUREX Tank Assessment Data Sheet.

NOTE: The number on the print out will not match the digital readouts because the computer converts psi to cm. H2O. Be sure to observe the sign in front of the number on the digital readout. Record a "+" or "-" before the number as indicated.

e. Per WP #2A90-00324 request an instrument technician to CLOSE the VENT valve opened above and OPEN the isolation valves closed above.

11. Assessment run by computer.
   a. The tank calibrator is automated so that continual operator involvement is not required. The operator should observe the progress of the assessment until the first wait period starts.
   b. After the wait period starts the operator can make twice a shift checks for error messages on screen and to observe if the print out of data is progessing normally.
   c. If a problem occurs which the operator cannot handle, the Shift Supervisor and/or the Process Engineer should be consulted.

NOTE: If necessary contact:

NAME	WORK PHONE	HOME PHONE	PAX
H. Rees Risenmay	373-3179	932-4637	304

12. Final Vent readings
   a. At the completion of the tank assessment, as instructed by the computer on the CRT screen, per WP #2A90-00324 request an instrument technician to CLOSE the isolation valves associated with each dip tube on the instrument rack and VENT the three RUSKA pressure transducers to atmosphere by opening VENT valve on computer cabinet.
   b. Record the final readings (vent) for the long tube pressure transducer on the PUREX Tank Assessment Data Sheet.

NOTE: Be sure to observe the sign in front of the number on the digital readout. Record a "+" or "-" before the number as indicated.

13. Zero the RUSKAs
   a. Per WP #2A90-00324 request an instrument technician to zero the three RUSKAs.
   b. Record the final readings (zero) for the long tube RUSKA pressure transducer on the PUREX Tank Calibration Data Sheet.

NOTE: Be sure to observe the sign in front of the number on the digital readout. Record a "+" or "-" before the number as indicated.

WORK PROCEDURE

c. Per WP #2A90-00324 request an instrument technician to close the VENT valve and open the demivalves closed in step IV.F.12.a above.

14. Final tank readings
    a. Record the final tank (zeroed) readings for the long tube pressure transducer on the PUREX Tank Assessment Data Sheet.

15. Turn in Data
    a. When the assessment is finished turn in the System disk, INTEGITY disk, the DATA disk, the printer paper data, and the PUREX Tank Assessment Data Sheet to supervision.
    b. Process Engineering will process the data generated.

HOLD POINT: Have PUREX Regulatory Compliance personnel examine data printout before proceeding with next section of procedure.

O. K. L. P. Clay Purex Reg Compliance May 18, 1990 0750

G. POST-CALIBRATION PROCEDURE

1. Approval to Restore tank
    a. Obtain supervision signature and date approving the disconnection of the tank calibration equipment and restoration of tank.

Sup.sig. [signature] date 5-18-90

Oper. Init./date

RL 5-18-90 Remove "CAUTION" tag on the circuit breaker switch or box installed in step VI.D.8.a.

3. Per WP #2A90-00324 have pipe fitter restore equipment that was changed to route DMW to flush and calibrate TK-F18.
    a. HPT will monitor this activity.
    b. Remove flex hose from valve F15-04 and prover fill valve.
    c. Remove hose connector on valve F15-04.
    d. Disconnect flex hose from prover drain valve and remove the flange plate installed on the seal pot.
    e. Reinstall piping removed from seal pot and chem add line.
    f. Obtain Quality Control signature, date and stamp verifying completion of this step.

Quality Control J. E. Vail (WHC QC 97) Date 5/18/90

WORK PROCEDURE

Oper.Init./date

RH 5-18-90 4. Per WP #2A90-00324 have instrument technician remove computer cable tie-in to line XT-F268 from instrument tray, as installed in step VI.D.5.b. Remove "CAUTION" tag from HECR on TR-F18-1.

CH 5-18-90 5. Per WP #2A90-00324 have pipe fitter and instrument technician remove the connections to the nozzle FG5 diptubes installed in step VI.D.4.c. Remove caution tag in HECR from WFR-F18-1 and SGR-F18.

RH 5-18-90 6. Per WP #2A90-00324 have electrician remove bypass on start switch for TK-F18 agitator and instrument technician disconnect computer cable and reconnect output cable from WFAS-F18-3 installed in step VI.D.3.b,c. Remove "CAUTION" tag from agitator start switch in HECR.

RH 5-18-90 except 324-301 7. Remove lock and tags from all equipment installed in part C steps 3-9. Initial and date after completion of this step.

8. Issue Canyon Change Order CCO-90-037 to reinstall on TK-F18 the following jumpers:
   a. Vessel Vent Header drainage on nozzle T10 to tank nozzle L.
   b. Sampler Drain header on nozzle T5 to tank nozzle S.
   c. Condenser Vent Header drainage on nozzle T4 to tank nozzle T. ← DUNWOODY & FINNEY BYOL
   d. Sump Drain Header on nozzle T3 to tank nozzle U.

9. Obtain supervision signature upon completion of restoration.

Sup.sig. R L May date 6-22-90

NOTE: Do not restore original configuration of route installed for transfer of solutions from TK-F13 to TK-F7 per Canyon Change Order CCO-90-038. This route will be needed for calibration of TK-F15 and Integrity Assessment of TK-F16 which are next on the schedule.

Update HR 5/14/90

WORK PROCEDURE

TK-F18 CALIBRATION WP-P-90-11 PAGE 24 OF 25

PUREX Tank Calibration Data Sheet

Tank: TK-F18
Run Number(Yr-No): 90-1

DATE: 5/14/90
Operator: HR

SPECIFIC GRAVITY SAMPLE RESULTS

Initial Tank Heel: 0.998

Demineralized Water: _____

Final Tank Sample: _____

SUMP READINGS

Starting Reading: _____

Final Reading: 51%

STARTING AMBIENT CONDITIONS

Time: 18:00

Room Temperature: 74 °F

Barometric Pressure: 29.015 Inches Hg

Relative Humidity: 54 %

RUSKA PRESSURE TRANSDUCER READINGS

Initial (zero): -.0012

Final (vent): 0.0461

Final (zero): 0.0447

Post Calibration (leak): 273.16

Post Calibration (vent): 0.0452

WORK PROCEDURE

TK-F18 CALIBRATION WP-P-90-11 PAGE 25 OF 25

PUREX Tank Assessment Data Sheet

Tank: TK-F18 DATE: 5/17/90
Run Number(Yr-No): 90-1 Operator: HR

RUSKA PRESSURE TRANSDUCER READINGS

Initial (zero): -0.0000
Initial (tank): 268.4732
Final (tank): 268.5364
Final (vent): 0.0054
Final (zero): 0.0000
After zero (tank): 268.5364

HAZARD ANALYSIS CHECKLIST

DATE: 4/18/90 PROCEDURE: WP-P-90-11

SIGNATURE: H. Rees Rueennmy Rev/Mod: A-0

I. SAFETY DOCUMENTS REVIEW	DOC. NO.	REVIEWED? YES	NO	N/A	IDENTIFIED HAZARDS OR SAFETY REQUIREMENTS RELEVANT TO PROCEDURE? (YES OR NO)
OSR'S		✓			NO
SAR/SAD		✓			↓
SARP		✓			↓
ALARA PLAN		✓			↓
RWP'S		✓			↓
CRITICALITY SPECS		✓			↓
OPERATING SPECS		✓			↓
HOOD POSTINGS				✓	↓
OTHERS (LIST)				✓	↓

II. TASKS	DESCRIPTION	PREVENTIVE MEASURE
A	Flush Diptube	None Required
B	Flush Tank	
C	Isolation	
D	Pre Calibration	
E	Calibration	
F	Assessment	
G	Post-Calibration	

III. TASK HAZARD	TASK A	B	C	D	E
CAN COMBINATION OF OPERATING CONDITIONS, OPERATOR ERROR OR EQUIPMENT MALFUNCTION RESULT IN ANY OF THE FOLLOWING?					
o FIRE OR EXPLOSION	N	—	—	—	—
o CRITICALITY	N	—	—	—	—
o RADIATION EXPOSURE	N	—	—	—	—
o UNCONTROLLED CONTAMINATION SPREAD	N	—	—	—	—
- RADIOACTIVE RELEASE THRU LIQUIDS, GASES, OR SOLIDS	N	—	—	—	—
- TOXIC LIQUIDS, GASES, PARTICLES RELEASE	N	—	—	—	—
o INJURY TO PERSONNEL (TO BE IDENTIFIED FURTHER IN PART IV)	N	—	—	—	—
o DAMAGE TO EQUIPMENT OR FACILITY	N	—	—	—	—
o SIGNIFICANTLY IMPAIRING THE PROCESS/PROGRAM WORK	N	—	—	—	—
o DEGRADATION OR LOSS OF PRODUCT	N	—	—	—	—
o OTHER (LIST)	N	—	—	—	—

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Figure 2 - Procedure Hazard Analysis Checklist

HAZARD ANALYSIS CHECKLIST

IV. INDUSTRIAL HAZARDS - IS THERE A CHANCE FOR : (circle specific items)

1. People to make contact with material or equipment that can burn, corrode, irritate, cut, abrade, poison, asphyxiate, electrocute, drown or otherwise injure them.

Task/Activity	A	B	C	D	E
N					

F,G

-Equipment, hand tools, or material with sharp edges, corners, points, or rough surfaces; apt to have slivers.

-Equipment, hand tools, or instruments with potential for electric shock or arcing.

-Material that is pressurized, hot, molten; can squirt, bubble, splash, or be burped; contaminated.

-Equipment, tools, or material that can get hot by way of friction, steam, open flame, or electrical resistance.

-Chemicals that are irritating or poisonous on contact, inhalation or ingestion; corrosive, flammable or explosive; dangerous in quantity, in improper storage containers, when stored near reactive chemicals or when disposed of.

-Hot material whose temperature is not obvious.

-Action requirements that are monotonously repetitive, need special attention, cooperative action, or special communication.

2. People to be struck by or against something that can bruise, crush, puncture, scrape, cut, scratch, blind or otherwise wound them.

Task/Activity	A	B	C	D	E
N					

F,G

-Equipment and hand tools that are hot, easily broken; apt to be faulty, have loose parts; apt to tip, fall or slip, glance.

-Flying particles that are hot, molten or sharp; impelled by high speed equipment, being snapped or chipped off, or carried by wind; easily dislodged or under prssure.

-Potential insect or snake bites.

-Action requirements with motions causing constant irritation.

-Outside locations with blowing dust or sand.

3. People to be caught on, in, by or between objects that can crush, puncture, pinch, trap, fracture, sever or otherwise injure them.

Task/Activity	A	B	C	D	E
N					

F,G

-Moving machinery that can catch, jam or snag clothing; be operated unintentionally, be controlled from more than one point; be operated without prior inspection, preparation, or approval; not properly locked or tagged.

-Material that is heavy or awkward to move, grip, or load; can fall, roll, tip, slide, get stuck; is brittle, under stress, apt to be improperly carried or lifted.

-Confined quarters with danger of being trapped.

-Action requirements that cause instinctive reactions, excessive force; sudden actions or force applied toward body.

4. People to trip or fall.

Task/Activity	A	B	C	D	E
N					

F,G

-Walkways that are apt to be slick, wet, oily; are cluttered, rough, uneven, soft; have poor visibility, high traffic, steep gradients.

-Locations that have poor visibility, inadequate lighting, unsure footing or poor weather conditions; are above or below ground/floor level, or require a ladder, scaffold or access stairway; induce taking dangerous short-cuts.

-Action requirements that may cause slipping, falling, off balance or stumbling, misjudging distances.

5. People to overexert themselves so that they receive strains or sprains, faint, become ill or otherwise injure themselves - for example:

Task/Activity	A	B	C	D	E
N					

F,G

-Material, equipment, or tools that are heavy, awkward; apt to be improperly lifted or carried; need special equipment or twisting motion to move

-Locations with cramped quarters, inadequate air supply, or excessive heat and humidity

-Action requirements that cause strain in applying effort.

6. People to be exposed to excessive or inadequate heat, noise, air pressure, humidity, or light.

Task/Activity	A	B	C	D	E
N					

F,G

-Locations with confined quarters with danger of asphyxiation high heat or humidity

-Outside location exposed to high winds, extreme temperatures or rain.

7. Workers to be provided erroneous, inadequate or confusing data or instructions that could cause them to make errors.

Task/Activity	A	B	C	D	E
N					

F,G

-Instruments that are prone to malfunction or go out of calibration frequently or are difficult to read properly or often misread because of scale changes

-Hard to identify valves or other equipment

-Conditions that prevent ready access to procedures

-Poor communication facilities between co-workers or supervision.

V. FACILITY SPECIFIC HAZARDS - (to be prepared by responsible process engineer as required)

None Required

FIGURE 2 - PROCEDURE HAZARD ANALYSIS CHECKLIST (Cont.)

PROBABILITY	CONSEQUENCES		
	NOT SIGNIFICANT	SIGNIFICANT	SEVERE
HIGHLY UNLIKELY	0	0	1
NOT LIKELY BUT CREDIBLE	0	1	2
GOOD CHANCE	1	2	3

TABLE 2

TYPE OF CONSEQUENCE	NOT SIGNIFICANT	SIGNIFICANT	SEVERE
PERSONNEL INJURY (0)	o FIRST AID ONLY	o TYPE B ACCIDENT INVESTIGATION o LOST TIME o HEARING IMPAIRMENT	o TYPE A ACCIDENT INVESTIGATION o DISABLING INJURY o LOSS OF LIFE
RADIOACTIVE EXPOSURE (0)	o DOSE WITHIN WEEKLY LIMIT o CLOTHING, EQUIPMENT CONTAMINATION, NO SKIN CONTAMINATION	o DOSE RATE ABOVE WEEKLY LIMIT, BELOW ANNUAL LIMIT o SKIN CONTAMINATION o CONTAMINATED INJURY	o SINGLE EXPOSURE OVER ANNUAL LIMITS o VISITOR RADIATION EXPOSURE ABOVE LIMITS o DETECTABLE INTERNAL DEPOSITIONS
EQUIPMENT/FACILITY DAMAGE (0)	< $1000 TO REPAIR	$1000 - $50,000 DOE TYPE C INVESTIGATION	> $50,000 DOE TYPE A OR B INVESTIGATION
PROCESS/PRODUCT DEGRADATION (0)	WASTE AND PRODUCT REMAINS WITHIN SPECS	REWORK NEEDED	EXTENSIVE PROGRAMMATIC IMPACT
DAMAGE TO ENVIRONMENT (0)	RELEASES REMAIN WITHIN PLANT STANDARDS	NON-ROUTINE RADIOACTIVE RELEASE QUALIFYING AS POTENTIAL UNUSUAL OCCURENCE (SEE RHO-MA-139, PART B, NON-RAD RELEASE ABOVE STANDARDS IN PARTS C & E)	ABOVE DOE STANDARDS FOR TYPE A OR B INVESTIGATIONS
CONTINUITY OF OPERATION (0)	PARTIAL, TEMPORARY SHUTDOWN WITH INSIGNIFICANT PROGRAMMATIC IMPACT	TEMPORARY SHUTDOWN MINOR PROGRAM IMPACT	EXTENSIVE PROGRAM DELAY
MISCELLANEOUS (0)		FIRE/EXPLOSION OCCURENCE LIKELY TO HAVE PUBLIC OR PRESS INQUIRY OR PRESS RELEASE	CRITICALITY INCIDENT

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APPENDIX B
TK-U3 WORK PROCEDURE

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DOCUMENT ACCEPTANCE REVIEW FORM

Page 1 of 18

DOCUMENT

Work Procedure (Type) WP-P-90-25 (No.) A-0 (Rev./Mod.)

