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Fluor Federal Services, Inc. Paducah Deactivation Project

CP4-OP-0236 **Rev. 1A**	**TITLE:** In Situ Chemical Treatments	**Page 1 of 47**
DOCUMENT CATEGORY:	☐ Administrative ☒ Technical (Operations) ☐ Technical (Support)	
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GDP FACILITIES, OPERATIONS, AND INFRASTRUCTURE **SUBJECT MATTER AREA:** FACILITY OPERATIONS	**WRITER:** William Steffen, Facility Operations Supervisor Signature: _____ Date: 3/29/16
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REVISION/CHANGE LOG

Revision/Change Letter	Description of Changes	Pages Affected	Date of Revision/Change
0	Initial Issue	ALL	3/6/2016
1	Incorporate Concurrent Verification for TG transfers, update R-114 system labeling, revise TSR 5.6.8.2 flowdown.	ALL	3/22/2016
1A	Add step to pressure ICT target location prior to taking baseline scans, remove reference to caution tagging control switches	12, 13, 16-18, 22, 24, 30, 32, 34, 44	3/29/16

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1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides instructions for the performance of In Situ Chemical Treatments (ICT) of selected systems for decontamination activities.

1.2 Scope

This procedure is applicable to all activities involved with performance of ICT, including the preparation for and the recovery from these activities.

2.0 REFERENCES

2.1 Use References

- CP3-HS-2008, *Accident Prevention/Equipment Control Tags*
- CP4-OP-0112, *Operation of the Cascade Buffer Systems*
- CP4-OP-0436, *Operation of Surge Drums*
- CP4-OP-0437, *Chlorine Trifluoride, Fluorine, and Mixed Gas Leaks in C-310, C-350, or Process Buildings*
- CP4-OP-0442, *Handling and Storage of Chlorine Trifluoride, Fluorine, and Mixed Gases in C-350*
- CP4-OP-0445, *Transferring Mixed Gas From C-350 or F2 from C-410 to the Cascade*
- CP4-OP-0456, *Operation of the Portable Cell Treatment Cart System*
- CP4-OP-1119, *Cell Evacuation*
- CP4-OP-1120, *Obtaining Negatives in Static and Auxiliary Systems*
- CP4-OP-1121, *Cascade Valve and Leak Rating Operations*
- Job Hazard Analysis (JHA)-9915, *Performance of ICT and Operation of The Portable Cell Treatment Cart*

2.2 Source References

- CP1-NS-3000, *Documented Safety Analysis for the Department of Energy Paducah Site Deactivation Project*
- CP2-HS-2010, *Process Safety Information Chlorine Trifluoride System*
- CP2-NS-2009, *Process Safety Information for Fluorine System*
- CP2-NS-3010, *Hazard Analysis for the Department of Energy Paducah Site Deactivation Project Process Building Facilities*
- CP2-NS-3014, *Hazard Analysis for the Department of Energy Paducah Site Deactivation Project In Situ Chemical Treatment Activities*
- CP3-HS-2018, *Process Safety Management of Highly Hazardous Chemicals*
- CP3-OP-0012, *Independent Verification*
- Design Analysis Calculation (DAC)-CIE-FA1030-0004, *Fluor Paducah Deactivation – Mod 0013 / Portable Cell Treatment Carts*

3.0 COMMITMENTS

- CP1-NS-3001, *Technical Safety Requirements for the Department of Energy Paducah Site Deactivation Project*
- Nuclear Criticality Safety Approval (NCSA) CAS-001, *Freezer Sublimers*
- Nuclear Criticality Safety Evaluation (NCSE) 095, *Operation and Shutdown of the Gaseous Diffusion Cascade*

4.0 PRECAUTIONS AND LIMITATIONS

4.1 Precautions

4.1.1 Precautions shall be taken to prevent Treatment Gas (TG) from entering a system that may be contaminated with organic or oxidizable materials – such as oils, greases, water, and/or R-114.

4.1.2 CF_4 observed during treatment could be an indication that a reaction with organic material may be taking place within the ICT target location.

4.1.3 ClO_3F observed during treatment could be an indication that a reaction with moisture may be taking place within the ICT target location.

4.2 Limitations

TSR
5.5.2.4
5.5.2.9
5.6.5.1
5.6.6.1
5.6.7.1.
5.6.8.1
5.6.8.2
NCSA
CAS-001
NCSE
095

4.2.1 Prior to TG transfers to the building, Section **6.1** shall be performed.

4.2.2 Treatment Gas (TG) shall not be charged to a header or an ICT target location **unless** permission has been obtained from the Department of Energy (DOE).

TSR 3.3.1 NCSE 095

4.2.3 Actions of TSR LCO 3.3.1 shall be taken anytime ICT target location pressure is **greater than 14.3 psia** as read on PI-07 **while** in Mode ICT.

TSR 5.6.7.1

4.2.4 ICT target locations other than a 000 or 00 cell shall be limited to the volume equivalent to a 000 cell.

TSR 5.6.8.3

4.2.5 Purge and Evacuation (P&E) pumps shall **NOT** be used to transfer TG from header to ICT target location.

TSR 5.6.9.1

4.2.6 P&E pumps shall **NOT** be used to evacuate any material containing ClF_3/F_2 **unless** Laboratory personnel have sampled ICT target location **and** results for combined ClF_3 and F_2 concentration is **less than 8 mole %**.

NCSE 095

4.2.7 Fissile UF_6 shall **NOT** be added to a cell that has an R-114 system that has been drained and capped **unless** each converter cooler associated with the R-114 system has inlet and outlet R-114 lines capped.

4.2.8 **When** responding to a chlorine trifluoride (ClF_3), fluorine (F_2), or mixed gas (MG) leak, CP4-OP-0437, *Chlorine Trifluoride, Fluorine, and Mixed Gas Leaks in C-310, C-350, or Process Buildings*, shall be referred to.

TSR 5.5.2.4

4.2.9 The total amount of Treatment Gas (TG) charged to any one ICT target location shall be limited to **590 pounds**.

TSR 5.5.2.4

4.2.10 The total amount of TG allowed in any one building shall be limited to **4745 pounds**.

5.0 PREREQUISITES

Review JHA-9915, *Performance of ICT and Operation of The Portable Cell Treatment Cart*.

6.0 INSTRUCTIONS

6.1 ICT Preparation

<u>Facility Operations Personnel</u>

NOTE:

Steps **6.1.1** through **6.1.11** may be performed in any order/concurrently prior to performance of Step **6.1.12**.

Guidance for temperature monitoring for ICT target locations other than ‘00’ or ‘000’ cells will be provided through the Front Line Manager (FLM) by Subject Matter Expert (SME) and Engineering.

Automatic Data Processing (ADP) system points are for remote monitoring capability only.

As many points as possible listed in Step **6.1.1** should be functioning to best assess conditions in the cell during ICT.

6.1.1 **If** performing ICT on a ‘00’ or ‘000’ cell, **then** perform the following:

A. **If** a ‘00’ cell, **then** check the following temperature/pressure points:

- Stage 1 through 10 A and B temperature points on trendicator
- Stage 1 through 10 A and B temperature points on ADP system
- High Side Pressure (HSP) point on ADP system

B. **If** a ‘000’ cell, **then** check the following temperature/pressure points:

- Stage 1 through 8 A and B temperature points on trendicator
- Stage 1 through 8 A and B temperature points on ADP system
- High Side Pressure (HSP) point on ADP system

C. **If** any points in Step **6.1.1.A** or **6.1.1.B** are **NOT** functioning, **then** notify FLM.

D. Document temperature/pressure point check on CP4-OP-0236-F01, *ICT Preparation Checklist*.

NOTE

For ‘00’ and ‘000’ cells, heaters are set up outside of cell housing (usually 4 heaters total) and ducted to the inside of the housing. For all other locations, heaters will be set up according to work package instructions.

Step **6.1.2** should be performed early in the preparation process to allow ICT target location piping/components to heat up and equalize to the target temperature of **120°F**.

6.1.2 Ensure heaters are positioned at equipment housing **and** operate as follows:

A. Ensure heater cord is connected to a 480 VOLTS supply disconnect.

B. Ensure heater inlet thermostat (located at middle of heater) is set at **123°F**.

C. Ensure heater outlet thermostat (located to discharge end of heater) is set **between 123°F** and the second mark above **123°F**.

D. Close 480 VOLTS supply disconnect.

E. Position heater power switch to HEAT.

F. Check heater is operating as follows:

- Heater fan is running through audible indications
- Heater is providing heat as indicated by rising temperatures at outlet with a temperature gun or as indicated by rising ICT target location temperatures
- Heater has no unusual noise or vibration

G. Document that heaters are positioned and operating on CP4-OP-0236-F01, *ICT Preparation Checklist*.

H. Adjust heater inlet and/or outlet thermostats as necessary to achieve target temperature.

I. Perform the following at **least** shiftly **and** document on CP4-OP-0236-F05, *ICT Auxiliary Checksheet*:

1. Scan heater cord connection to 480 VOLTS supply disconnect with thermal imager or temperature gun.

2. **If** connection indicates **greater than 110°F**, **then** contact FLM for further instructions.

3. **If** connection indicates **greater than 150°F**, **then** open 480 VOLTS supply disconnect **and** notify FLM.

6.1.3 **If** preparing a cell or auxiliary booster/P&E system for ICT, **then** perform the following:

A. **If** ICT target location has an associated Freezer/Sublimer (F/S), **then** ensure the following **and** document on CP4-OP-0236-F01, *ICT Preparation Checklist*:

1. The following F/S block valves are closed and caution tagged according to CP3-HS-2008, *Accident Prevention/Equipment Control Tags* with tags stating "Do **NOT** Operate – System Isolated for ICT" or similar wording:

- FS B1 A LINE VALVE
- FS B2 B LINE VALVE

2. The following F/S valve breakers are open and caution tagged according to CP3-HS-2008 with tags stating "Do **NOT** Operate – System Isolated for ICT" or similar wording:

- FS B1 FREEZER SUBLIMER "A" LINE VALVE
- FS B2 FREEZER SUBLIMER "B" LINE VALVE

NOTE:

Maintenance processes require that R-114 be removed and an R-114 negative be obtained prior to opening the F/S R-114 system. Due to this, NCSA CAS-001 requirements are completed as part of cutting and capping the F/S R-114 system.

TSR 5.5.2.9 NCSA CAS-001

3. Ensure F/S R-114 system has been cut and capped away from the R-114 distribution system by review of work package documentation **or** visual verification.

NCSA CAS-001

4. Ensure F/S R-114 system is pressured with dry air to **between 3** and **5 psig** as read on ICT target location F/S R-114 PIPING Pressure Indicator (PI) as follows:

a) **If** pressure is **less than 3 psig**, **then** perform the following:

1) Contact Shift Coordinator to determine that plant air system meets the following requirements and that Utilities is notified of plant air usage:

- Moisture alarm in C-300 is clear
- Plant capacity can support use of air

2) Ensure air hose tagged 'For R-114 System Pressuring Use' and an air hose vent attachment is connected between PLANT AIR SUPPLY CONNECTION and F/S R-114 SYSTEM CONNECTION.

