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SOP 65-01

TEMPORARY COLD CHEMICAL SYSTEM NITRIC ACID  
RECEIPT AND DISTRIBUTION

Rev. 0

Approved [Signature]  
Operations Manager

Approved [Signature]  
Cognizant Engineering  
Manager

Date 6/12/89

Date 6/12/89

Approved [Signature] FOR P.A.S.  
Radiation and Safety  
Manager

Approved [Signature]  
Quality Assurance

Date 6-9-89

Date 6/9/88

System Quality Level N

System Safety Class N

The estimated accumulated dose for the work described  
in this document is less than 100 mrem.

WEST VALLEY NUCLEAR SERVICES CO., INC.

May 1989

Prepared by: [Signature] 6-9-89  
D. J. Plpetz

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RECORD OF REVISION

PROCEDURE

If there are changes to the procedure, the revision number increases by one. These changes are indicated in the left margin of the body by an arrow (>) at the beginning of the paragraph that contains a change.

Example:

> The arrow in the margin indicates a change.

Procedure No. SOP 65-01, Rev. 0

Date: May 1989

<u>Rev. No.</u>	<u>Description of Changes</u>	<u>No. of Page</u>	<u>Dated</u>
0	Initial Document	All	05/89

SOP 65-01  
Rev. 0

RECORD OF REVISION (CONTINUATION SHEET)

Rev. No.	Description of Changes	No. of Page	Dated
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TEMPORARY COLD CHEMICAL SYSTEM NITRIC ACID  
RECEIPT AND DISTRIBUTION

REV. 0

1.0 SCOPE

This document covers the receipt of concentrated Nitric Acid at the Temporary Cold Chemical System (TCCS) section of the Vitrification Facility and the transfer to either the Main Mix Tank (65D-03) or the Shim Mix Tank (65D-04) within that facility.

2.0 DEFINITIONS AND ABBREVIATIONS

2.1 Definitions

None

2.2 Abbreviations

HNO<sub>3</sub> - Nitric Acid, for the purposes of this procedure, at a strength of 65 to 70 percent.  
MCC - Motor Control Center  
MSDS - Material Safety Data Sheet  
P/FC - Pressure/Flow Control Valve  
PI - Pressure Indicator  
PSIG - Pounds Per Square Inch Gauge  
Vitops - Vitrification Operations  
VOSS - Vitrification Operations Shift Supervisor

3.0 RESPONSIBILITIES

3.1 Vitops is responsible for implementing this procedure in its entirety.

3.2 Analytical & Process Chemistry is responsible for analyzing the samples taken of each shipment and reporting the results to the VOSS.

3.3 The VOSS is responsible for the supervision of the Vitops in all work. The distribution of the shipping documentation is also a VOSS responsibility.

#### 4.0 TOOLS, EQUIPMENT, COMPONENTS, AND REFERENCES

##### 4.1 Tools

Ordinary hand tools, e.g. wrenches.

##### 4.2 Equipment and Components

4.2.1 Concentrated HNO<sub>3</sub> Storage Tank - 65D-05

4.2.2 Concentrated HNO<sub>3</sub> Pump - 65G-05

4.2.3 Concentrated HNO<sub>3</sub> Batch Meter - 65FQIC-227

4.2.4 Main Mix Tank - 65D-03

4.2.5 Shim Mix Tank - 65D-04

4.2.6 Sample Bottles, non-glass only

4.2.7 Safety Shower(s) in TCCS area

4.2.8 Personal Protective Equipment, as listed in step 6.1

##### 4.3 References

WVDP-011, Industrial Hygiene and Safety Manual

900D-2174, 2175, and 2176

SIP 89-01, TCCS Spill Control

SIP 88-05, TCCS Main Mix Tank

MSDS for Nitric Acid

## 5.0 GENERAL INFORMATION

Nitric acid is received on this site in liquid form at a concentration between 65 and 70 percent. Each shipment for use at the TCCS is unloaded using air pressure in the shipper's tank to transfer the acid into 65D-05.

Each shipment is received on site, sampled, and unloaded. The operator checks and records the indicated level in 65D-05 before each unloading operation to verify sufficient space to receive the shipment. The 65D-05 level is taken after the delivery and recorded. The record of levels and analysis results are kept on file by the VOSS.

The transfer operation must be performed under the constant surveillance of an operator properly dressed to respond to a leak or spill.

OPERATORS SHOULD PERFORM FREQUENT CHECKS ON SYSTEMS THAT ARE TURNED ON OR SHUT DOWN TO ASSURE THAT THE SYSTEM DOES WHAT IS EXPECTED, I.E., WATER FLOWS, PRESSURE RISES, LEVEL INDICATORS CHANGE, ETC. IF THE REQUIRED ACTION THAT IS SUPPOSED TO HAPPEN DOES NOT HAPPEN, (1) STOP - DO NOT ATTEMPT TO PERFORM THE NEXT STEP, (2) SECURE THE SYSTEM IN A SAFE MODE, AND (3) NOTIFY SHIFT SUPERVISOR IMMEDIATELY.