Impact Level: 3

TK-U3 Integrity Assessment (Title)

Prepared By

H.R. Risenmay (Name)

PPE (Title/Organization)

☒ New or Revised Document – Full Review Required

☐ Modification – Changed Pages _____

☒ Full Review Required

☐ Review Limited to Change Pages/No Preliminary Review Required

☐ Administrative Change – } No Review and Approval required except for the approval authority's.

☐ PCA – Approved Changes Only – }

PCAs and DCRs	
Incorporated	Not Incorporated
	Cancel
	1
	2 Reissue
	1
	2

Work Station Copy Distribution

Changes to Information Copy Distribution

ADVICE AND SERVICE MEMBER SIGNATURES

DOCUMENT IS ACCEPTABLE As Is	ACCEPTABLE With Changes Noted	NOT ACCEPTABLE Objections on Continuation or Attached	(Signature)	(Title/Org.)	(Date)
☒	☐	☐	H.R. Risenmay	Sr Engr/PPE	8/21/90
☐	☒	☐	[illegible]	Sr Engr/PPE	8/16/90
☐	☒	☐	[illegible]	[illegible]	8/16
☐	☒	☐	[illegible]	[illegible]	[illegible]
☐	☒	☐	[illegible]	[illegible]	[illegible]
☐	☒	☐	Stuart Abbott	PUREX OPERATIONS SHIFT SUPERVISOR	8-21-90
☐	☐	☐			

ACCEPTANCE REVIEW CHAIRMAN

(Signature) _____ (Title/Org.) _____ (Date) _____

ACCEPTANCE REVIEW CHAIRMAN

☒ All objections resolved

☐ Unresolved issue exists

[signature] (Signature) PPE (Title/Org.) 8/21/90 (Date)

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WORK PROCEDURE

TK-U3 INTEGRITY ASSESSMENT WP-P-90-25 PAGE 1 OF 13

I. SYSTEM DESCRIPTION

This work plan provides instructions for performing isolation of tank, connection of RUSKA equipment, tank integrity assessment, and restoration of tank for normal service.

All tanks to be assessed must be isolated to obtain a reliable assessment. It must be ensured that there are no leaks into or out of the tank and that evaporation or condensation is minimized during the time of the assessment.

The tank calibrator is connected to the tank diptubes in preparation for the assessment.

The tank assessment establishes that the tank liquid level does not change over the time the run is made which indicates that the tank does not leak. The tank assessment system consists of a computer automated system that determine the temperature of the process tank and the weight factor and specific gravity readings of the dip tubes of the process tank.

One assessment run will last 24 hours or more. The data collected during the assessment run will be printed on paper and stored on a floppy disk. This data will be statistically analyzed to determine if any leaks occured during the run.

After completion of the integrity assessment the tank calibrator is disconnected and the tank is restored for normal operations.

The tank calibrator can be hooked up to the diptubes at anytime before the assessment starts. The connection of the tank calibrator does not impare the use of the HECR instruments used to make the transfers into the tank. The different steps in the isolation and connection of the calibration equipment can be performed in any order.

II. PRESTART CONDITIONS

Canyon Change Order CCO-90-048 must be in place to move water in TK-G7 to TK-F3. Water will then follow ordinary route to TK-U5 and from TK-U5 by gravity drain to TK-U3. The route from TK-U3/U4 to UGS must be rerouted to TK-D1 to empty the tank after the assessment.

Arrangements must be made to stop all activities in the P&O gallery that could cause a spill to the floor drains. The floor drains will have to be diverted to the Chemical Sewer during the test in order to isolate the tank.

III. SAFETY

None of the equipment involved with the assessment run will be set up in a radiation zone but several valves are located in U cell that have to be closed. The provisions of General Regulations and Practices for Radiation Zone Work; GEN-0 and Radiation Work Procedures A-10 and A-15 shall apply to all work performed under this work plan.

All activities in the P&O gallery must be discontinued that could cause a spill to the floor drains which have to be diverted to the Chemical Sewer during the test in order to isolate the tank. A spill would go to the environment while the floor drains are diverted.

IV. TOOLS, EQUIPMENT AND SUPPLIES

A. LEAK CHECK DIPTUBES
   1. Craftsmen will supply their own tools.

B. MOVE ASSESSMENT WATER TO TK-U3
   1. None.

C. Isolation.
   1. Mechanics Stethoscope (leak detector).

D. Pre-Assessment procedure.
   1. Craftsmen will supply their own tools.
   2. Computer software floppy disk containing DATATEST.
   3. PUREX Tank Calibration System.

E. Tank Integrity Assessment.
   1. PUREX Tank Calibration System
   2. Computer software floppy disk containing INTEGRITY.
   3. At least 1 inch stack of printer paper.
   4. Computer floppy disk for data storage.

F. Post-Assessment procedure.
   1. Craftsmen will supply their own tools.

V. TABLE OF CONTENTS

WORK PROCEDURE

TK-U3 INTEGRITY ASSESSMENT WP-P-90-25 PAGE 3 OF 13

VI. PROCEDURE

A. LEAK CHECK DIPTUBES

1. Have an HPT monitor this activity as needed.

Oper. Init./date

BVA 10-5-90 Place a "CAUTION" tag on WFR-U3 and SGR-U3 in HECR and write on the tag "TK-U3 INTEGRITY ASSESSMENT IN PROGRESS".

3. Have the instrument technician pressurize to 10 psi or greater and leak check and repair all leaking pneumatic connections on weight factor and specific gravity instrumentation. If the pneumatic tubing is in bad condition on the instrument rack replace with new tubing and fittings as needed.

NOTE TO PLANNING: New tubing and fittings should be ordered as needed to refurbish the connections on the instrument rack.

9W13276.1294

B. MOVE ASSESSMENT WATER TO TK-U3.

1. Move water in TK-G7 to TK-F3.

a. Ensure that TK-G7 to TK-F3 route is in place. Done JB 10-8-90

b. Turn on pump P-G7-2 with MS-G7-2 to move water in TK-G7 to TK-F3. (Rerouted by PCO-90-048) Done BJB 9/14/90

c. Observe rise in TK-F3 on WFR-F3 and turn off pump P-G7-2 when weight factor reaches ~~68%~~ 45. (LB is overflow)

2. Move water in TK-F3 to TK-U5.

a. Close following valves in U cell:

Oper. Init./date

BVA/10-5-90	U1-05
BVA/10-5-90	U2-06
BVA/10-5-90	U2-22

Left in correct position & shut down. BJB

b. Open following valve in U cell:

BVA/10-5-90	U2-21

c. Turn on pump P-F3 with MS-F3-2 and run until WFAS-F3-4 turns off pump.

3. Move water in TK-U5 to TK-U3.

a. Set VS-U3 to U3 position to route water to TK-U3.

b. Close following valves in ~~U cell~~: FRACTIONATOR

BVA/10-5-90	U5-03	Inlet to pump P-U5-1
BVA/10-5-90	U5-05	Inlet to pump P-U5-2

c. Open following valves in ~~U cell~~: Fractionator

BVA/10-5-90	U5-01	TK-U5 outlet valve
BVA/10-5-90	U5-02	Gravity drain to TK-U3

d. Turn on JC-SUB (Sump SUB to TK-U3) and begin jetting SUB sump to TK-U3. JBB 9/27/90 HJE 9/27/90

WORK PROCEDURE

TK-U3 INTEGRITY ASSESSMENT WP-P-90-25 PAGE 4 OF 13

Oper.Init./date

d (cont) Fill TK-U3 until WFR-U3 levels out indicating overflow to TK-U4 and then stop transfer by closing valve:
U5-02 and Turn off JC-SUB sump jet. JPH 9/27/90 HPT 9/27/90
JQA/10-5-90

e. If necessary, repeat steps VI.B.1&2 above to get enough water in TK-U5 to finish filling TK-U3.

NOTE: Go to section VI.D and finish all steps now. Then return to continue with following step VI.B.4.

4. Transfer small amount of water to TK-D1 in order to detect leaks into tank.

JQA/10-5-90 a. Use JC-U3 to transfer water to TK-D1.
JQA/10-5-90 b. Observe pen on WFR-U3 and stop transfer when needle starts to move.
JQA/10-5-90 c. Check amount removed with the computer RUSKAS to determine that amount transfered lowered level no more than 2 inches. Adjust level if necessary by adding more water from TK-U5.

5. Obtain supervision signature and date when this step is complete. Obtain Quality Control signature, stamp, and date documenting completion of this step.

Sup.sig D A Mann date 10/5/90 Q.C.sig. J. E. Vaile date 10/5/90

C. ISOLATION

NOTE: The steps in this section may be performed in any order.

Oper.Init./date

1. ~~Turn~~ Ensure the following Jet controllers ~~to~~ are in "OFF" position: JPH 9/27/90 HPT 9/27/90

JQA/10-5-90 JC-SUB (SUMP-UB to TK-U3)
JQA/10-5-90 JC-U3 (TK-U3 to UGS)
JQA/10-5-90 JC-U4 (TK-U4 to UGS)

Tag each controller "CAUTION" and write "DO NOT OPERATE. TK-U3 INTEGRITY ASSESSMENT IN PROGRESS" on the tag. Obtain Quality Control signature, stamp, and date to verify completion of this step.

Quality Control J. E. Vaile date 10/5/90

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WORK PROCEDURE

Oper. Init./date

2. Close and CAUTION tag the following manual valves to shut off steam to above transfer jets:

~~U07-04~~ ~~(Steam supply to jet SUB to U3)~~ ~~APH 9/27/90~~ Do it on HR 9/27/90 U07-04 HR2 10/5 DONE
U08-04 (Steam supply to jet U4 to UGS)
U09-04 (Steam supply to jet U3 to UGS)

a. Write on CAUTION tag "DO NOT OPEN. TK-U3 INTEGRITY ASSESSMENT IN PROGRESS".
b. Check each of the above valves with leak detector. If leakage exists or is questionable, contact supervision. When no leakage can be detected initial and date. Obtain Quality Control signature, stamp and date to verify completion of this step.

Quality Control J.E. Vail date 10/5/90

3. Check the following Jet Gang Block Valve DOVs for leakage using the leak detector.

DOV-J-S-UB(Block)	UB Sump to U3
DOV-J-U3(Block)	U3 to UGS
DOV-J-U4(Block)	U4 to UGS

If leakage exists or is questionable, contact supervision. When no leakage can be detected initial and date. Obtain Quality Control signature, stamp and date to verify completion of this step.

Quality Control J.E. Vail date 10/5/90

4. CAUTION tag following switches to prevent tranfers to TK-U3.
a. Jet transfer of 216A sump to TK-U3:
VS-216 (Jet TK-2 to TK-U3, HECR)
b. Pump transfer of railroad tunnel sump to TK-U3:
MS-DR-1 (Pump P-P3 to TK-U3, CCR)
c. Write on CAUTION tags "DO NOT OPERATE. TK-U3 INTEGRITY ASSESSMENT IN PROGRESS". Obtain Quality Control signature, stamp and date to verify completion of this step.

Quality Control J.E. Vail date 10/5/90

5. Isolate TK-U3 by closing following valves:
a. In P&O gallery:

U-084-01	Head End Wash to TK-U3
U-085-01	NaOH to TK-U3
U-085-02	NaNO2 to TK-U3
U-096-03	NaNO2 to TK-U3

WORK PROCEDURE

TK-U3 INTEGRITY ASSESSMENT WP-P-90-25 PAGE 6 OF 13

b. In U Cell:

U3-07	Recovered HNO3 from TK-U6
U3-04	Lab Waste to TK-U3
U3-05	Lab Waste to TK-U3

c. ~~CAUTION tag valves and write on tags "DO NOT OPEN. TK U3 INTEGRITY ASSESSMENT IN PROGRESS".~~ HR 10/4 Date 10/5

Oper.Init./date

d. Check above valves for leaks with the leak detector. If leakage exists or is questionable, contact supervision. When no leakage can be detected initial and date. Obtain Quality Control signature, stamp and date to verify completion of this step. JPH 9/27/90 HR 9/27/90

Quality Control date

6. Reroute P&O gallery floor drains to Chemical Sewer.
   a. Notify supervision that floor drains in P&O gallery need to be diverted to Chemical Sewer.

NOTE TO SUPERVISION: All activities in P&O gallery that could cause a spill to the floor must be stopped to ensure that the Chemical Sewer does not send a chemical spill to the environment. IF A SPILL SHOULD OCCUR immediately reroute P&O gallery floor drains to TK-U3. We can always start the integrity test over if need be.

JL 10-5-90 b. Have operator in Dispatch Office switch the "EAST" section of P&O gallery to the Chemical Sewer.
   c. CAUTION tag switch and write "DO NOT OPERATE. TK-U3 INTEGRITY ASSESSMENT IN PROGRESS".
   d. Obtain Quality Control signature, stamp and date to verify completion of this step.

Quality Control J. E. Vaile date 10/5/90

7. Select TK-U4 with following DOV controllers in HECR:
   a. Route recovered acid, fractionator bldg. floor drains, and TK-U5 to TK-U4 with:
      VS-U3
   b. Route Lab Waste to TK-U4 with:
      VS-U4
   c. Tag each controller "CAUTION" and write on tag "DO NOT OPERATE. TK-U3 INTEGRITY ASSESSMENT IN PROGRESS".
   d. Obtain Quality Control signature, stamp and date to verify completion of this step.

HR2 10-5-90
JDD 10-5-90

Quality Control J. E. Vaile date 10/5/90

WORK PROCEDURE

D. PRE-ASSESSMENT PROCEDURE

NOTE: This section of procedure can be performed at anytime prior to assessement of tank. Steps 2, 3, and 4 in this section may be performed in any order.

1. Per WP #2A90-01349 the prover/scale platform should be set up to the west of instrument rack 16 in the P&O gallery. The computer/RUSKA cabinet should be set up between racks 14 and 16 in the P&O gallery.