3) Open PLANT AIR SUPPLY VALVE located at F/S R-114 pump.

4) Ensure secondary pressure regulator PI downstream of F/S R-114 SYSTEM CONNECTION indicates **between 3 and 5 psig**.

- **If** secondary pressure regulator PI is **NOT between 3 and 5 psig**, **then** request FLM contact Maintenance to adjust regulator.

5) Open F/S R-114 SYSTEM AIR ISOLATION VALVE **until** F/S R-114 PIPING PI indicates **between 3 and 5 psig**, **then** close F/S R-114 SYSTEM AIR ISOLATION VALVE.

6) Close PLANT AIR SUPPLY VALVE.

7) Open vent valve on air hose.

8) **When** air is no longer issuing from vent (as determined by audible indications and/or feel), **then** close vent valve on air hose.

9) Disconnect air hose from PLANT AIR SUPPLY CONNECTION and F/S R-114 SYSTEM CONNECTION **and** cap/plug hose ends.

b) **If** pressure is **greater than 5 psig**, **then** open F/S R-114 SYSTEM VENT VALVE **until** F/S R-114 PIPING PI indicates **between 3 and 5 psig**, **then** close F/S R-114 SYSTEM VENT VALVE.

5. **If** inside the F/S R-114 system cut and cap boundaries, **then** ensure F/S R-114 DRAIN valve is open

B. **If** preparing an ICT target location containing axial compressors (10 compressors in‘00’ cells, 8 compressors in‘000’ cells, the ‘A’ to 310 booster, or the ‘A’ to C-335 booster), **then** ensure the following for each compressor **and** document on CP4-OP-0236-F01, *ICT Preparation Checklist*:

1. The following seal system lines at the compressor bell housings are capped/crimped/plugged on the compressor side:

- Discharge or ‘B’ Seal Feed lines
- Discharge or ‘B’ Seal Exhaust lines
- Suction or ‘A’ Seal Feed lines
- Suction or ‘A’ Seal Exhaust lines

2. Dresser seals are installed at both ends of each compressor through visual inspection **or** review of work package documentation.

3. Blowout Preventer (BOP) test connections at both ends of each compressor are isolated or capped/plugged/crimped on the compressor side.

C. **If** preparing an ICT target location containing centrifugal compressors (12 compressors in C-310 cells, 'B' booster, Surge & Waste Booster, P&E pump), **then** ensure the following for each compressor **and** document on CP4-OP-0236-F01, *ICT Preparation Checklist*:

1. The following seal system lines at the compressor bell housings are capped/crimped/plugged on the compressor side:

- Discharge Seal Feed lines
- Discharge Seal Exhaust lines

2. Dresser seal is installed through visual inspection or review of work package documentation.

D. **If** ICT target location contains a sample manifold, **then** ensure the following **and** document on CP4-OP-0236-F01, *ICT Preparation Checklist*:

- Sample manifold heater breaker in back of control panel cabinet is in ON.
- Sample manifold temperature is **between 100°F and 130°F**.
- Instrument duct fan is running.

NOTE:

There are two R-114 systems associated with '000' cells – an 'Even' system and an 'Odd' system. For '00' cells, booster pumps, and P&E pumps, there is only one R-114 system.

6.1.4 **If** ICT target location has associated R-114 system(s), **then** perform the following:

NOTE:

Maintenance processes require that R-114 be removed and an R-114 negative be obtained prior to opening the R-114 system(s). Due to this, NCSE 095 requirements are completed as part of cutting and capping the R-114 system(s).

R-114 systems should be cut and capped directly at the system(s) and also at any connections to adjacent R-114 systems, such as at vacuum test lines.

TSR 5.5.2.9 NCSE 095

A. Ensure associated R-114 system(s) have been cut and capped away from the R-114 distribution system and adjoining R-114 systems by review of work package documentation or visual verification.

B. Ensure associated R-114 system(s) is/are pressured with air to **between 3 and 5 psig** as follows:

1. Ensure R-114 meletron block valve is sealed open.

2. Note pressure reading on the following ICT target location PI(s):

- **If** a 000 cell, **then** ODD R-114 PIPING **and** EVEN R-114 PIPING
- **If** a system other than a 000 cell, **then** R-114 PIPING

3. **If** pressure on PI(s) observed in Step **6.1.4.B.2** is **less than 3 psig**, **then** perform the following:

a) Contact Shift Coordinator to determine that plant air system meets the following requirements and that Utilities is notified of plant air usage:

- Moisture alarm in C-300 is clear
- Plant capacity can support use of air

b) Ensure air hose tagged 'For R-114 System Pressuring Use' and an air hose vent attachment is connected between PURGE AIR CONNECTION and the following R-114 SYSTEM AIR CONNECTION:

- **If** pressuring a 000 cell odd R-114 system, **then** ICT target location ODD system
- **If** pressuring a 000 cell even R-114 system, **then** ICT target location EVEN system
- **If** pressuring a system other than a 000 cell, **then** ICT target location R-114 system

c) Open PURGE AIR SUPPLY VALVE.

d) Ensure secondary pressure regulator PI downstream of R-114 SYSTEM CONNECTION indicates **between 3 and 5 psig**.

- **If** secondary pressure regulator PI is **NOT between 3 and 5 psig**, **then** request FLM contact Maintenance to adjust regulator.

e) Open the following R-114 SYSTEM AIR ISOLATION VALVE **until** the following R-114 PIPING PI indicates **between 3 and 5 psig**, **then** close the following R-114 SYSTEM AIR ISOLATION VALVE:

- **If** pressuring a 000 cell odd R-114 system, **then** ICT target location ODD system
- **If** pressuring a 000 cell even R-114 system, **then** ICT target location EVEN system
- **If** pressuring a system other than a 000 cell, **then** ICT target location R-114 system

f) Close PURGE AIR SUPPLY VALVE.

g) **If** directed by FLM, **then** disconnect air hose from PURGE AIR CONNECTION and R-114 SYSTEM AIR CONNECTION as follows:

1) Open vent valve on air hose.

2) **When** air is no longer issuing from vent (as determined by audible indications and/or feel), close vent valve on air hose.

3) Disconnect air hose and air hose vent attachment between PURGE AIR CONNECTION and R-114 SYSTEM AIR CONNECTION **and** cap/plug air hose and connections.

4. **If** pressure on PI(s) observed in Step **6.1.4.B.2** is **greater than 5 psig**, **then** open the following R-114 SYSTEM VENT VALVE **until** the following R-114 PIPING PI indicates **between 3 and 5 psig**, **then** close the following R-114 SYSTEM VENT VALVE:

- **If** venting a 000 cell odd R-114 system, **then** ICT target location ODD system
- **If** venting a 000 cell even R-114 system, **then** ICT target location EVEN system
- **If** venting a system other than a 000 cell, **then** ICT target location R-114 system

C. **If** the following associated R-114 system(s) drain valve(s) is/are inside the R-114 system(s) cut and cap boundaries, **then** ensure drain valve(s) is/are open:

- **If** a 000 cell, **then** ODD R-114 DRAIN and EVEN R-114 DRAIN valves
- **If** a system other than a 000 cell, **then** R-114 DRAIN valve

D. Document preparing R-114 system for ICT on CP4-OP-0236-F01, *ICT Preparation Checklist*.

NOTE:

Motor operated block valve (MOV) buffer panels supplying the ICT target location can be determined from labels on the motor operated block valve buffer panel.

6.1.5 Ensure buffer systems to ICT target location are lined up according to CP4-OP-0112, *Operation of Cascade Buffer Systems* **and** document on CP4-OP-0236-F01, *ICT Preparation Checklist*.

6.1.6 Line up headers from F2-U or F2-L, as applicable, to ICT target location as follows:

A. **If** charging to C-335 or C-337, **then** ensure the following valves are closed and caution tagged according to CP3-HS-2008 with tags stating “Do **NOT** Operate – System Isolated for ICT” or similar wording:

- DG-8 in C-310
- 3DG5 in C-331

B. **If** charging to C-310, C-331, or C-333, **then** ensure the following valves are closed and caution tagged according to CP3-HS-2008 with tags stating "Do **NOT** Operate – System Isolated for ICT" or similar wording:

- 3DG-F2 in C-335
- 2DG-F1 in C-335

TSR 5.5.2.4 5.6.5.1

C. Line up headers (including evacuating and leak rating) according to CP4-OP-1121, *Cascade Valve and Leak Rating Operations*.

- Determine with FLM calibrated PI/Pressure Recorder (PR) to be used to monitor header pressure **and** document in Remarks section of CP4-OP-1121-F01, *Valve Line Up Sheet*.

D. Independently verify lineup completed in Step **6.1.6.C**.

E. Ensure boundary isolation valves listed on lineup completed in Step **6.1.6.C** are caution tagged according to CP3-HS-2008 with tags stating "Do Not Operate – System Isolated for ICT" or similar wording.

- **If** any boundary isolation valve is electrically operated, **then** ensure valve breaker is open **and** caution tag breaker. Chg. A

F. Document header to ICT target location isolation on CP4-OP-0236-F01, *ICT Preparation Checklist*.

TSR 5.6.6.1 5.6.8.1

6.1.7 Ensure ICT target location is isolated as follows:

NOTE:

Electrically operated valves should be utilized as designated charging block valves to allow for remote operation and finer control of TG additions.

A. **If** isolating a cell, **then** line up cell according to CP4-OP-0236-F02, *Cell Lineup for ICT Operations*, or according to CP4-OP-1121, *Cascade Valve and Leak Rating Operations*.

- Document on CP4-OP-0236-F02 or in remarks section of CP4-OP-1121-F01, *Valve Line Up Sheet*, the designated charging block valve (valve to be used to allow TG into cell).
- Document on CP4-OP-0236-F02 or in remarks section of CP4-OP-1121-F01, *Valve Line Up Sheet*, the purge valve(s) to be used to pressure ICT target location for long term operations.

B. **If** isolating ICT target locations other than cells, **then** line up according to CP4-OP-1121.

- Document in remarks section of CP4-OP-1121-F01, *Valve Line Up Sheet*, the designated charging block valve (valve to be used to allow TG into ICT target location).
- Document in remarks section of CP4-OP-1121-F01, *Valve Line Up Sheet*, the purge valve(s) to be used to pressure ICT target location for long term operations.

NOTE:

Steps **6.1.7.C** and **6.1.7.D** may be performed in conjunction with each other.

C. Independently verify lineup completed in Step **6.1.7.A** or **6.1.7.B**.

D. Ensure boundary isolation valves listed on lineup completed in Step **6.1.7.A** or **6.1.7.B** are caution tagged according to CP3-HS-2008 with tags stating "Do Not Operate – System Isolated for ICT" or similar wording.