2. Connect tank diptubes to assessment RUSKAs
   a. Have an HPT monitor this activity.
   b. Per WP #2A90-01349 have instrument technician make pneumatic connections between the calibration ports on WFT-U3 and SGT-U3 located on instrument rack 16 and the appropriate ports on the calibration computer/RUSKA cabinet.
   c. Have the instrument technician pressurize to 10 psi or greater and leak check and repair all leaking pneumatic connections on weight factor and specific gravity instrumentation.
   d. Obtain Quality Control signature, stamp, and date documenting completion of this step.

   Q.C.signature J.E. Vaile date 10/5/90

Oper.initial/date

KDD 10/5/90

3. Thermohm Connection
   a. Place a "CAUTION" tag on TR-U3 in HECR and write on the tag "OUT OF SERVICE. TK-U3 INTEGRITY ASSESSMENT IN PROGRESS".
   b. Per WP #2A90-01349 request an instrument technician make the tie-in to the line from TE-U3 located in HECR at CVT-U3.
   c. Connect cable to the Brown A Bulb amphenol connector on the prover platform NEMA box.
   d. Obtain supervision signature and date when this step is complete. Obtain Quality Control signature, stamp, and date documenting completion of this step.

   Q.C.signature J.E. Vaile date 10/5/90

WORK PROCEDURE

4. Electrical power

Oper. initial/date

JAO 10-5-90 a. Install "CAUTION" tag on circuit breaker switch LM-11 to ensure that power will not be removed from the computer and tank assessment instruments during the run. Write on tag "DO NOT TURN OFF. TK-U3 INTEGRITY ASSESSMENT IN PROGRESS".

b. Obtain Quality Control signature, stamp, and date documenting completion of this step.

Q.C.signature J.E. Vail date 10/5/90

5. Turn on system power switches
   a. Main power switch located in upper right corner on front of computer/RUSKA cabinet.
   b. The three RUSKA pressure transducers.
   c. Fluke translator
   d. HP 3421A Data Acquisition Control Unit
   e. Disk Drive for computer
   f. HP310 computer and monitor

6. Boot the Computer
   a. Turn "OFF" the HP3421A Data Acquisition and Control Unit.
   b. Obtain tank assessment "System" floppy disk from supervision or process engineer (H.R. Risenmay) and insert in drive "0" (left hand drive).
   c. Turn the computer power off and back on to restart computer. The computer will load the system file found on the system disk and then run the menu software.
   d. Turn "ON" the HP3421A Data Acquisition and Control Unit.
   e. Select "Datatest" from the menu by pressing the "7" key and the "Return" key. "Datatest" is also located on the "System" disk so no disk changes will be required.

7. Check out connections to computer
   a. "Datatest" starts by continually checking the RUSKA connectons and the Thermohm connections. There should be appropriate readings listed on screen for all of the above.
   b. The remaining portion of "Datatest" is not needed for this assessment. Press the "STOP" key on computer keyboard to discontinue program operation.

8. Remove the program disk from the disk drive. Leave power turned on to all assessment equipment. To obtain stable readings RUSKAs have to be powered up for at least 8 hours before assessment run can begin.

WORK PROCEDURE

9. Obtain supervision signature and date to indicate that the pre-assessment procedure is complete. Obtain Quality Control signature, stamp, and date documenting completion of this step.

Sup.sig. [signature] date 10/5/90 Q.C.sig. J.E. Vail date 10/5/90

E. TANK INTEGRITY ASSESSMENT

1. Insert floppy disk with "INTEGRITY" software into drive "0".

2. Insert floppy disk for data storage into drive "1".

3. On keyboard type LOAD "INTEGRITY" and press "RETURN".

4. Type RUN and press "RETURN".

5. Answer all questions printed on the computer CRT screen by typing in the response and pressing the "Return" key.
   a. Tank ID is "U3"
   b. Operator ID is your first two initials and last name.
   c. Tank volume is 8200 gallons.
   d. Run number is the year (90) plus a dash plus whichever run is being performed (1).
   e. Enter todays date.
   f. Enter cycle time of "30" minutes.
   g. Enter number of cycles to run as "40" or more.
   h. Software will now give you a chance to correct mistakes made in entering data. Follow directions on CRT screen.

6. Enter RTD type
   a. Input "3" for Brown A Bulb RTD.
   b. Software will now give you a chance to correct mistakes made in entering data. Follow directions on CRT screen.

7. Printer preparation
   a. The "ON" switch for the printer is found in the back right hand corner. Control panel lights will be lighted when printer is on.
   b. The "ON-LINE" red light should be lighted. Pressing the "ON-LINE" button will toggle the printer from "ON-LINE" to "OFF-LINE"(red light not lighted) and back.
   c. When printer is turned "ON" and "ON-LINE" press special function key "F5" for "CONTINUE" as shown on menu at bottom of CRT screen.

WORK PROCEDURE

8. Preparation of Floppy disk for data storage
   a. "INTEGRITY" disk should be in "0" drive (left hand) and "DATA" disk should be in "1" drive (right hand).
   b. When disks are correctly positioned press special function key "F5" for "CONTINUE" as shown on menu at bottom of CRT screen.
   c. Software will now prepare files on "DATA" disk for data storage. If there are any problems encounter by the software, directions will appear on CRT screen for how to correct them.

9. Set purge air rate
   a. Check purgerator air flow rate for the dip tubes in the HECR and adjust to "1.0" SCFH.
   b. When purge rate is correct press special function key "F5" for "CONTINUE" as shown on menu at bottom of CRT screen.

10. Adjust RUSKAs for zero reading.
   a. Per WP #2A90-01349 request an instrument technician to CLOSE the isolation valves associated with each dip tube on the instrument rack and VENT the three RUSKA pressure transducers to atmosphere by opening VENT valve on computer cabinet.
   b. Have instrument technician adjust RUSKA pressure transducers to zero reading as directed on CRT screen.
   c. When RUSKAs have been zeroed press special function key "F5" for "CONTINUE" as shown on menu at bottom of CRT screen.
   d. After the computer prints out the results record the initial (zero) readings for the long tube pressure transducer:

Initial (zero): -.0003

NOTE: The number on the print out will not match the digital readouts because the computer converts psi to cm. H2O. Be sure to observe the sign in front of the number on the digital readout. Record a "+" or "-" before the number as indicated.

   e. Per WP #2A90-01349 request an instrument technician to CLOSE the VENT valve opened above and OPEN the isolation valves closed above.

WORK PROCEDURE

11. Assessment run by computer.
    a. The tank calibrator is automated so that continual operator involvement is not required. The operator should observe the progress of the assessment until the first wait period starts.
    b. After the computer prints out the results record the initial (tank) readings for the long tube pressure transducer.

Initial (tank): 441.1591

    c. After the wait period starts the operator can make twice a shift checks for error messages on screen and to observe if the print out of data is progessing normally.

    d. If a problem occurs which the operator cannot handle, the Shift Supervisor and/or the Process Engineer should be consulted.

NOTE: If necessary contact:

NAME	WORK PHONE	HOME PHONE	PAX
H. Rees Risenmay	373-3179	932-4637	304

    e. After the computer prints out the results record the final (tank) readings for the long tube pressure transducer.

Final (tank): 440.7995

12. Final Vent readings
    a. At the completion of the tank assessment, as instructed by the computer on the CRT screen, per WP #2A90-01349 request an instrument technician to CLOSE the isolation valves associated with each dip tube on the instrument rack and VENT the three RUSKA pressure transducers to atmosphere by opening VENT valve on computer cabinet.
    b. After the computer prints out the results record the final (vent) readings for the long tube pressure transducer.

Final (vent): 0.0402

NOTE: Be sure to observe the sign in front of the number on the digital readout. Record a "+" or "-" before the number as indicated.

WORK PROCEDURE

TK-U3 INTEGRITY ASSESSMENT WP-P-90-25 PAGE 12 OF 13

13. Zero the RUSKAs
    a. Per WP #2A90-01349 request an instrument technician to zero the three RUSKAs.
    b. After the computer prints out the results record the final (zero) readings for the long tube pressure transducer.

Final (zero): 0.0000

NOTE: Be sure to observe the sign in front of the number on the digital readout. Record a "+" or "-" before the number as indicated.

    c. Per WP #2A90-01349 request an instrument technician to close the atmospheric VENT valve and open the isolation valves closed above.

14. Final tank readings
    a. After the computer prints out the results record the final tank (zeroed) readings for the long tube pressure transducer.

After zero (tank): 440.7249

15. Turn in Data
    a. When the assessment is finished turn in the System disk, INTEGITY disk, the DATA disk, the printer paper data, and the PUREX Tank Assessment Data Sheet to supervision.
    b. Process Engineering will process the data generated.

HOLD POINT: Have PUREX Regulatory Compliance personnel examine data printout before proceeding with next section of procedure.

O.K. L. P. Clay October 8, 1990 8:25

F. POST-ASSESSMENT PROCEDURE

1. Approval to Restore tank
    a. Obtain supervision signature and date approving the disconnection of the tank assessment equipment and restoration of tank.

Sup.sig. R. L Barr date 10-8-90

Oper.Init./date

NOTE: Steps 2, 3, 4, and 5 in this section may be performed in any order.

WORK PROCEDURE

TK-U3 INTEGRITY ASSESSMENT WP-P-90-25 PAGE 13 OF 13

2. Remove "CAUTION" tag on the circuit breaker switch or box installed in step VI.D.4.a.

Oper. Init./date 10/11/90

3. Per WP #2A90-01349 have instrument technician remove computer cable tie-in at CVT-U3 in HECR installed in step VI.D.3.b. Remove "CAUTION" tag from HECR on TR-U3.

RAM 10/11/90

4. Per WP #2A90-01349 have instrument technician remove the connections to the diptubes installed in step VI.D.2.b. Remove caution tag in HECR from WFR/SGR-U3.

RAM 10/11/90

5. Remove tags from all equipment installed in part VI.C steps 1-7. Have dispatch operator reroute East Floor Drains to TK-U3. Initial and date after completion of this step.

Done

6. Use JC-U3 to transfer water in TK-U3 to tank TK-D1. It will be necessary to move water in TK-D1 forward to TK-D2/E3/E5 as needed to make room for all the water in TK-U3. Use ordinary procedures used for these transfers.

7. Obtain supervision signature upon completion of restoration.

Sup.sig. [signature] date 10-11-90

NOTE TO SUPERVISION: Check to be sure P&O gallery floor drains have been returned to TK-U3. Do not close out CCO-90-048 until after assessment of TK-U4.

9114320.1304

HAZARD ANALYSIS CHECKLIST

DATE: 8/9/90 PROCEDURE: WP-P-90-25

SIGNATURE: H. Rees Reasoner Rev/Mod: A-6

I. SAFETY DOCUMENTS REVIEW	DOC. NO.	REVIEWED? YES	NO	N/A	IDENTIFIED HAZARDS OR SAFETY REQUIREMENTS RELEVANT TO PROCEDURE? (YES OR NO)
OSR'S		/			No
SAR/SAD		/			
SARP		/			
ALARA PLAN		/			
RWP'S		/			
CRITICALITY SPECS		/			
OPERATING SPECS		/			
HOOD POSTINGS				/	
OTHERS (LIST)				/	

II. TASKS	DESCRIPTION	PREVENTIVE MEASURE
A.	Leak Check Diptube	None
B.	Move Gaseous Water	
C.	Isolation	
D	Pre-Assessment	
~~E~~ E	Assessment	
~~F~~ F	Post-Assessment	

III. TASK HAZARD

CAN COMBINATION OF OPERATING CONDITIONS, OPERATOR ERROR OR EQUIPMENT MALFUNCTION RESULT IN ANY OF THE FOLLOWING?	TASK A	B	C	D	E
o FIRE OR EXPLOSION	N				
o CRITICALITY	N				
o RADIATION EXPOSURE	N				
o UNCONTROLLED CONTAMINATION SPREAD	N				
- RADIOACTIVE RELEASE THRU LIQUIDS, GASES, OR SOLIDS	N				
- TOXIC LIQUIDS, GASES, PARTICLES RELEASE	N				
o INJURY TO PERSONNEL (TO BE IDENTIFIED FURTHER IN PART IV)	N				
o DAMAGE TO EQUIPMENT OR FACILITY	N				
o SIGNIFICANTLY IMPAIRING THE PROCESS/PROGRAM WORK	N				
o DEGRADATION OR LOSS OF PRODUCT	N				
o OTHER (LIST)	N				

FIGURE 2 - PROCEDURE HAZARD ANALYSIS CHECKLIST

ALYSIS CHECKLIST

AL HAZARDS - IS THERE A CHANCE FOR : (circle specific items)

ict with material or equipment that
.tate, cut, abrade, poison, asphyxiate
otherwise injure them.

Task/Activity A B C D E

is, or material with sharp edges, corners, points,
ot to have slivers.

is, or instruments with potential for electric shock

urized, hot, molten; can squirt, bubble, splash,
minated.

material that can get hot by way of friction, steam,
ical resistance.

ritating or poisonous on contact, inhalation or
flammable or explosive; dangerous in quantity,
containers, when stored near reactive chemicals

emperature is not obvious.

that are monotonously repetitive, need special
e action, or special communication.

Task/Activity A B C D E

y or against something that can
e, scrape, cut, scratch, blind or
n.

tools that are hot, easily broken; apt to be
rts; apt to tip, fall or slip, glance.

are hot, molten or sharp; impelled by high speed
apped or chipped off, or carried by wind; easily
rssure.

nake bites.

with motions causing constant irritation.

n blowing dust or sand.

Task/Activity A B C D E

on, in, by or between objects that
pinch, trap, fracture, sever or

at can catch, jam or snag clothing; be operated
ontrolled from more than one point; be operated
tion, preparation, or approval; not properly locked

y or awkward to move, grip, or load; can fall,
ck; is brittle, under stress, apt to be improperly

ith danger of being trapped.

that cause instinctive reactions, excessive force;
rce applied toward body.

4. People to trip or fall.

Task/Activity A B C D E

-Walkways that are apt to be slick, wet, oily; are cluttered, rough, uneven, soft; have poor visibility, high traffic, steep gradients.

-Locations that have poor visibility, inadequate lighting, unsure footing or poor weather conditions; are above or below ground/floor level, or require a ladder, scaffold or access stairway; induce taking dangerous short-cuts.

-Action requirements that may cause slipping, falling, off balance or stumbling, misjudging distances.

5. People to overexert themselves so that they receive strains or sprains, faint, become ill or otherwise injure themselves - for example:

Task/Activity A B C D E

-Material, equipment, or tools that are heavy, awkward; apt to be improperly lifted or carried; need special equipment or twisting motion to move

-Locations with cramped quarters, inadequate air supply, or excessive heat and humidity

-Action requirements that cause strain in applying effort.

6. People to be exposed to excessive or inadequate heat, noise, air pressure, humidity, or light.

Task/Activity A B C D E

-Locations with confined quarters with danger of asphyxiation high heat or humidity

-Outside location exposed to high winds, extreme temperatures or rain.

7. Workers to be provided erroneous, inadequate or confusing data or instructions that could cause them to make errors.

Task/Activity A B C D E

-Instruments that are prone to malfunction or go out of calibration frequently or are difficult to read properly or often misread because of scale changes

-Hard to identify valves or other equipment

-Conditions that prevent ready access to procedures

-Poor communication facilities between co-workers or supervision.

HAZARD ANALYSIS CHECKLIST

V. FACILITY SPECIFIC HAZARDS - (to be prepared by responsible process engineer as required)

None

TABLE 1

PROBABILITY	CONSEQUENCES		
	NOT SIGNIFICANT	SIGNIFICANT	SEVERE
HIGHLY UNLIKELY	0	0	1
NOT LIKELY BUT CREDIBLE	0	1	2
GOOD CHANCE	1	2	3

TABLE 2

TYPE OF CONSEQEUENCE	NOT SIGNIFICANT	SIGNIFICANT	SEVERE
PERSONNEL INJURY	o FIRST AID ONLY	o TYPE B ACCIDENT INVESTIGATION o LOST TIME o HEARING IMPAIRMENT	o TYPE A ACCIDENT INVESTIGATION o DISABLING INJURY o LOSS OF LIFE
RADIOACTIVE EXPOSURE	o DOSE WITHIN WEEKLY LIMIT o CLOTHING, EQUIPMENT CONTAMINATION, NO SKIN CONTAMINATION	o DOSE RATE ABOVE WEEKLY LIMIT, BELOW ANNUAL LIMIT o SKIN CONTAMINATION o CONTAMINATED INJURY	o SINGLE EXPOSURE OVER ANNUAL LIMITS o VISITOR RADIATION EXPOSURE ABOVE LIMITS o DETECTABLE INTERNAL DEPOSITIONS
EQUIPMENT/FACILITY DAMAGE	< $1000 TO REPAIR	$1000 - $50,000 DOE TYPE C INVESTIGATION	> $50,000 DOE TYPE A OR B INVESTIGATION
PROCESS/PRODUCT DEGRADATION	WASTE AND PRODUCT REMAINS WITHIN SPECS	REWORK NEEDED	EXTENSIVE PROGRAMMATIC IMPACT
DAMAGE TO ENVIRONMENT	RELEASES REMAIN WITHIN PLANT STANDARDS	NON-ROUTINE RADIOACTIVE RELEASE QUALIFYING AS POTENTIAL UNUSUAL OCCURENCE (SEE RHO-MA-139, PART B, NON-RAD RELEASE ABOVE STANDARDS IN PARTS C & E)	ABOVE DOE STANDARDS FOR TYPE A OR B INVESTIGATIONS
CONTINUITY OF OPERATION	PARTIAL, TEMPORARY SHUTDOWN WITH INSIGNIFICANT PROGRAMMATIC IMPACT	TEMPORARY SHUTDOWN MINOR PROGRAM IMPACT	EXTENSIVE PROGRAM DELAY
MISCELLANEOUS		FIRE/EXPLOSION OCCURENCE LIKELY TO HAVE PUBLIC OR PRESS INQUIRY OR PRESS RELEASE	CRITICALITY INCIDENT

APPENDIX C
TK-U4 WORK PROCEDURE

DOCUMENT ACCEPTANCE REVIEW FORM

Page _____ of _____

DOCUMENT

Impact Level: 3

Type: Work Procedure | No.: WP-F-90-26 | Rev./Mod.: A-0

Title: TK-U4 Integrity Assessment

Prepared By

Name: H. R. Risenmay

Title/Organization: Sr. Eng. / P.P.E.

- [x] New or Revised Document – Full Review Required
- [ ] Modification – Changed Pages _____

- [x] Full Review Required
- [ ] Review Limited to Change Pages/No Preliminary Review Required
- [ ] Administrative Change –
- [ ] PCA – Approved Changes Only –

} No Review and Approval required except for the approval authority's.

PCAs and DCRs	
Incorporated	Not Incorporated
	Cancel
	1
	2 Reissue
	1
	2

Work Station Copy Distribution

Changes to Information Copy Distribution

ADVICE AND SERVICE MEMBER SIGNATURES

DOCUMENT IS ACCEPTABLE As Is	ACCEPTABLE With Changes Noted	NOT ACCEPTABLE Objections on Continuation or Attached	(Signature)	(Title/Org.)	(Date)
[x]	[ ]	[ ]	H. Ross Risenmay	Sr. Eng / PPE	8/10/90
[ ]	[x]	[ ]	[illegible]	Sr Eng / PAR	8/10/90
[x]	[ ]	[ ]	[illegible]	[illegible]	8-10-90
[ ]	[x]	[ ]	[illegible]	PUREX QUALITY ASSURANCE	8/17/90
[ ]	[x]	[ ]	[illegible]	Sr Eng / Purex Engineering	8/21/90
[ ]	[x]	[ ]	R. L. Bauer	Purex Processing Group Supervisor	8/22/90
[ ]	[ ]	[ ]			

ACCEPTANCE REVIEW CHAIRMAN

(Signature) | (Title/Org.) | (Date)

ACCEPTANCE REVIEW CHAIRMAN

- [x] All objections resolved
- [ ] Unresolved issue exists

[illegible] | MGR PUREX PROCESS OPS | 8/28/90

(Signature) | (Title/Org.) | (Date)

WORK PROCEDURE

TK-U4 INTEGRITY ASSESSMENT WP-P-90-26 PAGE 1 OF 12

I. SYSTEM DESCRIPTION

This work plan provides instructions for performing isolation of tank, connection of RUSKA equipment, tank integrity assessment, and restoration of tank for normal service.

All tanks to be assessed must be isolated to obtain a reliable assessment. It must be ensured that there are no leaks into or out of the tank and that evaporation or condensation is minimized during the time of the assessment.

The tank calibrator is connected to the tank diptubes in preparation for the assessment.

The tank assessment establishes that the tank liquid level does not change over the time the run is made which indicates that the tank does not leak. The tank assessment system consists of a computer automated system that determine the temperature of the process tank and the weight factor and specific gravity readings of the dip tubes of the process tank.

One assessment run will last 24 hours or more. The data collected during the assessment run will be printed on paper and stored on a floppy disk. This data will be statistically analyzed to determine if any leaks occured during the run.

After completion of the integrity assessment the tank calibrator is disconnected and the tank is restored for normal operations.

The tank calibrator can be hooked up to the diptubes at anytime before the assessment starts. The connection of the tank calibrator does not impair the use of the HECR instruments used to make the transfers into the tank. The different steps in the isolation and connection of the calibration equipment can be performed in any order.

II. PRESTART CONDITIONS

Canyon Change Order CCO-90-048 must be in place to move water in TK-G7 to TK-F3. Water will then follow ordinary route to TK-U5 and from TK-U5 by gravity drain to TK-U4. The route from TK-U3/U4 to UGS must be rerouted to TK-D1 to empty the tank after the assessment.

WORK PROCEDURE

III. SAFETY .

None of the equipment involved with the assessment run will be set up in a radiation zone but several valves are located in U cell that have to be closed. The provisions of General Regulations and Practices for Radiation Zone Work, GEN-0 and Radiation Work Procedures A-10 and A-15 shall apply to all work performed under this work plan.

IV. TOOLS, EQUIPMENT AND SUPPLIES

A. LEAK CHECK DIPTUBES
1. Craftsmen will supply their own tools.

B. MOVE ASSESSMENT WATER TO TK-U4
1. None.

C. Isolation.
1. Mechanics Stethoscope (leak detector).

D. Pre-Assessment procedure.
1. Craftsmen will supply their own tools.
2. Computer software floppy disk containing DATATEST.
3. PUREX Tank Calibration System.

E. Tank Integrity Assessment.
1. PUREX Tank Calibration System
2. Computer software floppy disk containing INTEGRITY.
3. At least 1 inch stack of printer paper.
4. Computer floppy disk for data storage.

F. Post-Assessment procedure.
1. Craftsmen will supply their own tools.

V. TABLE OF CONTENTS

WORK PROCEDURE

VI. PROCEDURE

A. LEAK CHECK DIPTUBES

1. Have an HPT monitor this activity.

Oper.Init./date

RAM 10/12/90 Place a "CAUTION" tag on WFR-U4 and SGR-U4 in HECR and write on the tag "TK-U4 INTEGRITY ASSESSMENT IN PROGRESS".

3. Have the instrument technician pressurize to 10 psi or greater and leak check and repair all leaking pneumatic connections on weight factor and specific gravity instrumentation. If the pneumatic tubing is in bad condition on the instrument rack replace with new tubing and fittings as needed.

NOTE TO PLANNING: New tubing and fittings should be ordered as needed to refurbish the connections on the instrument rack.

B. MOVE ASSESSMENT WATER TO TK-U4.

Oper.Init./date

1. Move water in TK-G7 to TK-F3.
   a. Ensure that TK-G7 to TK-F3 route is in place.
RAM 10/11/90 b. Turn on pump P-G7-2 with MS-G7-2 to move water in TK-G7 to TK-F3. (Rerouted by CCO-90-048)
RAM 10/11/90 c. Observe rise in TK-F3 on WFR-F3 and turn off pump P-G7-2 when weight factor reaches 68%.

2. Move water in TK-F3 to TK-U5.
   a. Close following valves in U cell:
RAM 10/11/90 U1-05
RAM 10/11/90 U2-06
RAM 10/11/90 U2-22
   b. Open following valve in U cell:
RAM 10/11/90 U2-21
RAM 10/11/90 c. Turn on pump P-F3 with MS-F3-2 and run until WFAS-F3-4 turns off pump.

3. Move water in TK-U5 to TK-U4.
   a. Set VS-U3 to U4 position to route water to TK-U4.
   b. Close following valves in U cell:
RAM 10/11/90 U5-03 Inlet to pump P-U5-1
RAM 10/11/90 U5-05 Inlet to pump P-U5-2
   c. Open following valves in U cell:
RAM 10/11/90 U5-01 TK-U5 outlet valve
RAM 10/11/90 U5-02 Gravity drain to ~~TK-U4~~ SU13 Sump.

10-10-90
RB HR 10/10

WORK PROCEDURE

Oper.Init./date

d. Fill TK-U4 using JC-54B To TK U3 And overflowing To U4 until WFR-U4 levels out ~~indicating overflow~~ with U4. ~~to TK-U3 and~~ then stop transfer by closing valve: U5-02

RAM 10/4/90 10-10-90

e. If necessary, repeat steps VI.B.1&2 above to get enough water in TK-U5 to finish filling TK-U4. HR 10/10

NOTE: Go to section VI.D and finish all steps now. Then return to continue with following step VI.B.4.

4. Transfer small amount of water to TK-D1 in order to be able to detect leaks into tank.

RAM 10/4/90 a. Use JC-U4 to transfer water to TK-D1.

RAM 10/4/90 b. Observe pen on WFR-U4 and stop transfer when needle starts to move.

RAM 10/4/90 c. Check amount removed with the computer RUSKAS to determine that amount transfered lowered level no more than 2 inches. Adjust level if necessary by adding more water from TK-U5.

5. Obtain supervision signature and date when this step is complete. Obtain Quality Control signature, stamp, and date documenting completion of this step.

Sup.sig. RBaur date 10-11-90 Q.C.sig. J.E. Vail (WHC 97 APPROVED) date 10/11/90

C. ISOLATION

NOTE: The steps in this section may be performed in any order.

Oper.Init./date

1. Turn the following Jet controllers to "OFF" position:

RAM 10/11/90 JC-U3 (Rerouted to TK-U4)
RAM 10/11/90 JC-U4 (TK-U4 to UGS)
RAM 10/4/90 JC-SUA-3 (SUMP-UA to TK-U4)

Tag each controller "CAUTION" and write "DO NOT OPERATE. TK-U4 INTEGRITY ASSESSMENT IN PROGRESS" on the tag. Obtain Quality Control signature, stamp, and date to verify completion of this step.

Quality Control J.E. Vail (WHC 97 APPROVED) date 10/11/90

2. Close and CAUTION tag the following manual valves to shut off steam to above transfer jets:

RAM 10/4/90 U08-04 (Steam supply to jet U4 to UGS)
RAM 10/11/90 U09-04 (Steam supply to jet U3 to UGS)

WORK PROCEDURE

TK-U4 INTEGRITY ASSESSMENT WP-P-90-26 PAGE 5 OF 12

RAM 10/11/90 U11-04 (Steam supply to jet SUA to U4)

a. Write on CAUTION tag "DO NOT OPEN. TK-U4 INTEGRITY ASSESSMENT IN PROGRESS".
b. Check each of the above valves with leak detector. If leakage exists or is questionable, contact supervision. When no leakage can be detected initial and date. Obtain Quality Control signature, stamp and date to verify completion of this step.

Quality Control J.E. Vail date 10/11/90

Oper.Init./date

3. Check the following Jet Gang Block Valve DOVs for leakage using the leak detector.

RAM 10/11/90	DOV-J-U3(Block)	U3 to UGS
RAM 10/11/90	DOV-J-U4(Block)	U4 to UGS
RAM 10/11/90	DOV-J-S-UA(Block)	UA Sump to U4

If leakage exists or is questionable, contact supervision. When no leakage can be detected initial and date. Obtain Quality Control signature, stamp and date to verify completion of this step.

Quality Control J.E. Vail date 10/11/90

4. Isolate TK-U4 by closing following valves:
   a. In P&O gallery:

U-096-01	NaOH to TK-U4
U-096-02	NaNO2 to TK-U4
U-096-03	NaNO2 to TK-U4
U-097-01	Head End Wash to TK-U4

   b. In U Cell:

U3-07	Recovered HNO3 from TK-U6
U4-01	Acid from 203 area to TK-U4
U4-03	Lab Waste to TK-U4
U4-04	Lab Waste to TK-U4

HR 10/11/90 PMB 10/11/90

   c. CAUTION tag valves and write on tags "DO NOT OPERATE. TK-U4 INTEGRITY ASSESSMENT IN PROGRESS".
   d. Check above valves for leaks with the leak detector. If leakage exists or is questionable, contact supervision. When no leakage can be detected initial and date. Obtain Quality Control signature, stamp and date to verify completion of this step.

Quality Control J.E. Vail date 10/11/90

5. Select TK-U3 with following DOV controllers:
   a. Route recovered acid, fractionator bldg. floor drains, and TK-U5 to TK-U3 with:

WORK PROCEDURE

VS-U3
b. Route Lab Waste to TK-U3 with:
VS-U4
c. Tag each controller "CAUTION" and write on tag "DO NOT OPERATE. TK-U4 INTEGRITY ASSESSMENT IN PROGRESS".
d. Obtain Quality Control signature, stamp and date to verify completion of this step.