- **If** any boundary isolation valve is electrically operated, **then** ensure valve breaker is open **and** caution tag breaker. Chg. A

E. Document completion of ICT target location isolation on CP4-OP-0236-F01, *ICT Preparation Checklist*.

TSR 5.6.6.1

6.1.8 Ensure an Analytical Test Buggy (ATB) and NaF Trap Cart (NTC) are connected to ICT target location according to the connection section of CP4-OP-0456, *Operation of the Portable Cell Treatment Cart System* **and** document completion on CP4-OP-0236-F01, *ICT Preparation Checklist*.

TSR 5.5.2.10 NCSE 095

6.1.9 Open breakers to cranes with access to cell **and** caution tag according to CP3-HS-2008, *Accident Prevention/Equipment Control Tags* with tags stating "Do **NOT** Operate – System Isolated for ICT" or similar wording.

- Document completion on CP4-OP-0236-F01, *ICT Preparation Checklist*.
- **If** crane operation is required, **then** ensure personnel using crane are notified of ICT target location and that only chokers, slings, or lightweight straps may be carried over the ICT target location.

TSR 5.5.2.10

6.1.10 Tape off access to ICT target location a **minimum of 10 feet** away (cell floor only) using tape identifying treatment in progress and signs that state "Contact Facility Operations for Entry" or similar wording.

- Document completion on CP4-OP-0236-F01, *ICT Preparation Checklist*.
- Stage a minimum of 2 Mine Safety Appliance (MSA) Custom Air V Escape Self-Contained Breathing Apparatus (ESCBA) in different locations at boundary for use in event of emergency exit **and** ensure monthly inspection is current.
- Ensure Industrial Hygiene (IH)/Instrument Maintenance (IM) has placed portable Hydrogen Fluoride (HF) detector(s)at boundary.
- **If** portable HF monitor alarms during operation, **then** take actions according to CP4-OP-0437, *Chlorine Trifluoride, Fluorine, and Mixed Gas Leaks*
- **If** entry is required to the taped off area, **then** ensure **no** transfers of TG to ICT target location **and no** indications of abnormal conditions (see Section **6.4**) exist in ICT target location for duration of entry.

NOTE:

Step **6.1.11** is to be performed any time surge capacity is required to be verified.

One surge capacity can be designated for multiple ICT target locations provided that it meets the most restrictive volume (e.g. surge capacity is met for a '000' cell while also providing for a '00' cell). However, additional surge capacity allows for surge capacity to be met for all other ICT operations if one is used for ICT target location evacuation.

TSR 5.6.7.1 5.6.7.2

6.1.11 Verify a **minimum** of **2** surge capacities are available as follows:

A. Ensure each surge capacity meets the requirements of Appendix B, *Surge Capacity*.

NOTE:

Valve lineup developed in Step **6.1.11.B** does **NOT** need to be performed except during a situation where surge capacity would be needed.

B. Ensure a valve lineup is developed on CP4-OP-1121-F01, *Valve Line-up Sheet*, according to CP4-OP-1121, to align ICT target location to surge capacity.

C. Document verification of surge capacity **and** which surge drum(s) designated on CP4-OP-0236-F01, *ICT Preparation Checklist*.

- **If** performing Step **6.1.11.C** following use of surge capacity, **then** perform documentation requirements on a new CP4-OP-0236-F01 for Step **6.1.11** only.

6.1.12 Leak rate ICT target location as follows:

> NOTE:
>
> ATB and NTC are to be valved in when performing leakrate.

TSR 5.6.6.1 NCSE 095

A. Ensure ATB and NTC are lined up to ICT target location according to ATB and NTC line up sections of CP4-OP-0456, *Operation of the Portable Cell Treatment Cart System*.

> NOTE:
>
> ICT target location pressure should remain above **0.5 psia** to allow for adequate pressure for ATB sampling to be performed.

TSR 5.6.6.1 5.6.8.2 NCSE 095

B. Ensure ICT target location pressure is evacuated **less than 1.0 psia** as read on PI-07.

TSR 5.6.6.1 NCSE 095

C. Monitor ICT target location pressure on PI-07 and PIT-03 (including indication on Human Machine Interface (HMI) for a **minimum** of **two hours**.

> NOTE:
>
> Buffers are normally aligned to the ICT target location during ICT activities. However, individual component buffers identified to be leaking may be isolated according to CP4-OP-0112 to obtain a satisfactory leakrate.
>
> Every attempt should be made to achieve the lowest possible leak rate. This will minimize the inleakage during long term treatment operations, thereby reducing the consumption of ClF_3 and maximizing the time between required actions to evacuate the ICT target location to keep it below the TSR pressure limit (14.3 psia as read on PI-07). Even with a 0.01 psi/hr leak rate, a 000 cell will have to have pressure reduced every 11 days.

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D. Confirm pressure has risen **less than 0.5 psia** on PI-07 during the **two hour** leakrate.

- **If** pressure rise is **greater than 0.01 psia** on PIT-03 indications, **then** notify PSS and SME.

E. Close the following valves on ATB and NTC:

- GL-01 on NTC
- GL-02 on NTC
- V-102 on ATB
- V-103 on ATB

F. Document completion of satisfactory leak rate on CP4-OP-0236-F01, *ICT Preparation Checklist*.

6.2 ICT Startup

<u>Facility Operations Personnel</u>

6.2.1 Ensure CP4-OP-0236-F01, *ICT Preparation Checklist*, has been completed **and** forward to PSS.

- Maintain a copy of CP4-OP-0236-F01 for reference in building where ICT is being performed.

6.2.2 **If** ICT target location pressure is **less than 0.3 psia** as indicated on PI-07, **then** perform the following:

A. Contact Shift Coordinator to determine that plant air system meets the following requirements and that Utilities is notified of plant air usage:

- Moisture alarm in C-300 is clear
- Plant capacity can support use of air

B. Pressure ICT target location to **between 0.3 and 0.5 psia** as directed by FLM using purge valve(s) identified in Step **6.1.7.A** or **6.1.7.B**.

Chg. A

6.2.3 Using sample pump on ATB, sample ICT target location for baseline gas concentrations from the following locations according to CP4-OP-0456, *Operation of the Portable Cell Treatment Cart System* **and** document on CP4-OP-0236-F04, *ICT Data Sheet*:

- **If** a ‘000’ cell, **then** from Stage 4 (or closest available stage)
- **If** a ‘00’ cell, **then** from Stage 5 (or closest available stage)
- **If** other than a ‘000’ or ’00’ cell, **then** from ATB supply line

6.2.4 Record ICT target location pressure and temperatures on CP4-OP-0236-F04, *ICT Data Sheet* and at **least** every **4 hours** thereafter.

6.2.5 Document the following on CP4-OP-0236-F05, *ICT Auxiliary Checksheet*, and at the following frequency:

A. At least every 4 hours:

- R-114 system pressure(s) associated with ICT target location
- **If** ICT target location contains a sample manifold, **then** sample manifold and duct fan check
- ATB purge pump check

B. At least shiftly:

- ICT target location buffer flows
- Heater checks conducted according to Step **6.1.2.I**

NOTE:

Attempts should be made to heat ICT target location piping/components as close as possible to a target of **120°F**.

6.2.6 Ensure available ICT target location temperature points on trendicator and/or ADP are between **60°F** and **150°F**.

WARNING:

Mode ICT will be entered upon completion of Step **6.2.7.B**. A TSR violation may occur if all requirements are **NOT** met **before** performance of this step.

6.2.7 Contact PSS to perform the following:

A. Confirm the following:

TSR 5.3

TSR 3.3.1

TSR 3.2.2

- Technical Safety Requirement (TSR) Minimum Staffing requirements are met
- PI-07 on ATB connected to ICT target location is operable
- Building is in OPERATIONS mode
- HPFW system(s) covering ICT target location are operable

B. Request to enter Mode ICT for ICT target location.

NOTE:

A dry air test may be performed to confirm the lineup for ICT is correct and as a dry run for the TG charging evolution. It may also be performed to demonstrate the ICT process. The dry air test/demonstration is accomplished by charging air from C-350 into the header and ICT target location.

6.2.8 **If** desired to perform a dry air test/demonstration, **then** perform the following: Chg. A

A. Confirm with PSS permission received to conduct dry air test/demonstration.

B. Lineup C-350 to supply air to West MG header according to CP4-OP-0442, *Handling and Storage of Chlorine Trifluoride, Fluorine, and Mixed Gases in C-350*.

C. Remove caution tag(s) from ICT target location designated charging block valve identified on CP4-OP-0236-F02 or Remarks section of CP4-OP-1121-F01 performed in Step **6.1.7.A** or **6.1.7.B**, according to CP3-HS-2008, *Accident Prevention/Equipment Control Tags*.

- **If** designated charging block valve has a remote operating device (such as a control switch), **then** close valve breaker **and** remove caution tags from all operating components (valve handwheel, breaker). Chg. A

D. Contact Shift Coordinator to determine that plant air system meets the following requirements and that Utilities is notified of plant air usage:

- Moisture alarm in C-300 is clear
- Plant capacity can support use of air

E. Charge header to ICT target location to **between 7.0 and 9.0 psia** as indicated on header PI/PR identified in Remarks section of CP4-OP-1121-F01 performed in Step **6.1.6.C** according to CP4-OP-0445, *Transferring Mixed Gas From C-350 or F2 from C-410 to the Cascade*.

F. Station a qualified individual at ATB to continuously monitor ICT target location pressure on PI-07 during transfer **and** notify FLM **when** stationed.

G. Contact PSS to confirm the following:

- Qualified individual stationed at ATB to continuously monitor ICT target location pressure on PI-07
- Permission received to empty air into ICT target location

H. Under the observation of a second qualified operator **and** with their concurrence, perform the following:

1. Slowly open ICT target location designated charging block valve **and** confirm pressure indication on header PI/PR drops **while** qualified individual stationed at ATB confirms ICT target location PI-07 indication rises.

- **If** pressure indication on header PI/PR does **NOT** drop **or** ICT target location PI-07 indication does **NOT** rise, **then** close designated charging block valve **and** notify FLM.

2. **When** pressure indication on header PI/PR stabilizes, **then** close ICT target location designated charging block valve.

I. **If** desired to discontinue stationed monitor at ATB, **then** contact PSS to request to discontinue stationed monitor at ATB.

J. **If** directed by FLM, **then** initiate recirculation operations through the ATB only (NTC isolated) according to CP4-OP-0456.

K. Record ICT target location pressure and temperatures on CP4-OP-0236-F04, *ICT Data Sheet* and at **least** every **4 hours** thereafter.

L. **If** directed by FLM to perform sampling, **then** sample ICT target location according to CP4-OP-0456 **and** document results on CP4-OP-0236-F04, *ICT Data Sheet*. Chg. A

M. **If** continuing to demonstrate the ICT process with air, **then** go to Section **6.3**.

NOTE:

DOE permission is required **prior** to performance of Steps **6.2.9** through **6.2.18**.

6.2.9 Ensure a MG tank is placed in service in C-350 according to CP4-OP-0442, *Handling and Storage of Chlorine Trifluoride, Fluorine, and Mixed Gases in C-350*.

6.2.10 Ensure caution tag is removed from ICT target location designated charging block valve identified on CP4-OP-0236-F02 or Remarks section of CP4-OP-1121-F01 performed in Step **6.1.7.A** or **6.1.7.B**, as applicable, according to CP3-HS-2008, *Accident Prevention/Equipment Control Tags*.

- **If** designated charging block valve has a remote operating device (such as a control switch), **then** close valve breaker **and** remove caution tags from all operating components (such as from valve handwheel, breaker). Chg. A

6.2.11 **If** at any time any of the following indications of an abnormal condition occur, **then** go to the applicable step in Section **6.4**.

- A detonation is heard or felt – Step **6.4.1**.
- An increase of **greater than 10°F per minute** in ICT target location temperature at any point – Step **6.4.2**.
- An increase of **greater than 0.5 psia** in ICT target location pressure **NOT** attributable to pressuring ICT target location with air – Step **6.4.2**.
- CF_4 concentrations **greater than 5%** are observed – Step **6.4.3**.
- R-114 concentrations **greater than 2.5%** are observed – Step **6.4.4**.
- ClO_3F concentrations **greater than 5%** are observed – Step **6.4.5**.

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- ICT target location pressure is **greater than 14.0 psia** as read on PI-07 – Step **6.4.6**.
- Any ICT target location temperature point is **greater than 150°F** – Step **6.4.7**.
- R-114 system pressure is **less than 3.0 psig or greater than 5.0 psig** – Step **6.4.8 or 6.4.9**.
- Any ICT target location temperature point is **less than 60°F** – Step **6.4.10**.

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- PI-07 becomes inoperable – Step **6.4.12**.
- The ATB is **NOT** functioning – Step **6.4.13**.

NOTE:

Typically the SME will give direction through the FLM as to the amount of TG to be charged to the header to the ICT target location.

Maintaining a minimum pressure differential of **0.5 psia** between pressure in headers aligned to ICT target location and TG tank pressure will prevent any possible backfeed from the headers to the C-350 building. This pressure differential may be approached during requests for larger charges of TG (such as for 000 cells).

During first charge of ICT activities, header contents should be slowly emptied to ICT target location in smaller pressure drops (e.g. **0.2 to 0.5 psia**). This will help to minimize effects from adverse reactions or unfavorable conditions upon initial charge. Slow emptying of contents is accomplished by initially opening designated charging block valve in small increments (a second or less for a motor operated valve) and closing designated charging block valve when desired pressure drop is achieved. As header pressure approaches ICT target location pressure, designated charging block valve may be opened more to achieve rate of emptying.

6.2.12 Charge TG to the ICT target location using CP4-OP-0236-F07, *TG Charging Checklist*.

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6.2.13 Record ICT target location pressure and temperatures on CP4-OP-0236-F04, *ICT Data Sheet* after charge and at **least** every **4 hours** thereafter.

6.2.14 **If** ATB recirculation pumps are **NOT** running, **then** initiate recirculation operations through the ATB only (NTC isolated) according to CP4-OP-0456, *Operation of the Portable Cell Treatment Cart System*.

NOTE:

Typically, cell stage samples are obtained from the hi side point. The A-suction side may be used if the hi side is not available (such as due to being plugged).

Additional samples may be obtained according to CP4-OP-0436 as directed by the FLM.

6.2.15 **If** performing ICT on a cell, **then** perform the following:

A. Sample from available stage closest to the designated charging block valve (typically stage 8 in '000' cells and stage 10 in '00' cells) according to CP4-OP-0456 **and** document results on CP4-OP-0236-F04, *ICT Data Sheet*.

B. **If** ClF_3 concentration is **less than 1.0%**, **then** go to Step **6.2.12**.

C. Sample from available stage closest to the middle of the cell (typically stage 4 in '000' cells and stage 5 in '00' cells) according to CP4-OP-0456 **and** document results on CP4-OP-0236-F04, *ICT Data Sheet*.

D. **If** ClF_3 concentration is **less than 1.0%**, **then** go to Step **6.2.12**.

E. Sample from available stage farthest from the designated charging block valve (typically stage 1) according to CP4-OP-0456 **and** document results on CP4-OP-0236-F04, *ICT Data Sheet*.

F. **If** ClF_3 concentration is **less than 1.0%**, **then** go to Step **6.2.12**.

6.2.16 **If** performing ICT on an ICT target location other than a cell, **then** perform the following:

A. Sample from available sample point closest to designated charging block valve (typically supply to NTC line) according to CP4-OP-0456 **and** document results on CP4-OP-0236-F04, *ICT Data Sheet*.

B. **If** ClF_3 concentration is **less than 1.0%**, **then** go to Step **6.2.12**.

C. **If** another sample point is available (preferably at the farthest point from the designated charging block valve), **then** perform the following:

1. Sample from location according to CP4-OP-0456 **and** document results on CP4-OP-0236-F04, *ICT Data Sheet*.

2. **If** ClF_3 concentration is **less than 1.0%**, **then** go to Step **6.2.12**.

6.2.17 **If** desired to discontinue stationed monitor at ATB, **then** contact PSS to request permission to discontinue stationed monitor.

6.2.18 **If** directed by FLM to charge more TG to ICT target location, **then** perform the following:

NOTE:

Maintaining a minimum pressure differential of **0.5 psia** between pressure in headers aligned to ICT target location and TG tank pressure will prevent any possible backfeed from the headers back to the C-350 building. This pressure differential may be approached during requests for larger charges of TG (for 000 cells) with higher header pressures following multiple charges of TG.

A. Charge TG to the ICT target location using CP4-OP-0236-F07, *TG Charging Checklist*.

B. Perform the following after charge and at **least** every **4 hours** thereafter:

NOTE:

ICT target location is normally sampled from the ATB supply, however other sample locations may be used for ICT target location as requested through the FLM by the SME.

1. Sample ICT target location at location directed by FLM according to CP4-OP-0456 **and** document results on CP4-OP-0236-F04, *ICT Data Sheet*.

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2. Record ICT target location pressure and temperatures on CP4-OP-0236-F04, *ICT Data Sheet*.

C. **If** directed by FLM to charge more TG to ICT target location, **then** repeat Steps **6.2.18.A** and **6.2.18.B**.

6.3 ICT Long-Term Treatment

Facility Operations Personnel

6.3.1 **If** at any time any of the following indications of an abnormal reaction occur, **then** go to the applicable step in Section **6.4**.

- A detonation is heard or felt – Step **6.4.1**.
- An increase of **greater than 10°F per minute** in ICT target location temperature at any point – Step **6.4.2**.
- An increase of **greater than 0.5 psia** in ICT target location pressure **NOT** attributable to pressuring ICT target location with air – Step **6.4.2**.
- CF_4 concentrations **greater than 5%** are observed – Step **6.4.3**.
- R-114 concentrations **greater than 2.5%** are observed – Step **6.4.4**.
- ClO_3F concentrations **greater than 5%** are observed – Step **6.4.5**.

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- ICT target location pressure is **greater than 14.0 psia** as read on PI-07 – Step **6.4.6**.
- Any ICT target location temperature point is **greater than 150°F** – Step **6.4.7**.
- R-114 system pressure is **less than 3.0 psig or greater than 5.0 psig** – Step **6.4.8 or 6.4.9**.
- Any ICT target location temperature point is **less than 60°F** – Step **6.4.10**.
- ClF_3 concentration falls **below 0.3%** (**NOT** applicable to dry air demonstrations) – Step **6.4.11**. Chg. A

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- PI-07 becomes inoperable – Step **6.4.12**.
- The ATB is **NOT** functioning – Step **6.4.13**.

NOTE:

Air from C-350 is used to batch purge the header contents to the ICT target location for cleanup of the header.

6.3.2 Ensure C-350 is lined up to supply air to West MG header according to CP4-OP-0442, *Handling and Storage of Chlorine Trifluoride, Fluorine, and Mixed Gases in C-350*.

6.3.3 Contact Shift Coordinator to determine that plant air system meets the following requirements and that Utilities is notified of plant air usage:

- Moisture alarm in C-300 is clear
- Plant capacity can support use of air

6.3.4 Charge header to ICT target location to **between 10.0 and 12.0 psia** as indicated on header PI/PR identified in Remarks section of CP4-OP-1121-F01 performed in Step **6.1.6.C** according to CP4-OP-0445, *Transferring Mixed Gas From C-350 or F2 from C-410 to the Cascade*. Chg. A

TSR 5.6.8.4

6.3.5 Ensure a qualified individual is stationed to continuously monitor ICT target location pressure on PI-07 during transfer **and** that FLM is notified **when** stationed.

6.3.6 Contact PSS to confirm the following:

- Qualified individual stationed at ATB to continuously monitor ICT target location pressure on PI-07
- Permission received to empty TG/air into ICT target location

6.3.7 Under the observation of a second qualified operator and with their concurrence, perform the following:

TSR 5.6.5.2 5.6.8.4

A. Crack open ICT target location designated charging block valve as necessary to slowly empty header to ICT target location **and** confirm pressure indication on header PI drops **while** qualified individual stationed at ATB confirms ICT target location PI-07 indication rises.

- **If** pressure indication on header PI/PR does **NOT** drop **or** ICT target location PI-07 indication does **NOT** rise, **then** close designated charging block valve **and** notify FLM.

B. **When** pressure indication on header PI stabilizes, **then** close ICT target location designated charging block valve.

6.3.8 **If** desired to discontinue stationed monitor at ATB, **then** contact PSS to request permission to discontinue stationed monitor.

6.3.9 Repeat Steps **6.3.4** through **6.3.8** a **minimum** of **5 times**.

6.3.10 Contact Shift Coordinator to determine that plant air system meets the following requirements and that Utilities is notified of plant air usage:

- Moisture alarm in C-300 is clear
- Plant capacity can support use of air

NOTE:

Guidance for ICT target location pressure in long term operations is given to the FLM from the SME. Typically, an ICT target location is pressured to **between 13.0** and **13.6 psia** for further accomplishment of ICT activities. Actual desired value however, may be different based on a multitude of factors such as ICT target location concentrations, leak rate, or operating experience.

6.3.11 Pressure ICT target location as directed by FLM using purge valve(s) identified in Step **6.1.7.A** or **6.1.7.B**.

6.3.12 Perform the following after pressuring ICT target location with air and at **least** every **4 hours** thereafter:

NOTE:

ICT target location is normally sampled from the ATB supply, however other sample locations may be used for ICT target location as requested through the FLM by the SME.