Quality Control J. E. Vaile (WHC 97 QCIC) date 10/11/90

D. PRE-ASSESSMENT PROCEDURE

NOTE: This section of procedure can be performed at anytime prior to assessement of tank. Steps 2, 3, and 4 in this section may be performed in any order.

1. Per WP #2A90-01350 the prover/scale platform should be set up to the west of instrument rack 16 in the P&O gallery. The computer/RUSKA cabinet should be set up between racks 14 and 16 in the P&O gallery.

2. Connect tank diptubes to assessment RUSKAs
   a. Have an HPT monitor this activity.
   b. Per WP #2A90-01350 have instrument technician make pneumatic connections between the calibration ports on WFT-U4 and SGT-U4 located on instrument rack 16 and the appropriate ports on the calibration computer/RUSKA cabinet.
   c. Have the instrument technician pressurize to 10 psi or greater and leak check and repair all leaking pneumatic connections on weight factor and specific gravity instrumentation.
   d. Obtain Quality Control signature, stamp, and date documenting completion of this step.

Q.C.signature J. E. Vaile (DBTO 16 QUALITY) Date 10/11/90

Oper.initial/date

3. Thermohm Connection

RAM 10/11/90
   a. Place a "CAUTION" tag on TR-U4 in HECR and write on the tag "OUT OF SERVICE. TK-U4 INTEGRITY ASSESSMENT IN PROGRESS".
   b. Per WP #2A90-01350 request an instrument technician make the tie-in to the line from TE-U4 located in HECR at CVT-U4.
   c. Connect cable to the Brown A Bulb amphenol connector on the prover platform NEMA box.
   d. Obtain supervision signature and date when this step is complete. Obtain Quality Control signature, stamp, and

date documenting completion of this step.

Q.C.signature J.E. Vail date 10/11/90

4. Electrical power

Oper.initial/date
RAM 10/11/90

Install "CAUTION" tag on circuit breaker switch LM-11 to ensure that power will not be removed from the computer and tank assessment instruments during the run. Write on tag "DO NOT TURN OFF. TK-U4 INTEGRITY ASSESSMENT IN PROGRESS".

b. Obtain Quality Control signature, stamp, and date documenting completion of this step.

Q.C.signature J.E. Vail date 10/11/90

5. Turn on system power switches
   a. Main power switch located in upper right corner on front of computer/RUSKA cabinet.
   b. The three RUSKA pressure transducers.
   c. Fluke translator
   d. HP 3421A Data Acquisition Control Unit
   e. Disk Drive for computer
   f. HP310 computer and monitor

6. Boot the Computer
   a. Turn "OFF" the HP3421A Data Acquisition and Control Unit.
   b. Obtain tank assessment "System" floppy disk from supervision or process engineer (H.R. Risenmay) and insert in drive "0" (left hand drive).
   c. Turn the computer power off and back on to restart computer. The computer will load the system file found on the system disk and then run the menu software.
   d. Turn "ON" the HP3421A Data Acquisition and Control Unit.
   e. Select "Datatest" from the menu by pressing the "7" key and the "Return" key. "Datatest" is also located on the "System" disk so no disk changes will be required.

7. Check out connections to computer
   a. "Datatest" starts by continually checking the RUSKA connectons and the Thermohm connections. There should be appropriate readings listed on screen for all of the above.
   b. The remaining portion of "Datatest" is not needed for this assessment. Press the "STOP" key on computer keyboard to discontinue program operation.

8. Remove the program disk from the disk drive. Leave power turned on to all assessment equipment. To obtain stable

WORK PROCEDURE

readings RUSKAs have to be powered up for at least 8 hours before assessment run can begin.

9. Obtain supervision signature and date to indicate that the pre-assessment procedure is complete. Obtain Quality Control signature, stamp, and date documenting completion of this step.

Sup.sig. R. L Bay date 10/11/90 Q.C.sig. J. E. Vail date 10/11/90

E. TANK INTEGRITY ASSESSMENT

1. Insert floppy disk with "INTEGRITY" software into drive "0".

2. Insert floppy disk for data storage into drive "1".

3. On keyboard type LOAD "INTEGRITY" and press "RETURN".

4. Type RUN and press "RETURN".

5. Answer all questions printed on the computer CRT screen by typing in the response and pressing the "Return" key.
   a. Tank ID is "U4"
   b. Operator ID is your first two initials and last name.
   c. Tank volume is 8200 gallons.
   d. Run number is the year (90) plus a dash plus whichever run is being performed (1).
   e. Enter todays date.
   f. Enter cycle time of "30" minutes.
   g. Enter number of cycles to run as "40" or more.
   h. Software will now give you a chance to correct mistakes made in entering data. Follow directions on CRT screen.

6. Enter RTD type
   a. Input "3" for Brown A Bulb RTD.
   b. Software will now give you a chance to correct mistakes made in entering data. Follow directions on CRT screen.

7. Printer preparation
   a. The "ON" switch for the printer is found in the back right hand corner. Control panel lights will be lighted when printer is on.
   b. The "ON-LINE" red light should be lighted. Pressing the "ON-LINE" button will toggle the printer from "ON-LINE" to "OFF-LINE"(red light not lighted) and back.
   c. When printer is turned "ON" and "ON-LINE" press special function key "F5" for "CONTINUE" as shown on menu at bottom of CRT screen.

WORK PROCEDURE

8. Preparation of Floppy disk for data storage
   a. "INTEGRITY" disk should be in "0" drive (left hand) and "DATA" disk should be in "1" drive (right hand).
   b. When disks are correctly positioned press special function key "F5" for "CONTINUE" as shown on menu at bottom of CRT screen.
   c. Software will now prepare files on "DATA" disk for data storage. If there are any problems encounter by the software, directions will appear on CRT screen for how to correct them.

9. Set purge air rate
   a. Check purgerator air flow rate for the dip tubes in the HECR and adjust to "1.0" SCFH.
   b. When purge rate is correct press special function key "F5" for "CONTINUE" as shown on menu at bottom of CRT screen.

10. Adjust RUSKAs for zero reading.
   a. Per WP #2A90-01350 request an instrument technician to CLOSE the isolation valves associated with each dip tube on the instrument rack and VENT the three RUSKA pressure transducers to atmosphere by opening VENT valve on computer cabinet.
   b. Have instrument technician adjust RUSKA pressure transducers to zero reading as directed on CRT screen.
   c. When RUSKAs have been zeroed press special function key "F5" for "CONTINUE" as shown on menu at bottom of CRT screen.
   d. After the computer prints out the results record the initial (zero) readings for the long tube pressure transducer:

Initial (zero): −0.0003

NOTE: The number on the print out will not match the digital readouts because the computer converts psi to cm. H2O. Be sure to observe the sign in front of the number on the digital readout. Record a "+" or "-" before the number as indicated.

   e. Per WP #2A90-01350 request an instrument technician to CLOSE the VENT valve opened above and OPEN the isolation valves closed above.

11. Assessment run by computer.
   a. The tank calibrator is automated so that continual operator involvement is not required. The operator should observe the progress of the assessment until the first wait period starts.

WORK PROCEDURE

b. After the computer prints out the results record the initial (tank) readings for the long tube pressure transducer.

Initial (tank): 444.5089

c. After the wait period starts the operator can make twice a shift checks for error messages on screen and to observe if the print out of data is progessing normally.

d. If a problem occurs which the operator cannot handle, the Shift Supervisor and/or the Process Engineer should be consulted.

NOTE: If necessary contact:

NAME	WORK PHONE	HOME PHONE	PAX
H. Rees Risenmay	373-3179	932-4637	304

e. After the computer prints out the results record the final (tank) readings for the long tube pressure transducer.

Final (tank): 444.6497

12. Final Vent readings
    a. At the completion of the tank assessment, as instructed by the computer on the CRT screen, per WP #2A90-01350 request an instrument technician to CLOSE the isolation valves associated with each dip tube on the instrument rack and VENT the three RUSKA pressure transducers to atmosphere by opening VENT valve on computer cabinet.
    b. After the computer prints out the results record the final (vent) readings for the long tube pressure transducer.

Final (vent): 0.0272

NOTE: Be sure to observe the sign in front of the number on the digital readout. Record a "+" or "-" before the number as indicated.

13. Zero the RUSKAs
    a. Per WP #2A90-01350 request an instrument technician to zero the three RUSKAs.
    b. After the computer prints out the results record the final (zero) readings for the long tube pressure transducer.

WORK PROCEDURE

TK-U4 INTEGRITY ASSESSMENT WP-P-90-26 PAGE 11 OF 12

Final (zero): 0.0000

NOTE: Be sure to observe the sign in front of the number on the digital readout. Record a "+" or "-" before the number as indicated.

c. Per WP #2A90-01350 request an instrument technician to close the atmospheric VENT valve and open the isolation valves closed above.

14. Final tank readings
a. After the computer prints out the results record the final tank (zeroed) readings for the long tube pressure transducer.

After zero (tank): 444.5999

15. Turn in Data
a. When the assessment is finished turn in the System disk, INTEGITY disk, the DATA disk, the printer paper data, and the PUREX Tank Assessment Data Sheet to supervision.
b. Process Engineering will process the data generated.

HOLD POINT: Have PUREX Regulatory Compliance personnel examine data printout before proceeding with next section of procedure.

O.K. T. E. Clay PUREX Reg. Compliance Date 10/15/90

F. POST-ASSESSMENT PROCEDURE
1. Approval to Restore tank
a. Obtain supervision signature and date approving the disconnection of the tank assessment equipment and restoration of tank.

Sup.sig. G. Lupperus date 10/15/90

Oper.Init./date

NOTE: Steps 2, 3, 4, and 5 in this section may be performed in any order.

HR 10/15/90 2. Remove "CAUTION" tag on the circuit breaker switch or box installed in step VI.D.4.a.

HR 10/15/90 3. Per WP #2A90-01349 have instrument technician remove computer cable tie-in at CVT-U4 in HECR installed in step VI.D.3.b. Remove "CAUTION" tag from HECR on TR-U4.

9112276-1429

WORK PROCEDURE

HR 10/15/90 4. Per WP #2A90-01350 have instrument technician remove the connections to the diptubes installed in step VI.D.2.b. Remove caution tag in HECR from WFR/SGR-U4.

HR 10/15/90 5. Remove tags from all equipment installed in part VI.C steps 1-5. Initial and date after completion of this step.

HR 10/15/90 6. Use JC-U4 to transfer water in TK-U4 to tank TK-D1. It will be necessary to move water in TK-D1 forward to TK-D2/E3/E5 as needed to make room for all the water in TK-U4. Use ordinary procedures used for these transfers.

7. Obtain supervision signature upon completion of restoration.

Sup.sig. C.H. May date 11/14/91

NOTE TO SUPERVISION: Route installed to transfer water from TK-G7 to TK-F3 and from TK-U3/U4 to TK-D1 by CCO-90-048 can now be removed and restored to original configuration.

HAZARD ANALYSIS CHECKLIST

DATE: 8/10/90 PROCEDURE: WP-P-90-26

SIGNATURE: H. Rees Riseman Rev/Mod: A-0

I. SAFETY DOCUMENTS REVIEW	DOC. NO.	REVIEWED? YES	NO	N/A	IDENTIFIED HAZARDS OR SAFETY REQUIREMENTS RELEVANT TO PROCEDURE? (YES OR NO)
OSR'S		✓			No
SAR/SAD		✓			
SARP		✓			
ALARA PLAN		✓			
RWP'S		✓			
CRITICALITY SPECS		✓			
OPERATING SPECS		✓			
HOOD POSTINGS				✓	
OTHERS (LIST)				✓	

II. TASKS	DESCRIPTION	PREVENTIVE MEASURE
A.	Leak Check Diptubes	None
B.	Move Water to TK-44	
C. D	Isolation Pre-Assessment	
E	Assessment	
F	Post-Assessment	

III. TASK HAZARD	TASK A	B	C	D	E
CAN COMBINATION OF OPERATING CONDITIONS, OPERATOR ERROR OR EQUIPMENT MALFUNCTION RESULT IN ANY OF THE FOLLOWING?					
o FIRE OR EXPLOSION	N				
o CRITICALITY	N				
o RADIATION EXPOSURE	N				
o UNCONTROLLED CONTAMINATION SPREAD	N				
- RADIOACTIVE RELEASE THRU LIQUIDS, GASES, OR SOLIDS	N				
- TOXIC LIQUIDS, GASES, PARTICLES RELEASE	N				
o INJURY TO PERSONNEL (TO BE IDENTIFIED FURTHER IN PART IV)	N				
o DAMAGE TO EQUIPMENT OR FACILITY	N				
o SIGNIFICANTLY IMPAIRING THE PROCESS/PROGRAM WORK	N				
o DEGRADATION OR LOSS OF PRODUCT	N				
o OTHER (LIST)	N				

FIGURE 2 - PROCEDURE HAZARD ANALYSIS CHECKLIST

HAZARD ANALYSIS CHECKLIST

IV. INDUSTRIAL HAZARDS - IS THERE A CHANCE FOR : (circle specific items)

1. People to make contact with material or equipment that can burn, corrode, irritate, cut, abrade, poison, asphyxiate, electrocute, drown or otherwise injure them.

Task/Activity A B C D E N

-Equipment, hand tools, or material with sharp edges, corners, points, or rough surfaces; apt to have slivers.

-Equipment, hand tools, or instruments with potential for electric shock or arcing.

-Material that is pressurized, hot, molten; can squirt, bubble, splash, or be burped; contaminated.

-Equipment, tools, or material that can get hot by way of friction, steam, open flame, or electrical resistance.

-Chemicals that are irritating or poisonous on contact, inhalation or ingestion; corrosive, flammable or explosive; dangerous in quantity, in improper storage containers, when stored near reactive chemicals or when disposed of.

-Hot material whose temperature is not obvious.

-Action requirements that are monotonously repetitive, need special attention, cooperative action, or special communication.

2. People to be struck by or against something that can bruise, crush, puncture, scrape, cut, scratch, blind or otherwise wound them.

Task/Activity A B C D E N

-Equipment and hand tools that are hot, easily broken; apt to be faulty, have loose parts; apt to tip, fall or slip, glance.

-Flying particles that are hot, molten or sharp; impelled by high speed equipment, being snapped or chipped off, or carried by wind; easily dislodged or under prssure.

-Potential insect or snake bites.

-Action requirements with motions causing constant irritation.

-Outside locations with blowing dust or sand.

3. People to be caught on, in, by or between objects that can crush, puncture, pinch, trap, fracture, sever or otherwise injure them.

Task/Activity A B C D E N

-Moving machinery that can catch, jam or snag clothing; be operated unintentionally, be controlled from more than one point; be operated without prior inspection, preparation, or approval; not properly locked or tagged.

-Material that is heavy or awkward to move, grip, or load; can fall, roll, tip, slide, get stuck; is brittle, under stress, apt to be improperly carried or lifted.

-Confined quarters with danger of being trapped.

-Action requirements that cause instinctive reactions, excessive force; sudden actions or force applied toward body.

4. People to trip or fall.

Task/Activity A B C D E N

-Walkways that are apt to be slick, wet, oily; are cluttered, rough, uneven, soft; have poor visibility, high traffic, steep gradients.

-Locations that have poor visibility, inadequate lighting, unsure footing or poor weather conditions; are above or below ground/floor level, or require a ladder, scaffold or access stairway; induce taking dangerous short-cuts.

-Action requirements that may cause slipping, falling, off balance or stumbling, misjudging distances.

5. People to overexert themselves so that they receive strains or sprains, faint, become ill or otherwise injure themselves - for example:

Task/Activity A B C D E N

-Material, equipment, or tools that are heavy, awkward; apt to be improperly lifted or carried; need special equipment or twisting motion to move

-Locations with cramped quarters, inadequate air supply, or excessive heat and humidity

-Action requirements that cause strain in applying effort.

6. People to be exposed to excessive or inadequate heat, noise, air pressure, humidity, or light.

Task/Activity A B C D E N

-Locations with confined quarters with danger of asphyxiation high heat or humidity

-Outside location exposed to high winds, extreme temperatures or rain.

7. Workers to be provided erroneous, inadequate or confusing data or instructions that could cause them to make errors.

Task/Activity A B C D E N

-Instruments that are prone to malfunction or go out of calibration frequently or are difficult to read properly or often misread because of scale changes

-Hard to identify valves or other equipment

-Conditions that prevent ready access to procedures

-Poor communication facilities between co-workers or supervision.

None

FIGURE 2 - PROCEDURE HAZARD ANALYSIS CHECKLIST (Cont.)

PROBABILITY	CONSEQUENCES		
	NOT SIGNIFICANT	SIGNIFICANT	SEVERE
HIGHLY UNLIKELY	0	0	1
NOT LIKELY BUT CREDIBLE	0	1	2
GOOD CHANCE	1	2	3

TABLE 2

TYPE OF CONSEQEUENCE	NOT SIGNIFICANT	SIGNIFICANT	SEVERE
PERSONNEL INJURY	o FIRST AID ONLY	o TYPE B ACCIDENT INVESTIGATION o LOST TIME o HEARING IMPAIRMENT	o TYPE A ACCIDENT INVESTIGATION o DISABLING INJURY o LOSS OF LIFE
RADIOACTIVE EXPOSURE	o DOSE WITHIN WEEKLY LIMIT o CLOTHING, EQUIPMENT CONTAMINATION, NO SKIN CONTAMINATION	o DOSE RATE ABOVE WEEKLY LIMIT, BELOW ANNUAL LIMIT o SKIN CONTAMINATION o CONTAMINATED INJURY	o SINGLE EXPOSURE OVER ANNUAL LIMITS o VISITOR RADIATION EXPOSURE ABOVE LIMITS o DETECTABLE INTERNAL DEPOSITIONS
EQUIPMENT/FACILITY DAMAGE	< $1000 TO REPAIR	$1000 - $50,000 DOE TYPE C INVESTIGATION	> $50,000 DOE TYPE A OR B INVESTIGATION
PROCESS/PRODUCT DEGRADATION	WASTE AND PRODUCT REMAINS WITHIN SPECS	REWORK NEEDED	EXTENSIVE PROGRAMMATIC IMPACT
DAMAGE TO ENVIRONMENT	RELEASES REMAIN WITHIN PLANT STANDARDS	NON-ROUTINE RADIOACTIVE RELEASE QUALIFYING AS POTENTIAL UNUSUAL OCCURENCE (SEE RHO-MA-139, PART B, NON-RAD RELEASE ABOVE STANDARDS IN PARTS C & E)	ABOVE DOE STANDARDS FOR TYPE A OR B INVESTIGATIONS
CONTINUITY OF OPERATION	PARTIAL, TEMPORARY. SHUTDOWN WITH INSIGNIFICANT PROGRAMMATIC IMPACT	TEMPORARY SHUTDOWN MINOR PROGRAM IMPACT	EXTENSIVE PROGRAM DELAY
MISCELLANEOUS		FIRE/EXPLOSION OCCURENCE LIKELY TO HAVE PUBLIC OR PRESS INQUIRY OR PRESS RELEASE	CRITICALITY INCIDENT

APPENDIX D
LEAK TEST QUALITY CONTROL DOCUMENT FOR TK-F18

LEAK TEST
DANGEROUS WASTE TANKS

TANK NO. F/8

Work Plan No. WP-P-90-11
Test Date 5/19/90-5/19/90

TEST CRITERIA

- Leak Detection Method: Bubble tube with RUSKA electromanometer
- Tank water level: Below reference tube not more than 2 inches
- Minimum water level hold time: 14 hours
- Data required: Test times, H2O temperature, H2O level, variance of each data value
- Data interval: minimum of 8 printed records evenly spaced over test
- Maximum water level fluctuation: 0.46 cm
- Instrument sensitivity (maximum variance): 100 (1.0 cm^2 X 100)

MANDATORY QUALITY CONTROL HOLD POINTS

- Tank isolation and leak checks completed.
- Pre-calibration and/or assessment steps completed.
- Specified water level set for integrity assessment.

J. E. Vaile WHC 97 4/100
Quality Control

8/27/90
Date

TEST DEVIATIONS

None

TEST RESULTS

The test criteria have been met, except as noted, under test deviations.

Laurence E. Clay
PUREX Regulatory Compliance

8/27/90
Date

APPENDIX E
LEAK TEST QUALITY CONTROL DOCUMENT FOR TK-U3

LEAK TEST
DANGEROUS WASTE TANKS

TANK NO. U3

Work Plan No. WP-P-90-25
Test Date 9/5/90 to 10/8/90

TEST CRITERIA

- Leak Detection Method: Bubble tube with RUSKA electromanometer
- Tank water level: Below reference tube not more than 2 inches
- Minimum water level hold time: 14 hours
- Data required: Test times, H2O temperature, H2O level, variance of each data value
- Data interval: Minimum of 8 printed records evenly spaced over test
- Maximum water level fluctuation: 0.46 cm
- Instrument sensitivity (maximum variance): 100 (1.0 cm^2 X 100)

MANDATORY QUALITY CONTROL HOLD POINTS

- Tank isolation and leak checks completed.
- Pre-calibration and/or assessment steps completed.
- Specified water level set for integrity assessment.

J. E. Vaile
Quality Control

12/2/91
Date

TEST DEVIATIONS

None

TEST RESULTS

The test criteria have been met, except as noted, under test deviations.

Laurence E Clay
PUREX Regulatory Compliance

12/2/91
Date

APPENDIX F
LEAK TEST QUALITY CONTROL DOCUMENT FOR TK-U4

LEAK TEST
DANGEROUS WASTE TANKS

TANK NO. U-4

Work Plan No. WP-P-90-26
Test Date 10/12/90 to 6/15/90

TEST CRITERIA

- Leak Detection Method: Bubble tube with RUSKA electromanometer
- Tank water level: Below reference tube not more than 2 inches
- Minimum water level hold time: 14 hours
- Data required: Test times, H2O temperature, H2O level, variance of each data value
- Data interval: Minimum of 8 printed records evenly spaced over test
- Maximum water level fluctuation: 0.46 cm
- Instrument sensitivity (maximum variance): 100 (1.0 cm^2 X 100)

MANDATORY QUALITY CONTROL HOLD POINTS

- Tank isolation and leak checks completed.
- Pre-calibration and/or assessment steps completed.
- Specified water level set for integrity assessment.

J. E. Vaille
Quality Control

12/2/91
Date

TEST DEVIATIONS

None

TEST RESULTS

The test criteria have been met, except as noted, under test deviations.

Laurence E. Clay
PUREX Regulatory Compliance

12/2/91
Date

APPENDIX G
COMPLETED RUSKA CALIBRATION JOB CARDS

HES-C10.005 PISCES Job Card

Craft Instrument Tech. Overall Calibration

Facility ...PUREX Jobcard Sequence #: 9001

Inst #: RUSKA # 31092 Appl Code: High Accuracy Due: 8-90

Loop #: APA03 Bldg: 202A Maker: RUSKA Last Done: 8/89

Seq #: 1 Room: [illegible] Model: 6000-150 Procedure: PSCE-4-106

Freq: OnM Loca: [illegible] SHOP Serial #: 31092 Issue Date: 06/02/89

Dwg/Sht/Board/Rev#: N/A / / CVI#: Function Type: Linear

Function Description: TANK CALIBRATOR

Range						
	Input:	.0	To 10	PSI	+/- 0.0025 %	
	Output:	.0	To 10	VOLTS	+/- 0.01 %	

Standards Used: (Traceable to Nationally Recognized Standards)

Input 812-77-01-003 CAL Expiration Date: 8-90

Output 812-44-03-001 CAL Expiration Date: 8-90

((((((((((Data Sheet))))))))))

Calibration Data from Computer Printout

Temp: 25 Deg.C Press: 29.13 IN(HG) VAP. Press: .150 IN(H)

Desired Pressure (PSI)	2	4	5	6	8	10
Actual Pressure (PSI)	1.9876	3.9878	4.9878	5.9876	7.9878	9.9880
Measured Pressure (PSI)						
As Found	1.9876	3.9878	4.9878	5.9876	7.9878	9.9880
~~As Left~~	1.9876	3.9878	4.9878	5.9876	7.9878	9.9880
	(1)	(2)	(3)	(4)	(5)	(6)

DGH 2/14/90 check pac

Work Released 2-7-90 Not Released By

Remarks

REVIEWED RSME FEB 21 1990

HR 2/15/90

Previous Remarks:

Instructions: [redacted] Calibration Tanks must be done [illegible]

Revision Required (Y/N) R Cal/Procedure Data Sheet

Technician 2/1/90 Hours 2.0 Manager 2/1

Discrepancy # DGH Work Order #

MES-010.005X Mid Interval Test Job Card
Craft Instrument Tech. Overall Calibration
Facility ...PUREX Jobcard Sequence #: 900211507

Inst #: RUSKA # 31172 Appl Code: High Accuracy Due: 05/90
Loop #: ZA907 Bldg: 2025 Maker: RUSKA Last Done: 11/89
Seq #: 2 Room: ~~STOR~~ Model: 600-1S0-0 Procedure #: PSCP-4-106
Freq: 08M Loc: Rack Serial #: 31172 Issue Date: 06/02/89
Dwg/Sht/Coord/Rev#: / / / / CN#: Function Type: Linear
Function Description: ~~RUSKA #31172~~ TANK CALIBRATION

HR 2/13/90

Range Input: 0 To 10 PSIG +/- 0.25 %
Output: 0 To 10 VOLTS +/- 1.0 %

Standards Used: Input 82-77201-003 CAL Expiration Date: 8-90
(Traceable to Nationally Recognized Standards) Output 812-49-03001 CAL Expiration Date: 8-90

9113276.1335

<<<<<<<<< Data Sheet >>>>>>>>>

Calibration Data from Computer Printout

Temp: 25 Deg.C Press: 29.13 IN(HG) VAP. Press: 1150 IN(H)

Desired Pressure (PSI)	2	4	5	6	8	10
Actual Pressure (PSI)	1.9876	3.9878	4.9878	5.9876	7.9878	9.9880
Measured Pressure (PSI)	1.9876	3.9878	4.9878	5.9876	7.9878	9.9880
As Found	1.9876	3.9878	4.9878	5.9876	7.9878	9.9880
As Left	1.9876	3.9878	4.9878	5.9876	7.9878	9.9880
check points	①	②	③	④	⑤	⑥

Work Released Donald Haan 2/12/90 Not Released By _____ _/_/_
Remarks next due 8/90 W/rest of Ruskas

Previous Remarks:
Instructions: ALL TANK CALIBRATOR Ruska's must be done Together

Revision Required (Y/N) Cal/Procedure _____ Data Sheet ✓
Technician David Dahl 2/9/90 Hours 2.0 Manager [signature] 2/12/90
Discrepancy # _____ Donald Haan Work Order # _____

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ES-010.005I Mid Interval Test Job Card
raft / Instrument Tech. Overall Calibration
acility ...PUREX Jobcard Sequence #: 900211506

Inst #: RUSKA # 33470 Appl Code: High Accuracy Due: 05/90
Loop #: ZAA06 Bldg: 202A Last Done: 11/89
Seq #: 2 Procedure #: PSCP-4-106
Freq: 06M 33470 Issue Date: 06/02/89
wg/Sht/Coord/Rev#: N/A / / / CVI#: Function Type: Linear
Function Transducer Calibration

HPR 2/15/90

ange Input: .0 To 10
Output: .0 To 10 VOLTS +/- .01 %

tandards Used: Input 812-77-01-003 CAL Expiration Date: 8-90
Traceable to Nationally
Recognized Standards) Output 812-49-03-001 CAL Expiration Date: 8-90

WHC-SD-3276-1336

<<<<<<<<< Data Sheet >>>>>>>>>

Calibration Data from Computer Printout

Temp: 25 Deg.C Press: 29.13 IN(HG) VAP. Press: .150 IN(H)

Desired Pressure (PSI)	2	4	5	6	8	10
Actual Pressure (PSI)	1.9876	3.9878	4.9878	5.9876	7.9878	9.9880
Measured Pressure (PSI)						
As Found	1.9876	3.9878	4.9878	5.9876	7.9878	9.9880
As Left	1.9876	3.9878	4.9878	5.9876	7.9878	9.9880
	(1)	(2)	(3)	(4)	(5)	(6)

check points

ork Released Donald Ashman 2/11/90 Not Released By / /

emarks Make next due 8/90 w/rest of Ruska's

REVIEWED

revious Remarks:

nstructions:

RSME

evision Required N (Y/N) Cal/Procedure Data Sheet ✓

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Technici Donald Ashman 2/11/90 Hours 2.0 Manager 2/12/90

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Discrepancy # Work Order #

Donald Ashman

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MES-010.005
Craft Instrument Tech.
Facility ...PUREX

PISCES Job Card
Overall Calibration

Jobcard Sequence #: 900116

Inst #: RUSKA FLUKE #31700 07 Appl Code: High Accuracy Due: 02/90
Loop #: ZABOD Bldg: 202A Maker: FLUKE Last Done: 08/87
Seq #: 1 Room: AMU Model: 8810A Procedure #: PSCP-4-100
Freq: 06M [redacted] 3170007 Issue Date: 06/01/87
Dwg/Sht/Coord/Rev#: N/A / / / CVI#: Function Type: Linear
Function Description: M3/M4/M5/M6/N53 RUSKA VOLTMETER ACCT TKS