A. Sample ICT target location at location directed by FLM according to CP4-OP-0456, *Operation of the Portable Cell Treatment Cart System* **and** document results on CP4-OP-0236-F04, *ICT Data Sheet*.

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B. Record ICT target location pressure and temperatures on CP4-OP-0236-F04, *ICT Data Sheet*.

NOTE:

Steps **6.3.13** through **6.3.14** may be performed in any order/concurrently.

6.3.13 Rehang caution tag on ICT target location designated charging block valve according to CP3-HS-2008, *Accident Prevention/Equipment Control Tags*.

- **If** designated charging block valve has a remote operating device (such as a control switch), **then** open valve breaker **and** rehang caution tags on all operating components (such as from valve handwheel, breaker). Chg. A

6.3.14 Perform the following according to CP4-OP-0456:

A. Ensure NTC is lined up for operation.

B. Initiate recirculation activities through the ATB and NTC.

NOTE:

Steps **6.3.15** through **6.3.17** may be performed in any order/concurrently.

6.3.15 Perform the following after pressuring ICT target location with air and at **least** twice per week thereafter:

A. Request Laboratory personnel sample ICT target location for the following:

- F_2
- Cl_2

B. Document/track sampling on CP4-OP-0236-F06, *ICT Laboratory Sample Results Data Sheet*.

6.3.16 Isolate header to ICT target location according to CP4-OP-1121, *Cascade Valve and Leak Rating Operations*, **and** remove caution tags from boundary isolation valve components according to CP3-HS-2008, *Accident Prevention/Equipment Control Tags*.

6.3.17 Isolate air to West MG header according to CP4-OP-0442, *Handling and Storage of Chlorine Trifluoride, Fluorine, and Mixed Gases in C-350*.

6.4 Abnormal Conditions

<u>Facility Operations Personnel</u>

6.4.1 **If** a detonation is heard or felt **and** confirmed to be from an ICT target location (based on indications such temperature and/or pressure changes, sprinkler system activation, etc.), **then** perform the following:

A. Clear all personnel from affected area.

B. Notify PSS and FLM.

C. Stop all additions of TG.

D. **When** safe to do so as determined by FLM, **then** go to Section **6.5**.

6.4.2 **If** an abnormal reaction is indicated by an increase of **greater than 10°F per minute** in ICT target location temperature at any point **or** increase of **0.5 psia** in ICT target location pressure **NOT** attributable to charging of TG or pressuring with air, **then** perform the following:

A. Clear all personnel from affected area.

B. Notify PSS and FLM.

C. Stop all additions of TG.

NOTE:

Based on evaluation of data obtained from ICT target location, SME will provide direction through FLM as to further actions needed to resolve effects of reaction.

D. Contact FLM for further instructions.

- **If** desired to stop ICT, **then** go to Section **6.5**.
- **If** ICT target location is evacuated to a designated surge capacity, **then** confirm requirements of Step **6.1.11** are met for all ICT target locations in ICT mode.

TSR 5.6.7.2

6.4.3 **If** CF_4 concentrations **greater than 5%** are observed, **then** perform the following:

A. Notify FLM and PSS.

B. Closely monitor ICT target location temperatures, pressure, **and** CF_4 concentration.

NOTE:

Based on evaluation of data obtained from ICT target location, SME will provide direction through FLM as to further actions needed to resolve high CF_4 concentration.

C. Contact FLM for further instructions.

- **If** desired to stop ICT, **then** go to Section **6.5**.
- **If** ICT target location is evacuated to a designated surge capacity, **then** confirm requirements of Step **6.1.11** are met for all ICT target locations in ICT mode.

TSR 5.6.7.2

6.4.4 **If** R-114 concentrations **greater than 2.5%** are observed, **then** perform the following:

A. Notify FLM and PSS.

B. Closely monitor ICT target location temperatures, pressure, and R-114 concentration.

NOTE:

Based on evaluation of data obtained from ICT target location, SME will provide direction through FLM as to further actions needed to resolve high R-114 concentration.

C. Contact FLM for further instructions.

- **If** desired to stop ICT, **then** go to Section **6.5**.
- **If** ICT target location is evacuated to a designated surge capacity, **then** confirm requirements of Step **6.1.11** are met for all ICT target locations in ICT mode.

TSR 5.6.7.2

6.4.5 **If** ClO_3F concentrations **greater than 5%** are observed, **then** perform the following:

A. Notify FLM and PSS.

B. Closely monitor ICT target location temperatures, pressure, and ClO_3F concentration.

C. **If** any temperature exceeds **150°F**, ICT target location pressure is increasing (indicative of leaking), **and** ClO_3F concentration continues to rise, **then** perform the following:

1. Notify FLM and PSS.

2. Notify all building personnel to stay away from the cell floor area of the ICT target location.

3. **When** ICT target location temperatures are no longer rising, **then** troubleshoot ICT target location for signs of inleakage **and** report to FLM.

NOTE:

Based on evaluation of data obtained from ICT target location, SME will provide direction through FLM as to further actions needed to resolve high ClO_3F concentration.

D. Contact FLM for further instructions.

- **If** desired to stop ICT, **then** go to Section **6.5**.
- **If** ICT target location is evacuated to a designated surge capacity, **then** confirm requirements of Step **6.1.11** are met for all ICT target locations in ICT mode.

TSR 5.6.7.2

6.4.6 **If** ICT target location pressure is **greater than 14.0 psia** as read on PI-07, **then** perform the following:

A. **If** at any time an outgassing of ICT target location contents is observed, **then** clear all personnel from affected area **and** notify PSS.

B. Notify PSS and FLM.

C. Closely monitor ICT target location pressure on PI-07.

NOTE:

Recirculation pumps on ATB should shutdown automatically due to a trip associated with the PUMP HIGH DISCHARGE PRESSURE alarm.

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D. **If** ICT target location pressure is **greater than 14.3 psia** as read on PI-07, **then** perform the following:

1. Ensure recirculation pump(s) on ATB are shutdown according to CP4-OP-0456.

2. **If** ICT target location pressure remains **greater than 14.3 psia** as read on PI-07, **then** evacuate ICT target location to surge drums according to CP4-OP-0436, *Operation of Surge Drums*, to reduce pressure **less than 14.0 psia** as read on PI-07.

- **If** ICT target location can **NOT** be evacuated **less than or equal to 14.3 psia or** ICT target location indicates leak rate has increased to **greater than 0.1 psi/hr**, **then** contact PSS for further guidance.

3. Notify Nuclear Criticality Safety (NCS).

E. **If** ICT target location pressure is **less than or equal to 14.3 psia but greater than 14.0 psia** as read on PI-07, **then** adjust ICT target location pressure as directed by FLM.

F. **If** ICT target location has been returned to **less than 14.0 psia** as indicated on PI-07, **then** perform the following:

1. Resume normal monitoring of ICT target location pressure.

2. Contact FLM for further instructions.

- **If** desired to stop ICT, **then** go to Section **6.5**.

TSR 5.6.7.2

- **If** ICT target location is evacuated to a designated surge capacity, **then** confirm requirements of Step **6.1.11** are met for all ICT target locations in ICT mode.

6.4.7 **If** any ICT target location temperature point is **greater than 150°F, then** perform the following:

A. Notify FLM and PSS.

B. Closely monitor ICT target location temperatures and pressure.

C. **If** any temperature point continues to rise **greater than 10°F per minute**, **then** go to Step **6.4.2**.

D. **If** ICT target location temperatures are no longer rising **and** temperatures are **less than or equal to 200°F**, **then** perform the following:

1. Resume normal monitoring of ICT target location temperatures and pressure.

2. Contact FLM for further instructions.

- **If** desired to stop ICT, **then** go to Section **6.5**.
- **If** ICT target location is evacuated to a designated surge capacity, **then** confirm requirements of Step **6.1.11** are met for ICT target locations in ICT mode.

TSR 5.6.7.2

6.4.8 **If** an R-114 system pressure is **less than 3.0 psig**, **then** perform the following:

A. **If** R-114 system pressure can **NOT** be maintained **greater than or equal to 3.0 psig**, **or** restoring R-114 system pressure on a frequent basis (such as more than **3** times per shift), **then** contact FLM for further instructions.

B. Contact Shift Coordinator to determine that plant air system meets the following requirements and that Utilities is notified of plant air usage:

- Moisture alarm in C-300 is clear
- Plant capacity can support use of air

C. Ensure air hose tagged 'For R-114 System Pressuring Use' and an air hose vent attachment is connected between PURGE AIR CONNECTION and the following R-114 SYSTEM AIR CONNECTION:

- **If** pressuring a 000 cell odd R-114 system, **then** ICT target location ODD system
- **If** pressuring a 000 cell even R-114 system, **then** ICT target location EVEN system
- **If** pressuring an F/S, **then** ICT target location F/S R-114 system
- **If** pressuring a system other than an F/S or 000 cell, **then** ICT target location R-114 system

D. Open PURGE AIR SUPPLY VALVE.

E. Ensure secondary pressure regulator PI downstream of R-114 SYSTEM CONNECTION indicates **between 3 and 5 psig**.

- **If** secondary pressure regulator PI is **NOT between 3 and 5 psig**, **then** request FLM contact Maintenance to adjust regulator.

F. Open the following R-114 SYSTEM AIR ISOLATION VALVE **until** the following R-114 PIPING PI indicates **between 3 and 5 psig**, **then** close the following R-114 SYSTEM AIR ISOLATION VALVE:

- **If** pressuring a 000 cell odd R-114 system, **then** ICT target location ODD system
- **If** pressuring a 000 cell even R-114 system, **then** ICT target location EVEN system
- **If** pressuring an F/S, **then** ICT target location F/S R-114 system
- **If** pressuring a system other than an F/S or 000 cell, **then** ICT target location R-114 system

G. Close PURGE AIR SUPPLY VALVE.

H. **If** directed by FLM, **then** disconnect air hose between PURGE AIR CONNECTION and R-114 SYSTEM AIR CONNECTION as follows:

1. Open vent valve on air hose.

2. **When** air is no longer issuing from vent (as determined by audible indications and/or feel), **then** close vent valve on air hose.

3. Disconnect air hose and air hose vent attachment from PURGE AIR CONNECTION and R-114 SYSTEM AIR CONNECTION **and** cap/plug air hose and connections.

6.4.9 **If** R-114 system pressure is **greater than 5.0 psig**, **then** open the following R-114 SYSTEM VENT VALVE **until** the following R-114 PIPING PI indicates **between 3 and 5 psig**, **then** close the following R-114 SYSTEM VENT VALVE:

- **If** venting a 000 cell odd R-114 system, **then** ICT target location ODD system
- **If** venting a 000 cell even R-114 system, **then** ICT target location EVEN system
- **If** venting an F/S, **then** ICT target location F/S R-114 system
- **If** venting a system other than an F/S or 000 cell, **then** ICT target location R-114 system

6.4.10 **If** any stage temperature is **less than 60°F**, **then** perform the following:

A. Notify FLM and PSS.

B. Check status of heaters at ICT target location housing **and** notify FLM for Maintenance assistance with heater(s) found off.