Range	Input:	.0	To 10.0	VOLTS	+/-	.0015 %
	Output:	.0	To 10.0	VOLTS	+/-	0.002 %

Standards Used: (Traceable to Nationally Recognized Standards)
Input 82-45-03-001 CAL Expiration Date: 8-90
Output Readout CAL Expiration Date: N/A

Calibration Data

CK PT	Input / Output Requirements: Specified Input Value	Specified Output Value	-Limit of Tolernce	+Limit of Tolernce	Output Condition: As Found Value	As Found Tolerance (In/Out)	As Left Value
1	0.0000	0.0000	-0.0002	0.0002	.0000	I	.0000
2	2.0000	2.0000	1.9998	2.0002	2.0001	I	2.0001
3	4.0000	4.0000	3.9998	4.0002	4.0001	I	4.0001
4	6.0000	6.0000	5.9998	6.0002	6.0001	I	6.0001
5	8.0000	8.0000	7.9998	8.0002	8.0001	I	8.0001
6	10.0000	10.000	9.9998	10.0002	10.0001	I	10.0001

HR² 2/15/90 [redacted]

Work Released [redacted] 2/8/90 Not Released By _____

Remarks _____

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Previous Remarks:

Instructions: SAME AS ZABOB-1

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Data Sheet ✓

Revision Required (Y/N) Cal/Procedure _____

Technician [redacted] 2/2/90 Hours .75 Manager [redacted] 2/15

Discrepancy # [redacted] Work Order # _____

MES-010.005 PISCES Job Card

Craft Instrument Tech. Overall Calibration

Facility ...PUREX Jobcard Sequence #: 900116

Inst #: RUSKA FLUKE #29451 08 Appl Code: High Accuracy Due: 02/90

Loop #: ZAB03 Bldg: 202A Maker: FLUKE Last Done: 08/89

Seq #: 1 Room: STGGA Model: 8810A Procedure #: PSCP -106

Freq: 06M Locn: RUSKA ROOM Serial #: 2945108 Issue Date: 08/03/89

Dwg/Sht/Coord/Rev#: N/A / / / CVI#: Function Type: Linear

Function Description: RUSKA FLUKE # 2945108

Range	Input:	.0	To 10	VOLTS	+/-	.0015 %
	Output:	.0	To 10	VOLTS	+/-	.002 %

Standards Used: Input 872-45-05-001 CAL Expiration Date: 8-90

(Traceable to Nationally Recognized Standards) Output Readout CAL Expiration Date: N/A

Calibration Data

CK PT	Input / Output Requirements: Specified Input Value	Specified Output Value	-Limit of Tolernce	+Limit of Tolernce	Output Condition: As Found Value	As Found Tolerance (In/Out)	As Left Value
1	0.0000	0.0000	-0.0002	0.0002	.0000	I	.0000
2	2.0000	2.0000	1.9998	2.0002	1.9999	I	1.9999
3	4.0000	4.0000	3.9998	4.0002	4.0000	I	4.0000
4	6.0000	6.0000	5.9998	6.0002	6.0000	I	6.0000
5	8.0000	8.0000	7.9998	8.0002	8.0000	I	8.0000
6	10.0000	10.0000	9.9998	10.0002	10.0000	I	10.0000

HR 2/15/90

Work Released [signature] 2/8/90 Not Released By _____

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Remarks _____

Previous Remarks:

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Instructions:

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Revision Required (Y/N) Cal/Procedure _____ Data Sheet ✓

Technician [signature] 2/8/90 Hours 1.5 Manager [signature] 2/10

Discrepancy # _____ Work Order # _____

MES-010.005 PISCES Job Card

Craft ... Instrument Tech. Overall Calibration

Facility ...PUREX Jobcard Sequence #: 900116 22

Inst #: RUSKA FLUKE #36750 11 Appl Code: High Accuracy Due: 02/90
Loop #: ZAB04 Bldg: 202A Maker: FLUKE Last Done: 08/89
Seq #: 1 Room: WHTRM Model: 8810A Procedure #: PSCP-4-106
Freq: 06M Locn: N-CELL Serial #: 3675011 Issue Date: 06/02/89
Dwg/Sht/Coord/Rev #: N/A / / / CVI#: Function Type: Linear

Function Description: RUSKA FLUKE #3675011

Range						
Input:	.0	To	10	VOLTS	+/-	.0015 %
Output:	.0	To	10	VOLTS	+/-	.002 %

Standards Used: (Traceable to Nationally Recognized Standards)
Input 872-45-03-01 CAL Expiration Date: 1-8-90
Output Fluke CAL Expiration Date: N/A

Calibration Data

CK	Input / Output Requirements: Specified Input Value	Specified Output Value	-Limit of Tolerance	+Limit of Tolerance	Output Condition: As Found Value	As Found Tolerance (In/Out)	As Left Value
1	0.0000	0.0000	-0.0002	0.0002	.0000	I	.0000
2	2.0000	2.0000	1.9998	2.0002	2.0001	I	2.0001
3	4.0000	4.0000	3.9998	4.0002	4.0001	I	4.0001
4	6.0000	6.0000	5.9998	6.0002	6.0002	I	6.0002
5	8.0000	8.0000	7.9998	8.0002	8.0002	I	8.0002
6	10.0000	10.0000	9.9998	10.0002	10.0002	I	10.0002

HR 2/15/90 RUSKA FLUKE MSC

Work Released [signature] 2/8/90 Not Released By ____

Remarks ____

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Previous Remarks:

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Instructions:

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Revision Required No Cal/Procedure ____ Data Sheet 5

Technician [signature] 2/8/90 Hours 5 Manager [signature] 2/12

Discrepancy # ____ Work Order # ____

Craft — Instrument Tech. ([illegible]

Facility ...PUREX

Job and Sequence #: [illegible]3212

Inst #: RUSKA # 33470	Appl Code: High Accuracy		Due: [illegible]
Loop #: ZAACE	Bldg: [illegible] TANK CALIBRATOR	Maker: RUSKA	Last Done: 02/90
Seq #: 2	Room: [illegible]	Model: 6000-1S0-0	Procedure #: PSCP-[illegible]-105
Freq: 06M	Loc: ~~RUSKA SHOP~~	Serial #: 33470	Issue Date: 06/02/89

Dwg/Sht/Coord/Rev#: N/A / / / CVI#: Function Type: Linear

Function Description: [illegible] RUSKA #33470

Range	Input:	.0	To	10	PSIG	+/-	.0025 %
	Output:	.0	To	10	VOLTS	+/-	.01 %

Standards Used: Input 812-77-01-005 CAL Expiration Date: 7-91

(Traceable to Nationally Recognized Standards) Output 812-15-03-001 CAL Expiration Date: 7-91

Accepted

Data Sheet

Calibration Data from Computer Printout

Temp: 25 Deg.C Press: 29.3 IN HG VAP. Press: .684 IN(H)

Desired Pressure (PSI)	2	4	5	6	8	10
Actual Pressure (PSI)	1.9876	3.9878	4.9878	5.9874	7.9878	9.9880
Measured Pressure (PSI)	1.9876	3.9878	4.9878	5.9876	7.9878	9.9880
As Found	1.9876	3.9878	4.9883	5.9876	7.9878	9.9886
As Left	1.9876	3.9878	4.9878	5.9876	7.9878	9.9880

Work Released R. L. Berg 4-23-90 Not Released By: ______ _/_

Remarks ______

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Previous Remarks:

Instructions: ALL TANK CALIBRATOR RUSKAS MUST BE DONE TOGETHER.

Revision Required (Y/N) Cal/Procedure ______ Data Sheet ______

Technician [signature] 8-23-90 Hours 2.0 Manager [signature] 8/2[illegible]

Discrepancy # ______ Work Order # ______

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MES-010.005
Craft Instrument Tech.
Facility ...PUREX

PISCES Job Card
Overall Calibration

Inst #: RUSKA # 35430 Appl Code: High Accuracy Due: 08/90
Loop #: ZAA04 Bldg: [redacted] Mfgr: RUSKA Last Date: 08/90
Seq #: 1 Rcom: [redacted] Model: 6000-150-0 Procedure #: PSCP-4-105
Freq: 06M Locn: [redacted] Serial #: 35430 Issue Date: 06/02/8[illegible]
Dwg/Sht/Coord/Rev#: [redacted] VI#: Function Type: Linear
Function Description: [redacted]

Range Input: .0 To 10.0 PSI +/- 0.0025 %
Output: .0 To 10.0 VOLTS +/- 0.01 %

Standards Used: (Traceable to Nationally Recognized Standards)
Input 812-77-01-003 CAL Expiration Date: 7-91
Output 812-45-03-001 CAL Expiration Date: 7-91

ACCEPTED

((((((Data Sheet))))))

Calibration Data From Computer Printout

Temp: 25 Deg.C Press: 29.3 IN(HG) VAP. Press: .684 IN(H)

Desired Pressure (PSI)	2	4	5	6	8	10
Actual Pressure (PSI)	1.9876	3.9878	4.9878	5.9876	7.9878	9.9880
Measured Pressure (PSI)						
As Found	1.9876	3.9878	4.9873	5.9876	7.9878	9.9884
As Left	1.9876	3.9878	4.9878	5.9876	7.9878	9.9880

Work Released R Beam 8/23/90 Not Released By _____ __/__/__

Remarks _____

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Previous Remarks:

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Instructions:

Revision Required _____ Cal/Procedure _____ Data Sheet _____

Technician [signature] 8/23/90 Hours 2.0 Manager [signature] 8/23/90

Discrepancy # _____ Work Order # _____

MES-010.005
Craft Instrument Tech.
Facility ...PUREX

PISCES Job Card
Overall Calibration

Job & Sequence #: 19207062142

Inst #: RUSKA # 31172 Appl Code: High Accuracy Due: 03/90
Loop #: ZAA07 Bldg: 202A Maker: RUSKA Last Done: 02/90
Seq #: 2 Room: AMU Model: 600-150-0 Procedure #: PSCP-4-56
Freq: 06M Locn: RUSKA SHOP Serial #: 31172 Issue Date: 07/02/87
Dwg/Sht/Coord/Rev#: N/A / / / CVI# Function Type: Linear
Function Description: ~~Tank Calibrator~~ RUSKA 600-150-0

Range Input: .0 To 10 PSIG 0.25 %
Output: .0 To 10 VOLTS +/- 1.0 %

Standards Used: (Traceable to Nationally Recognized Standards)
Input 812-77-01-003 CAL Expiration Date: 7.91
Output 812-75-03-001 CAL Expiration Date: 7.91

Accepted

Data Sheet

Calibration Data from Computer Printout

Temp: 25 Deg.C Press: 29.3 IN(HG) VAP. Press: .184 IN(H)

Desired Pressure (PSI)	2	4	5	6	8	10
Actual Pressure (PSI)	1.9876	3.9878	4.9878	5.9876	7.9878	9.9880
Measured Pressure (PSI)	1.9876	3.9878	4.9878	5.9876	7.9878	9.9880
As Found	1.9876	3.9878	4.9876	5.9876	7.9878	9.9880
As Left	1.9876	3.9878	4.9878	5.9876	7.988	9.9880

Work Released R L Burp 8/29/90 Not Released By _____ / /

Remarks _____

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Previous Remarks:

Instructions: ALL TANK CALIBRATOR RUSKAS MUST BE DONE TOGETHER. RECEIVED

Revision Required (Y/N) Cal/Procedure _____ Data Sheet ✓

Technician [signature] 8/23/90 Hours 2.0 Manager [signature] 8/23

Discrepancy # _____ Work Order # _____

MES-010.005 PISCES Job Card
Craft Instrument Tech. Overall Calibration
Facility ...PUREX 78MW 8/24/90 Jobcard Sequence #: 90070621

Inst #: RUSKA FLUKE #29451 C8 Appl Code: High Accuracy Due: 08/90
Loop #: ZAB03 Bldg: 202A Maker: FLUKE Last Done: 02/90
Seq #: 1 Room: [redacted]: E810A Procedure #: PSCF-4-106
Freq: 06M Locn: [redacted] #: 2945108 Issue Date: 6/02/89
Dwg/Sht/Coord/Rev#: [redacted] Function Type: Linear

Function Description: RUSKA FLUKE # 2945108

Range						
Input:	.0	To	10	VOLTS	+/-	.0015 %
Output:	.0	To	10	VOLTS	+/-	.002 %

Standards Used: Input 812-45-03-001 CAL Expiration Date: 2-91
(Traceable to Nationally Recognized Standards) Output Indication CAL Expiration Date: N/A

Calibration Data

9143276.1343

Pt	Input / Output Requirements: Specified Input Value	Specified Output Value	-Limit of Tolerance	+Limit of Tolerance	Output Condition: As Found Value	As Found Tolerance (In/Out)	As Left Value
1	0.0000	0.0000	-0.0002	0.0002	0.0000	IN	0.0000
2	2.0000	2.0000	1.9998	2.0002	1.9998	IN	2.0000
3	4.0000	4.0000	3.9998	4.0002	3.9997	Out	4.0000
4	6.0000	6.0000	5.9998	6.0002	5.9996	Out	6.0000
5	8.0000	8.0000	7.9998	8.0002	7.9995	Out	8.0000
6	10.0000	10.0000	9.9998	10.0002	9.9993	Out	10.0000

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Work Released [signature] 8/23/90 Not Released By ___ / /

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Remarks

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Previous Remarks:

Instructions:

Revision Required (Y/N) Cal/Procedure ___ Data Sheet ✓

Technician [signature] 8/23/90 Hours 2.0 Manager [signature] 8/23

Discrepancy # ___ Work Order # ___

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Craft Instrument Tech. WHC-SD-... -TRP-055 Rev 0 Page 93
Facility ...PUREX Overall Calibration

7/7mm 8/24/90 Job #/Sequence #: 90...06216

Inst #: RUSKA FLUKE #29451 10 Appl Code: High Accuracy Due: 08/90
Loop #: ZA801 Bldg: 202A Maker: FLUKE Last Done: 02/90
Seq #: 1 Room: [redacted] TANK 40 Model: 5810A Procedure #: ?GCP-4-106
Freq: 06M Locn: [redacted] Serial #: 2945110 Issue Date: 05/02/89
Dwg/Sht/Coord/Rev#: N[redacted] CVI#: Function Type: Linear

Function Description: RUSKA FLUKE # 2945110

Range						
	Input:	.0	To 10	VOLTS	+/-	.0015 %
	Output:	.0	To 10	VOLTS	+/-	.002 %

Standards Used: Input I 812-45-03-006 CAL Expiration Date: 7-91
(Traceable to Nationally
Recognized Standards) Output Evaluation CAL Expiration Date: N/A