- **If** cause of low temperature was due to failed heater and heater has been repaired/replaced, **then** ensure temperature is restored **greater than or equal to 60°F and** exit this section.

C. Obtain sample from locations with readings **below 60°F** according to CP4-OP-0456, *Operation of the Portable Cell Treatment Cart System.*

D. **If** UF_6 concentration is **greater than 5.0%**, **then** calculate partial pressure as follows:

- (UF_6 concentration ÷ 100) x ICT target location pressure = partial pressure UF_6

E. Using partial pressure calculated in Step**6.4.10.D**, determine if freezeout exists using Appendix C, *UF_6 Phase Diagram*.

F. **If** freezeout is determined to exist, **then** perform the following:

1. Notify FLM and PSS.

2. Evacuate ICT target location to surge drums according to CP4-OP-0436, *Operation of Surge Drums*.

3. Go to Section **6.5**.

G. Determine cause of low temperature and correct, **if** possible.

H. Contact FLM for further instructions.

- **If** desired to stop ICT, **then** go to Section **6.5**.
- **If** ICT target location is evacuated to a designated surge capacity, **then** confirm requirements of Step **6.1.11** are met for ICT target locations in ICT mode.

TSR 5.6.7.2

6.4.11 **If** ClF_3 concentration falls **below 0.3%** during long term treatment activities **and** ICT is **NOT** considered complete (**NOT** applicable to dry air demonstrations), **then** perform the following: Chg. A

A. Notify FLM and PSS.

B. Go to Section **6.5**.

TSR 3.3.1 NCSE 095

6.4.12 **If** PI-07 becomes inoperable, **then** perform the following:

A. Notify PSS and FLM.

B. Stop all transfers of TG to the ICT target location.

C. Trip recirculating pump according to CP4-OP-0456.

D. **If** PI-07 can **NOT** be replaced, **then** replace ATB according to CP4-OP-0456.

E. **If** PI-07 can **NOT** be made operable **within 48 hours**, **then** perform the following:

1. Request Engineering determine equivalent means of pressure monitoring and its associated pressure limit to maintain ICT target location **less than or equal to 14.5 psia**.

2. Observe ICT target location on equivalent means of pressure monitoring at **least every 4 hours** to ensure ICT target location remains less than or equal to maximum allowable TSR pressure value determined by Engineering **and** document on CP4-OP-0236-F04, *ICT Data Sheet*.

F. **If** PI-07 can **NOT** be made operable **within 48 hours and** equivalent pressure monitoring can **NOT** be established **within 60 hours**, **then** perform the following:

1. Line up ICT target location to surge capacity (designated surge drums) according to CP4-OP-0436, *Operation of Surge Drums*.

2. **When** PI-07 is operable, **then** perform the following:

a) Isolate ICT target location from surge capacity according to CP4-OP-0436.

b) Go to Section **6.5**.

G. **If** PI-07 is returned to operable, **then** continue treatment at the direction of the FLM.

6.4.13 **If** ATB malfunctions (e.g. sampling cannot be performed with ATB), **then** perform the following:

A. Notify FLM and PSS.

B. Request IM/Engineering/SME troubleshoot ATB.

C. **If** ATB needs to be replaced, **then** perform the following:

1. Ensure a working ATB has been moved to the applicable location according to CP4-OP-0456.

2. Replace ATB according to CP4-OP-0456.

D. Continue treatment at the direction of the FLM.

6.5 ICT Shutdown

<u>Facility Operations Personnel</u>

6.5.1 Confirm with FLM that ICT long term operations are complete or that ICT Shutdown activities will be performed due to abnormal conditions.

6.5.2 Request Laboratory personnel sample ICT target location for ClF_3 and F_2 concentration **and** document results of combined ClF_3 and F_2 concentrations in FLM log.

6.5.3 **If** ClF_3 and F_2 combined concentration is **less than 8 mole %**, **then** go to Step **6.5.5**.

TSR 5.6.9.1

6.5.4 **If** ClF_3 and F_2 combined concentration is **greater than or equal to 8 mole %**, **then** perform the following:

A. Using formulas in Appendix D, *Calculation to Reduce ICT Target Location Combined ClF_3 and F_2 Concentrations*, calculate amount ICT target location will have to be evacuated and pressured up to reduce concentrations **less than 8 mole %.**

TSR 5.6.7.2

B. Evacuate ICT target location to value calculated in Step **6.5.4.A** to surge drums according to CP4-OP-0436, *Operation of Surge Drums*.

- **If** other ICT operations are in progress, **then** verify surge capacity requirements of Step **6.1.11** continue to be met during evacuation.

C. Pressure ICT target location to pressure calculated in Step **6.5.4.A**.

D. Go to Step **6.5.2**.

6.5.5 Stop trapping operations according to CP4-OP-0456, *Operation of the Portable Cell Treatment Cart System.*

NOTE:

After ICT target location contents are evacuated (below 0.5 psia), temperature monitoring and sampling are no longer required to be performed. However, pressure monitoring is to be continued until PSS has declared ICT target location out of ICT mode.

TSR 5.6.9.2 NCSE 095

6.5.6 Obtain a UF_6 negative on ICT target location (verified by 3 samples on a cell, 2 for all other ICT target locations) according to CP4-OP-1119, *Cell Evacuation*, or CP4-OP-1120, *Obtaining Negatives in Static and Auxiliary Systems*. Chg. A

TSR 5.6.7.2

- **If** TG was charged to ICT target location, **then** obtain UF_6 negative to surge drums.
- **If** other ICT operations are in progress, **then** verify surge capacity requirements of Step **6.1.11** continue to be met during UF_6 negative.
- **When** ICT target location has been evacuated **less than 0.5 psia**, **then** discontinue temperature monitoring and sampling of ICT target location.
- Forward safety sample results to PSS upon completion.

6.5.7 Contact PSS to obtain permission for the following:

- Exit ICT mode for ICT target location
- Discontinue pressure monitoring

6.5.8 Discontinue recording of data on CP4-OP-0456-F05, *ICT Auxiliary Checksheet*.

7.0 ACCEPTANCE CRITERIA

The treatment will be considered complete when review of the ICT target location data indicates that treatment reactions have reached equilibrium **and no** further deposit reduction is taking place. There is no acceptance criteria for dry air demonstrations. Chg. A

8.0 POST PERFORMANCE WORK ACTIVITIES

8.1 Turn off ICT target location housing heaters by positioning power switches to NO HEAT **and** placing 480 VOLTS supply disconnect to the OPEN/OFF position.

8.2 Remove tape restricting access to the ICT target location being treated.

8.3 Pressure ICT target location as directed by CP4-OP-1119, *Cell Evacuation*, or CP4-OP-1120, *Obtaining Negatives in Static and Auxiliary Systems*, as applicable.

8.4 Open the following R-114 SYSTEM VENT VALVE(s) **until** the following R-114 PIPING PI indicates **0 psig**, **then** close the following R-114 SYSTEM VENT VALVE(s):

- **If** venting a 000 cell, **then** ICT target location ODD and EVEN systems
- **If** venting an F/S, **then** ICT target location F/S R-114 system
- **If** venting a system other than an F/S or 000 cell, **then** ICT target location R-114 system
- **If** a 000 cell, **then** ODD **and** EVEN R-114 SYSTEM VENT VALVE
- **If** a system other than a 000 cell, **then** R-114 SYSTEM VENT VALVE
- **If** ICT target location has an associated F/S, **then** F/S R-114 SYSTEM VENT VALVE

8.5 Disconnect NTC and ATB according to CP4-OP-0456, *Operation of the Portable Cell Treatment Cart System*.

9.0 RECORDS

9.1 Records Generated

The following records may be generated by this procedure:

- CP4-OP-0236-F01, *ICT Preparation Checklist*
- CP4-OP-0236-F02, *Cell Lineup for ICT Operations*
- CP4-OP-0236-F03, *TG Amount Tracking Log*
- CP4-OP-0236-F04, *ICT Data Sheet*
- CP4-OP-0236-F05, *ICT Auxiliary Checksheet*
- CP4-OP-0236-F06, *ICT Laboratory Sample Results Data Sheet*
- CP4-OP-0236-F07, *TG Charging Checklist*

9.2 Records Disposition

The records are to be maintained in accordance with CP3-RD-0010, *Records Management Process*.

Appendix A – Acronyms/Definitions

ACRONYMS

ADP – Automatic Data Processing

BOP – Blowout Preventer

DAC – Design Analysis Calculation

ESCBA – Escape Self Contained Breathing Apparatus

FLM – Front Line Manager

F/S – Freezer/Sublimer

HF – Hydrogen Fluoride

HMI – Human Machine Interface

IH – Industrial Hygiene

IM – Instrument Maintenance

JHA – Job Hazard Analysis

MOV – Motor Operated Valve

MSA – Mine Safety Appliance

NCS – Nuclear Criticality Safety

NCSA – Nuclear Criticality Safety Approval

NCSE – Nuclear Criticality Safety Evaluation

P&E – Purge and Evacuation

PI – Pressure Instrument

PIT – Pressure Indicating Transmitter

Chg. A

PR – Pressure Recorder

PSS – Plant Shift Superintendent

SME – Subject Matter Expert

Appendix A – Acronyms/Definitions (Continued)

DEFINITIONS

Analytical Test Buggy (ATB) – Cart which contains an FTIR, a recirculation pump for circulating flow through process equipment and the FTIR sample cell. It is used in conjunction with the NaF Trap Cart (NTC) at FPDP.

Concurrent Verification – A method of checking an operation, an act of positioning, or a calculation in which the verifier independently observes and/or confirms the operation or calculation.

Continuous Monitoring – the process in which someone is present to observe required parameters on a frequent basis. Other activities may be performed in the vicinity provided individual performing monitoring is not required to leave the area.

In Situ Chemical Treatment (ICT) – Chemical process used for performing decontamination activities on process equipment.

ICT Startup – Activities associated with transfer of TG from the header to the ICT target location and circulating TG through the ICT target location.

ICT Long Term Treatment – Activities associated with adding dry air to the ICT target location after TG transfers have been completed and long-term treatment (e.g. trapping UF_6, circulating TG through ICT target location) is in progress.

ICT Shutdown – Activities associated with evacuation of TG from ICT target location and obtaining a UF_6 negative.

Mixed Gas (MG) – Combination of ClF_3 and F_2. This includes the nitrogen component associated with the 20%/80% F_2 mix.

NaF Trap Cart (NTC) – Cart containing NaF traps and NaF trap oven.

Portable Cell Treatment Cart (PCTC) – Refers to the combination of the ATB and the NTC.

Treatment Gas (TG) – Gaseous mixture of ClF_3, F_2, and N_2 used for ICT. MG is an acceptable synonym for TG..

Appendix B – Surge Capacity

Surge drums shall meet the maximum pressure requirements in the following table to be counted as a surge capacity:

Notes:

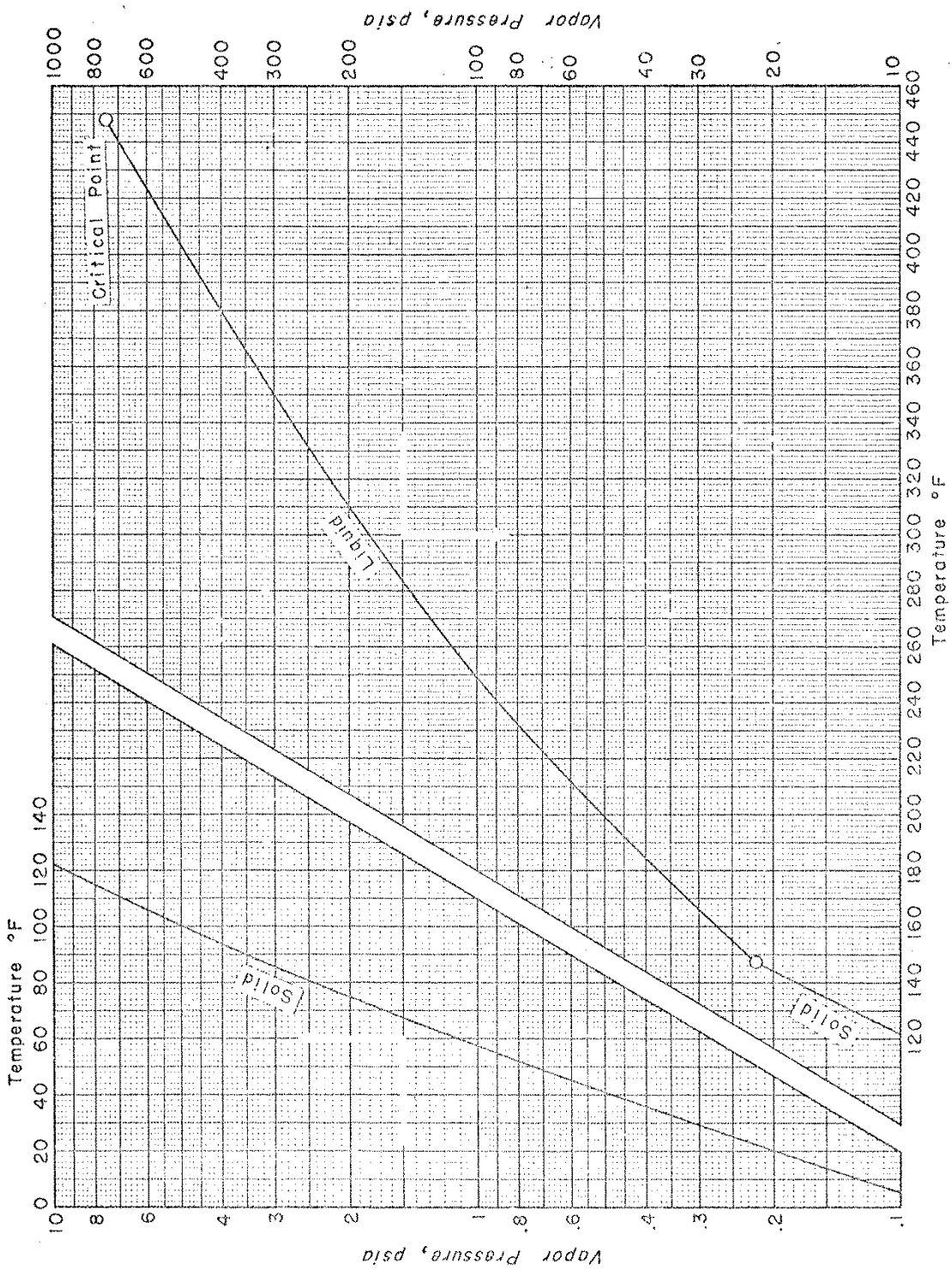
1. For ICT target locations with volumes larger than a 00 cell but smaller or equal to a 000 cell, then use the 000 size requirements
2. For ICT target locations with volumes larger than 2X equipment but smaller or equal to a 00 cell, then use the 00 size requirements
3. For ICT target locations with volumes equal to or less than 2X equipment, then use the 2X size requirement

Surge Drum	Capacity (ft^3)	ICT Target Location Volume		
		000	00	2X
		Maximum Pressure Allowable (psia)		
C-331 'A'	10,000	7	10	10
C-331 'B'	10,000	7	10	10
C-331 'C'	10,000	7	10	10
C-331 'D'	10,000	7	10	10
C-331 'E'	8,000	7	10	10
C-335 'A'	4,000	1	7	10
C-335 'B'	6,000	5	10	10
C-335 'C'	10,000	7	10	10
C-335 'D'	10,000	7	10	10
C-335 'E'	10,000	7	10	10
C-333 or C-337 'A'	10,000	7	10	10
C-333 or C-337 'B'	10,000	7	10	10
C-333 or C-337 'C'	10,000	7	10	10
C-333 or C-337 'D'	10,000	7	10	10
C-333 or C-337 'E'	10,000	7	10	10
C-333 or C-337 'F'	10,000	7	10	10
C-333 or C-337 'G'	10,000	7	10	10
C-333 or C-337 'H'	8,000	7	10	10
C-333 or C-337 'J'	6,000	5	10	10

A combination of surge drums may also be used to meet surge capacity. For these cases, surge drum pressure and volume requirements shall be calculated based on the following table (notes above apply):

ICT Target Location Equipment Size	Surge Capacity Pressure (psia)				
	1	2	5	7	10
	Minimum Surge Capacity volume required (ft^3)				
000	4,000	4,300	5,700	7,200	12,000
00	2,000	2,200	2,900	3,600	6,000
2X	400	500	600	800	1,200

Appendix C – UF6 Phase Diagram



Appendix D - Calculation to Reduce ICT Target Location Combined ClF_3 and F_2 Concentrations

Evacuate and add air to ICT target location to obtain the desired ClF_3 or F_2 concentration according to the following:

$$P2 = (P1 \times C1) / C2$$

Where:

P2 = Final ICT Target Location Pressure After Pressuring With Air

P1 = ICT Target Location Pressure After Evacuation

C1 = Initial ClF_3 and F_2 concentrations

C2 = Final ClF_3 and F_2 concentrations

Example 1 – Determining final pressure required to pressure to in order to reduce concentration

Initial ClF3 concentration = 6%

Initial F2 concentration = 4%

Initial Combined ClF_3 and F_2 concentrations (C1) = 10%

ICT Target Location Pressure After Evacuation (P1) = 3 psia

Desired Combined ClF_3 and F_2 concentration (C2) = 5%

Final ICT Target Location Pressure After Pressuring With Air (P2) = (3 psia x 10%) / 5% = 6 psia

Example 2 – Determining pressure required to evacuate to in order to reduce concentration

Initial ClF_3 concentration = 6%

Initial F_2 concentration = 4%

Initial Combined ClF_3 and F_2 concentration (C1) = 10%

ICT Target Location Pressure After Evacuation (P1) = 3 psia

Final ICT Target Location Pressure After Pressuring With Air (P2) = 13 psia

Rearranging Equation (1)

P2 = (P1 x C1) / C2 becomes (P2 x C2) / C1 = P1

ICT Target Location Pressure After Evacuation (P1) = (13 psia x 5%) / 10% = 6.5 psia

TSR
5.5.2.4
5.5.2.9
5.5.2.10
5.6.5.1
5.6.6.1
5.6.7.1
5.6.8.1
5.6.8.2
NCSA
CAS-001
NCSE
095

CP4-OP-0236-F01 – ICT PREPARATION CHECKLIST

Building: _____ ICT Target Location: _____

Step No.	Requirement	Performer (Print/Sign/Date)
6.1.1	**If** ICT target location is a '00' or '000' cell, **then** temperature/pressure points are checked **and** FLM notified of points that are **NOT** functioning.	
6.1.2	Heaters are positioned at equipment housing as directed by FLM **and** heaters are operating.	
6.1.3.A	**If** preparing a cell which has an associated F/S, **then** F/S system is as follows: • 'A' and 'B' valves are closed and caution tagged • 'A' and 'B' valve breakers are open and caution tagged • R-114 system is cut and capped away from the R-114 distribution system • R-114 system is pressured with air to **between 3 and 5 psig** •	
6.1.3.B	**If** preparing an ICT target location which has axial compressors, **then** compressors are as follows: • 'A' and 'B' end seal feed and seal exhaust system lines at the compressor bell housings are capped/crimped/plugged • Dresser seals are installed at both ends of each compressor • BOP test connections are isolated **or**capped/crimped/plugged	
6.1.3.C	**If** preparing an ICT target location which has centrifugal compressors, **then** compressors are as follows: • Discharge end seal feed and seal exhaust system lines at the compressor bell housings capped/crimped/plugged • Dresser seal is installed	
6.1.3.D	**If** ICT target location has a sample manifold, **then** manifold is as follows: • Cubicle heater is on • Cubicle temperature is **between 100 and 130°F** • Instrument duct fan is running.	
6.1.4	**If** preparing an ICT target location which has an associated R-114 system, **then** R-114 system is as follows: • Cut and capped away from R-114 distribution system • Pressured with air to **between 3 and 5 psig** •	
6.1.5	Buffer systems are lined up to ICT target location.	
6.1.6	Header to ICT target location is lined up according to CP4-OP-1121.	
6.1.7	ICT target location is isolated and boundary isolation devices are caution tagged.	
6.1.8	ATB and NTC are connected to ICT target location.	
6.1.9	Breakers to crane(s) with access to cell open **and** caution tagged.	
6.1.10	Access to ICT target location on cell floor has been taped off a **minimum of 10 feet** away from ICT target location.	
6.1.11	Surge Capacity has been verified. Drums designated: _____	
6.1.12	ICT target location has been leak rated at **less than 1.0 psia** on PI-07 with pressure rise **less than 0.5 psia** on PI-07 during a two hour period (**if** pressure rise is **greater than 0.01 psia** on PIT-03 indications, **then** PSS and SME notified).	
FLM Review (Print/Sign/Date):		
PSS Review (Print/Sign/Date):		