Calibration Data

	Input Output Requirements				Output Condition		
	Specified Input Value	Specified Output Value	-Limit of Tolerance	+Limit of Tolerance	As Found Value	As Found Tolerance (In/Out)	As Left Value
[illegible]	0.0000	[illegible]	-0.0002	[illegible]	0.0000	IN	0.0000
[illegible]	2.0000	[illegible]	1.9998	[illegible]	1.9997	Out	2.0000
-3	4.0000	[illegible]	3.9998	[illegible]	3.9996	Out	4.0000
-4	6.0000	[illegible]	5.9998	6.0002	5.9993	Out	6.0000
5	8.0000	[illegible]	7.9998	8.0002	7.9992	Out	8.0000
-6	10.0000	10.0000	9.9998	10.0002	9.9990	Out	10.0000

Accepted

NOTICE OF DISCREPANCY
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Work Released R L Barger 8/23/90 Not Released By RSME / /

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Previous Remarks:

Instructions:

Revision Required Cal/Procedure Data Sheet ✓

Technician [signature] 8-23-90 Hours 2.0 Manager [signature] 8-23

Discrepancy # Work Order #

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MES-010.005 PISCES Job Card

Craft Instrument Tech. Overall Calibration

Facility ...PUREX

Job [illegible] Request #: 900706

Inst #: RUSKA FLUKE #29451 07 Appl Code: High Accuracy Due: 08/90

Loop #: ZAB02 Bldg: 202A FLUKE Last Done: 02/

Seq #: 1 Room: [redacted] Model: 6810A Procedure #: 76CP-4-106

Freq: 06M Locn: [redacted] 2945107 Issue Date: /02/89

Dwg/Sht/Coord/Rev#: [redacted] Function Type: Linear

Function Description: RUSKA FLUKE # 2945107

Range	Input:	.0	To 10	VOLTS	+/-	.0015 %
	Output:	.0	To 10	VOLTS	+/-	.002 %

Standards Used: (Traceable to Nationally Recognized Standards)

Input 812-45-03-001 CAL Expiration Date: 2-91

Output Fudication CAL Expiration Date: NA

Calibration Date

	Input / Output Requirements				Output Condition		
	Specified Input Value	Specified Output Value	-Limit of Tolerance	+Limit of Tolerance	As Found Value	As Found Tolerance (In/Out)	As Left Value
1	0.0000	0.0000	-0.0002	0.0002	0.0000	IN	0.0000
2	2.0000	2.0000	1.9998	2.0002	1.9998	IN	2.0000
3	4.0000	4.0000	3.9998	4.0002	3.9996	Out	4.0000
4	6.0000	6.0000	5.9998	6.0002	5.9994	Out	6.0000
5	8.0000	8.0000	7.9998	8.0002	7.9993	Out	8.0000
6	10.0000	10.0000	9.9998	10.0002	9.9991	Out	10.0000

Accepted

PM 3276.005

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Work Released R. L. Berg 8.23.90 Not Released By _____ __/__/__

Remarks _____

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Previous Remarks:

Instructions:

Revision Required (Y/N) Cal/Procedure _____ Data Sheet ✓

Technician [signature] 8.23.90 Hours 2.0 Manager [signature] 8/23

Discrepancy # _____ Work Order # _____

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APPENDIX H
RUSKA SCHEMATICS AND PHOTOGRAPH

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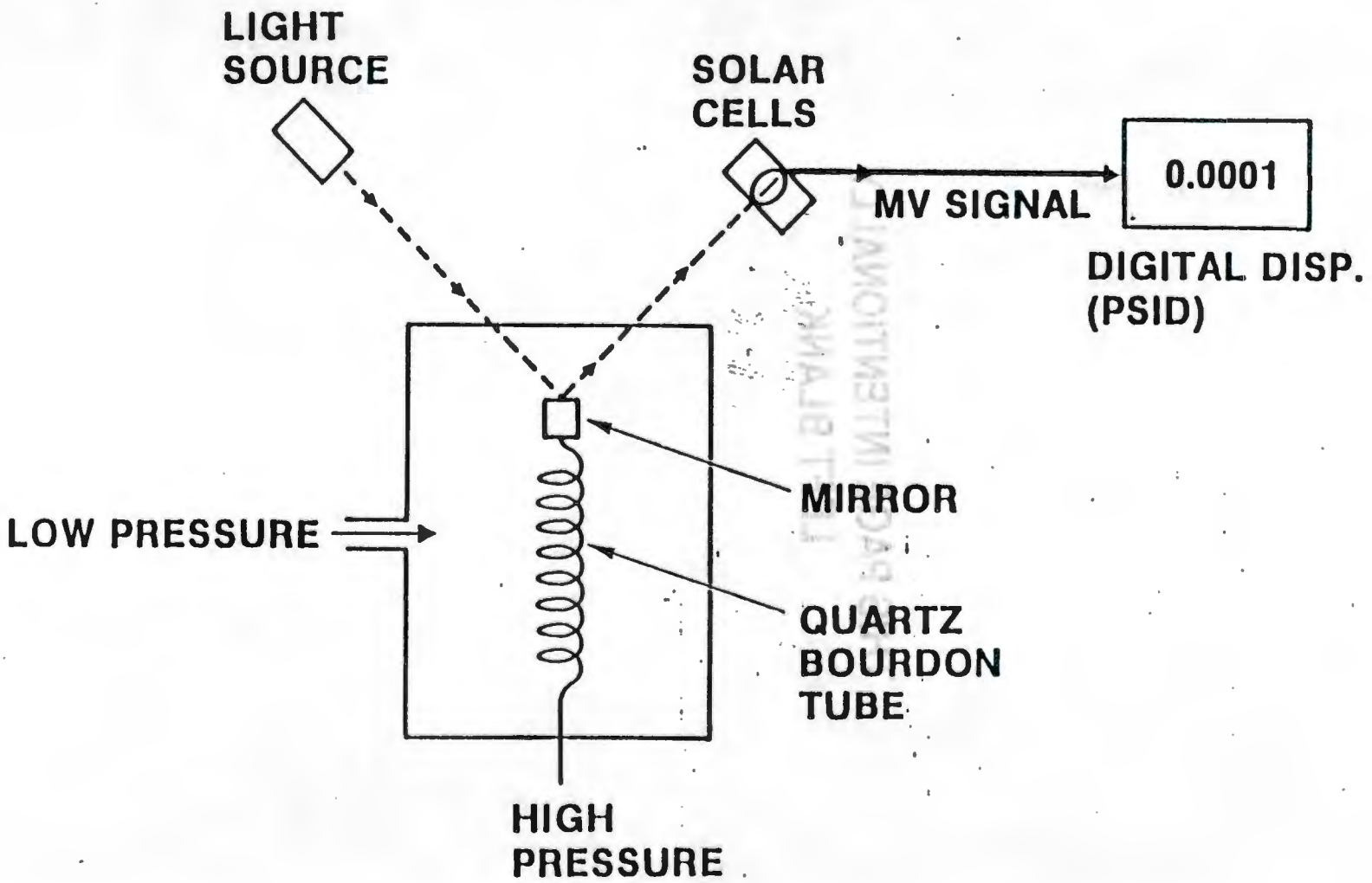
RUSKA Schematic



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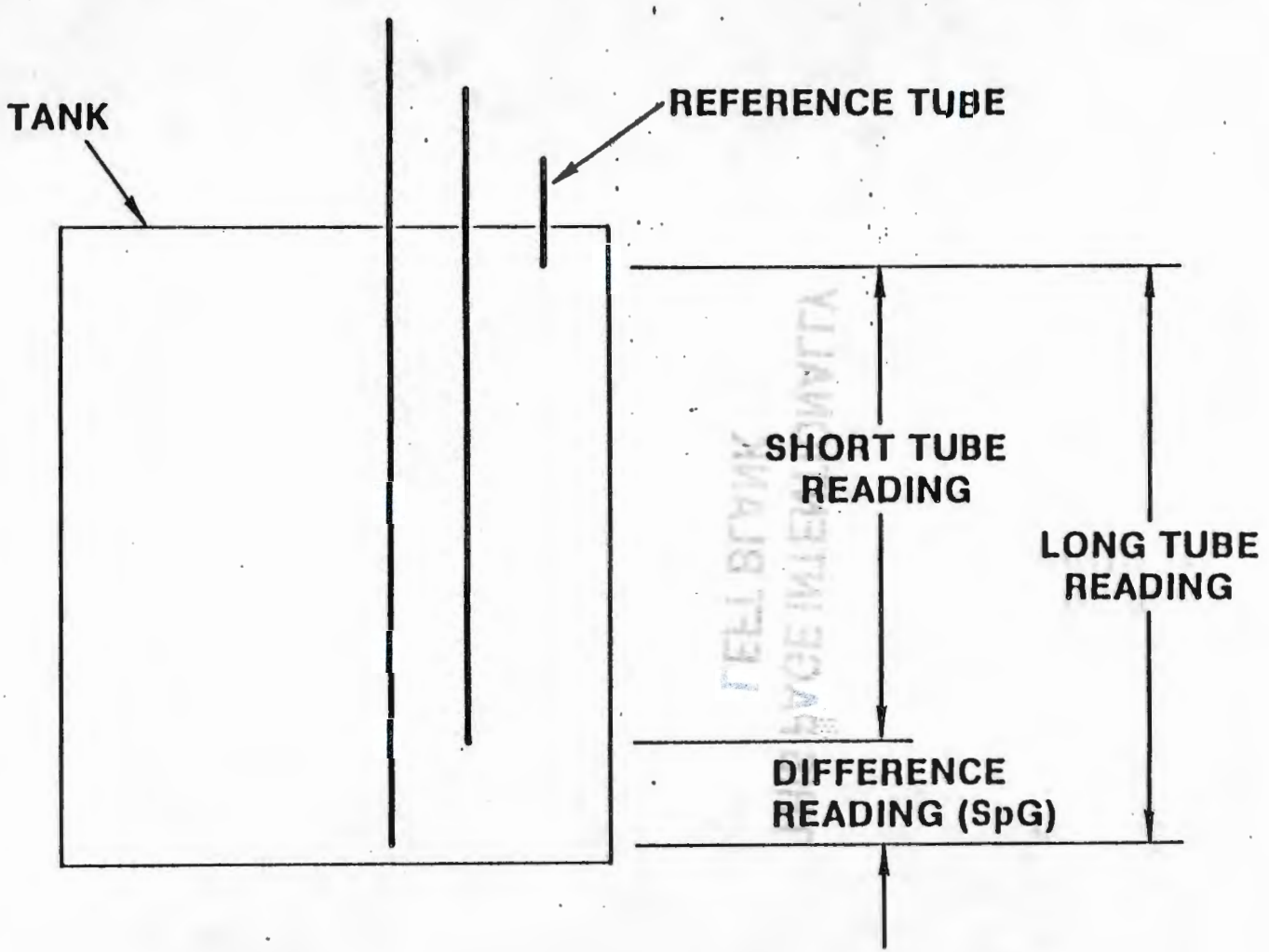
RUSKA Diptube Nomenclature



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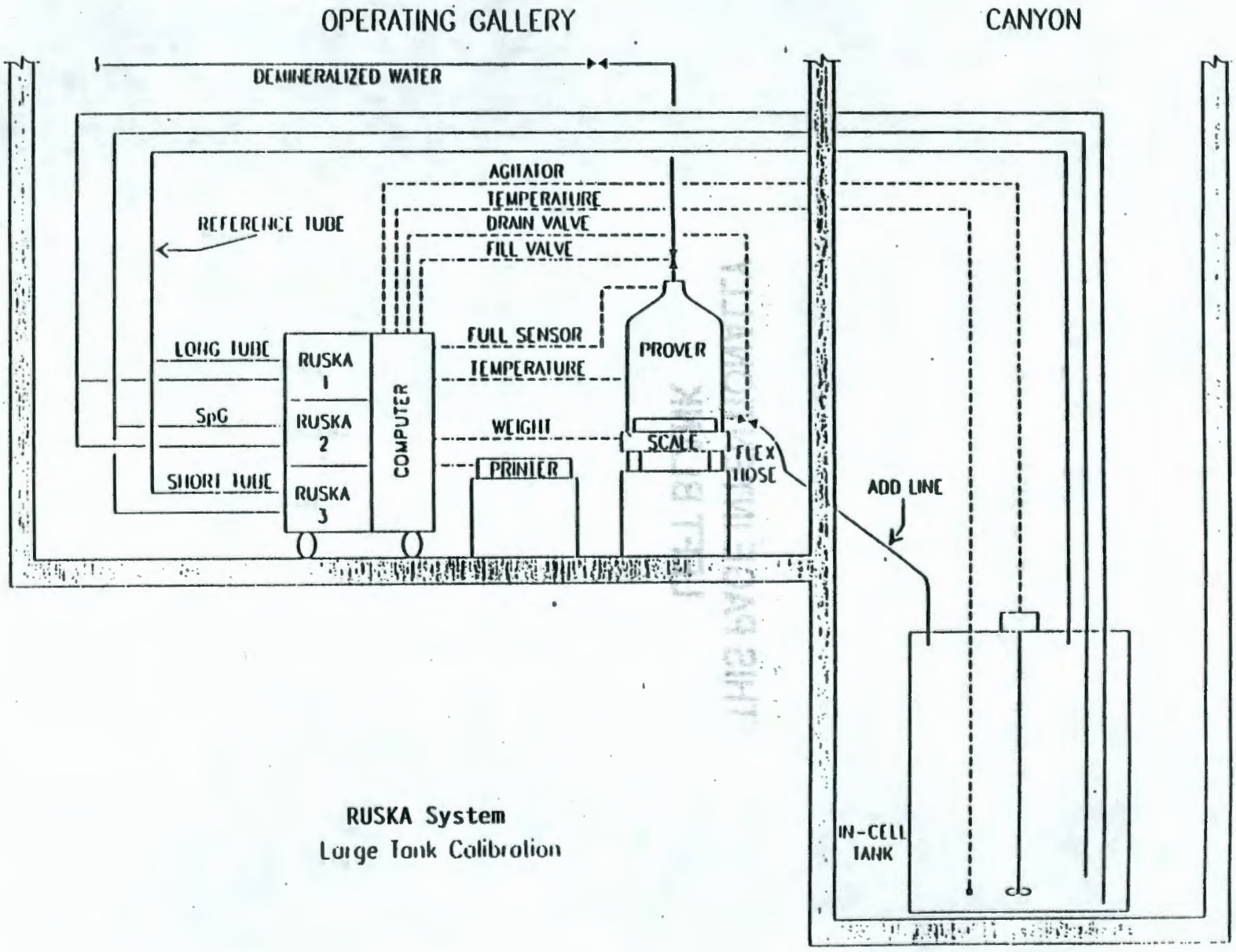

RUSKA System
Large Tank Calibration

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RUSKA Computer Console and Printer

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