CP4-OP-0236-F02 – CELL LINEUP FOR ICT OPERATIONS

Building:		(Designated by % on lineup)					
Unit:		(Designated by # on lineup)					
Cell:		(Designated by * on lineup)					
Component	Required Position	Operator	Verifier	Component	Required Position	Operator	Verifier
"A" INLET *AB1 Valve	Closed			L.R. VALVES C - % - # - * INLET	Closed		
"A" OUTLET *AB2 Valve	Closed			L.R. VALVES C - % - # - * OUTLET	Closed		
"B" INLET *BB1 Valve	Closed			# – * – S – 1 PURGE	Closed		
"B" OUTLET *BB2 Valve	Closed			# – * – S – 8 PURGE (333 only)	Closed		
#E* Valve	Closed			# – * – S – 10 PURGE (331/335 only)	Closed		
#BE* Valve (if cell 4, 5, 8, or 9)	Closed			S/8 B-LINE CHARGING MANIFOLD BLOCK VALVE	Closed		
RECYCLE *R Valve	Open						
ICT Target Location Designated Charging Block Valve:							
ICT Target Location Purge Valve:							

TSR
5.5.2.4

CP4-OP-0236-F03 – TG AMOUNT TRACKING LOG

Building: _____

Charging			Totals			Evacuation					
Date	Time	Amount	Total in Building (4745 lb. max)	ICT Target Location	Total in ICT Target Location (590 lb. max)	Date	Time	Amount	Surge Drum Bank	Pressure Increase in Surge Drums	Pressure Decrease in Surge Drums

TSR 5.5.2.4

CP4-OP-0236-F03 – TG AMOUNT TRACKING LOG (Continued)

(Instructions Page 1 of 2)

1. Document the amount of TG transferred from C-350 in the 'Amount' column of the 'Charging' section of the form. Add value in 'Amount' column to the 'Total in Building' column. When transferred to ICT target location, document where charged to in the 'ICT Target Location' column **and** add value in 'Amount' column to the 'Total in ICT Target Location' (for same ICT target location) column.
2. Document the amount of TG evacuated from an ICT target location as follows:
   - **If** an ICT target location is purged UF6 negative to the C-310 vent stack, **then** document in the 'Amount' column of the 'Evacuation' section the total amount of TG contained in the ICT target location **and** subtract from the 'Total in ICT Target Location' and 'Total in Building' columns.
   - **If** an ICT target location is purged UF6 negative to surge drums, **then** document the amount of TG evacuated according to the method described below for partial evacuations.
   - **If** only a partial amount of the contents are evacuated from the ICT target location, **then** document the amount of TG evacuated as follows:
     - Divide the total amount of TG in the ICT target location by the pressure in the ICT target location **before** evacuation.
     - Multiply the amount of TG per pound (calculated above) by the value of pressure evacuated from ICT target location.
     - Document the value determined in above calculation in the 'Amount' column of the 'Evacuation' section.
     - **If** ICT target location was evacuated to the C-310 vent stack, **then** subtract value in 'Amount' column from the 'Total in ICT Target Location' and 'Total in Building' columns.
     - **If** ICT target location was evacuated to the building's surge drums, **then** perform the following:
       - Record drum evacuated to in 'Surge Drum Bank' column.
       - Record value of pressure rise in drum due to evacuation in 'Pressure Increase in Surge Drums' column.
       - Subtract value in the 'Amount' column from the 'Total in ICT Target Location' column.
     - **If** ICT target location was evacuated to another building's surge drums, **then** perform the following:
       - Subtract value in 'Amount' column from the 'Total in ICT Target Location' and 'Total in Building' columns.
       - On *TG Amount Tracking Log* for building containing surge drums evacuated to (initiate a new form if one does not exist), perform the following:
         - Record amount of TG evacuated which was calculated above in the 'Amount' column of the 'Charging' section.
         - Record drum used in 'Surge Drum Bank' column.
           - Record value of pressure rise in drum due to evacuation in 'Pressure Increase in Surge Drums' column.
           - Add value in 'Amount' column to 'Total in Building' column.

TSR
5.5.2.4

CP4-OP-0236-F03 – TG AMOUNT TRACKING LOG (Continued)

(Instructions Page 2 of 2)

3. Document the amount of TG evacuated from surge drums as follows:
   - Record surge drum evacuated in ‘Surge Drum Bank’ column.
   - Record value of pressure evacuated from surge drum in ‘Pressure Decrease in Surge Drums’ column.
   - Determine amount of TG in surge drum from ‘Amount’ and ‘Pressure Increase in Surge Drums’ blocks for applicable surge drum.
   - Divide amount of TG in surge drum calculated in previous step by the total pressure in surge drum bank **before** evacuation.
   - Multiply amount of TG per psi in surge drum bank calculated in previous step and multiply by value in ‘Pressure Decrease in Surge Drums’ column.
   - Document value evacuated in ‘Amount’ column of ‘Evacuation’ section **and** subtract from ‘Total in Building’ column.

CP4-OP-0236-F04 – ICT DATA SHEET

Chg. A

Building: _____ ICT Target Location: _____

Date/ Time[Note 1]	Amount TG Charged	Sample Source[Note 2]	Sample Results %							
			CF_4[Note 3]	ClF	ClF_3[Note 3]	ClO_2F	ClO_3F[Note 3]	R-114[Note 3]	$UF_6 \leq 5\%$[Note 4]	$UF_6 > 5\%$[Note 4]

Temperature (as read on trendicator – ADP may be used if trendicator point unavailable)																				Pressure (As read on PI-07)[Note 5]	Performer Initials	Date/ Time[Note 1]
1A	2A	3A	4A	5A	6A	7A	8A	9A	10A	1B	2B	3B	4B	5B	6B	7B	8B	9B	10B			

FLM Review (Print/Sign/Date/Time):
FLM Review (Print/Sign/Date/Time):

Note 1 – To be performed **at least** every **4 hours NOT** to exceed **6 hours** when in ICT mode.

Note 2 – Identify as ATB Supply (S), ATB Return (R), or number of stage sampled.

Note 3 – **If** ClF_3 is **less than 0.3%** (**NOT** applicable to dry air demonstrations); R-114 is **greater than 2.5%**; CF_4 is **greater than 5.0% or** ClO_3F is **greater than 5.0%**, **then** take actions according to CP4-OP-0236.

Note 4 – Both columns are to be recorded. The UF6 >5% reading is only to be considered applicable if the UF6 ≤5% reading is greater than 5%.

Note 5 – Satisfies TSR requirement 4.3.1-1 and NCSE 095. **If** pressure is **greater than 14.0 psia**, **then** take actions according to CP4-OP-0236.

TSR 4.3.1-1 NCSE 095

CP4-OP-0236-F05 – ICT AUXILIARY CHECKSHEET

Building: _____ ICT Target Location: _____

R-114 Pressures (psig) [1]			Sample Manifold and Duct Fan Check [2,3] (✓)	ATB Purge Pump Check[4] (✓)	Buffer Flows (inches water) [5]						Heaters Checked (✓) [6]	Operator Initials	Date/ Time[7]
Odd	Even	F/S			BUFFER FLOW	COMP FLANGE BUFFER FLOW	COMP DISHG & BY-PASS BUFFER	Motor Operated Block Valve					
								A	B	C			

Note 1 – ICT target locations with only one R-114 system should log pressure readings in 'Odd' block. **If** pressure is **less than 3.0 psig or greater than 5.0 psig**, **then** take actions according to CP4-OP-0236.

Note 2 – **If** ICT target location does **NOT** contain a sampling manifold, **then** place an 'N/A' in this block.

Note 3 – **If** sample manifold temperature is **less than 100°F or greater than 130°F**, **or** instrument duct fan is **NOT** running, **then** notify FLM.

Note 4 – **If** pump is noisy, oil is discolored, or a degradation of pump performance is noted, **then** contact FLM for further instructions.

Note 5 – **If** buffer flow increases **greater than 1.0 inch**, **then** notify FLM.

Note 6 – Perform heater checks **and** take necessary actions according to CP4-OP-0236.

Note 7 – To be performed at **least** every **4 hours except** for buffer flows and heater checks, which are performed at least shiftly.

CP4-OP-0236-F06 – ICT LABORATORY SAMPLE RESULTS DATA SHEET

ICT Target Location: _____

F_2 Results (%)	Date/Time[Note 1]	Cl_2 Results (%)	Date/Time[Note 1]

Note 1 – To be performed twice per week.

CP4-OP-0236-F07 – TG CHARGING CHECKLIST

Building: _____ ICT Target Location: _____

Action Step	Performer (Print/Sign/Date)
[TSR 5.5.2.4] Check CP4-OP-0236-F03, *TG Amount Tracking Log*, **and** confirm the following TG limits will **NOT** be exceeded: • Building – **4745 pounds** • ICT target location – **590 pounds**	
[TSR 5.6.5.3] **If** performing an initial charge of TG to ICT target location, **then** notify C-335 Facility Operator that this is initial charge.	
Request header to ICT target location be charged with TG to one of the following according to CP4-OP-0445: • **If** a 000 cell, **then between 5 and 70 pounds** as directed by FLM • **If** a 00 cell, **then between 2 and 30 pounds** as directed by FLM • **If** another type of ICT target location, **then between 1 pound and** value determined from an Engineering calculation specific to the ICT target location as directed by FLM	
[TSR 5.5.2.4] Document transfer to building on CP4-OP-0236-F03, *TG Amount Tracking Log*.	
[TSR 5.6.5.3, 5.6.8.2] **If** performing an initial charge of TG to ICT target location, **then** confirm the following: • A **less than or equal to 5.0 psi** drop in MG tank pressure occurred during transfer as confirmed by C-335 Facility Operator • ICT target location pressure is **less than 2.0 psia** as read on PI-07	
[TSR 5.6.8.4] Ensure a qualified individual is stationed to continuously monitor ICT target location pressure on PI-07 during transfer from header to ICT target location.	
Contact PSS to confirm the following: • Qualified individual stationed at ATB to continuously monitor ICT target location pressure on PI-07 during transfer from header to ICT target location • Permission received to empty TG into ICT target location	
Ensure a **minimum** of **30 minutes** has elapsed since last charge to ICT target location (**NOT** applicable for initial charge).	
[TSR 5.6.5.2, 5.6.8.4] Perform the following using concurrent verification: **1.** Crack open (and close as necessary) ICT target location designated charging block valve to slowly empty header to ICT target location **and** confirm pressure indication on header PI drops **while** qualified individual stationed at ATB confirms ICT target location PI-07 indication rises. • **If** pressure indication on header PI/PR does **NOT** drop **or** ICT target location PI-07 indication does **NOT** rise, **then** close designated charging block valve **and** notify FLM. **2.** **When** pressure indication on header PI stabilizes, close ICT target location designated charging block valve.	Performer (Print/Sign/Date) Concurrent Verifier (Print/Sign/Date)
[TSR 5.5.2.4] Document transfer to ICT target location on CP4-OP-0236-F03.	
If ClF_3 sample results from all ICT target location sample points are **greater than 1.0% and** it is desired to discontinue stationed monitor at ATB, **then** contact PSS to request to discontinue stationed monitor.	
FLM Review (Print/Sign/Date):	
PSS Review (Print/Sign/Date):	