## 6.0 PROCEDURE

CAUTION: THE FITTINGS ON THE TCCS NITRIC ACID LOAD IN VALVE AND THE VENDOR'S DELIVERY HOSE SHOULD MATCH. IF THEY DO NOT MATCH, NOTIFY THE VOSS TO RESOLVE THE PROBLEM.

## 6.1 Personal Protective Equipment

SEE WARNING: Nitric acid is highly corrosive. Review the Nitric Acid MSDS, contact of this liquid with the skin, or eyes can cause burns and severe damage if the contact is prolonged. If contact is made, flush the affected areas for a minimum of 15 minutes with water, and report to your Shift Supervisor and the Site Medical Office.

WARNING: WHEN UNLOADING BULK LIQUID CHEMICALS FROM TANK TRUCKS, THE OPERATOR WILL WEAR A HARD HAT WITH FACE SHIELD, GOGGLES, RUBBER GLOVES, AND GAUNTLET GLOVES, FULL VINYL SUIT AND RUBBER BOOTS. ALL SUIT OPENINGS WILL BE SEALED WITH TAPE. PANTS WILL BE WORN OVER THE BOOTS TO PREVENT SOLUTIONS FROM ENTERING THE BOOTS. THE SAFETY SHOWER WILL BE TESTED PRIOR TO THE TRANSFER, AND A UTILITY WATER HOSE WILL BE AVAILABLE AND FLOWING NEAR THE TANK TRUCK CONNECTION DURING THE TRANSFER.

## 6.2 Tank Truck Sampling

6.2.1 Have the driver open the sample hatch.

6.2.2 Sample the contents of the truck by lowering a poly sample bottle, attached to a stainless steel bottle holder, into the liquid.

6.2.3 When air bubbles stop rising from the bottle, remove the bottle from the liquid. Carefully cap the bottle, using care not to drop the equipment into the tank truck. Do not use any cellulosic materials (e.g. cloth or paper) to wipe the concentrated acid from the bottle or holder. The combination of nitric acid and cellulose create nitrocellulose which will self ignite hours after the contact occurs.

- 6.2.4 Check the exterior of the bottle with pH paper. If the pH paper check does not clearly indicate acid (i.e. pH less than 2), contact the VOSS before proceeding with the unloading. Rinse the bottle and bottle holder with the utility water before using any paper wipes to dry them.
- 6.2.5 Label the sample, place it in a plastic bag, and have it delivered to the Analytical Lab with an Analytical Request Form calling for H+ analysis.

6.3 Unloading Concentrated Nitric Acid to 65D-05

- 6.3.1 Check the amount of Nitric Acid to be received by inspecting the shipping papers. The strength of nitric acid to be delivered will weigh approximately 1.4 kg per litre (648 litres per ton, 32.4 litres per 100 lbs). Check the present level of 65D-05 and log the reading on the shipping papers. Compare the calibration chart volume of 65D-05 to ensure that the delivery will fit in the tank without exceeding 5856 litres (85 percent of overflow volume). If the volume to be received will cause 65D-05 to exceed this level, contact the VOSS. The VOSS can authorize filling to 6200 litres (90 percent of overflow volume).
- 6.3.2 When the step 6.3.1 step requirements are met, establish communication with an observer of the 65D-05 level, and proceed with the transfer (analysis results are not required unless otherwise instructed by the VOSS, the results will be added to the Vitrification Vessel volume by the operator when results are received from the lab). Connect the tank truck unloading hose to the TCCS load in valve flange or quick disconnect and wire tie all camlocks.

Open the TCCS load in valve and have the driver start the transfer. An optional source of air for the transfer will be Utility Air from the TCCS via a pressure regulator set at less than 25 PSIG.

- 6.3.3 If leaks are observed, stop the transfer and control the spill. Do not attempt to retighten the flange bolts on the load in valve unless the pressure is removed from the tank truck. Notify the VOSS if the leak cannot be stopped.
- 6.3.4 If at any time, the high level alarm or the high high level alarm sound, immediately stop the transfer by closing the load in valve and the tank truck discharge valve. The VOSS should be notified at once. Investigation and recovery will require VOSS involvement. (See the last paragraph of 5.0.)
- 6.3.5 Stand up wind of the 65D-05 vent because when the tank truck is empty, air will start to discharge from the vent. Have the driver close the truck delivery valve, and at the same time, close the TCCS nitric acid load in valve. Carefully disconnect the flange or quick disconnect at the load in valve, and catch any drips of acid in a plastic bucket. Replace the blind flange or quick disconnect cap on the TCCS load in valve. Dispose of acid per VOSS instructions.
- 6.3.6 Check the final level in 65D-05 and note on the shipping papers. The VOSS will distribute the shipping papers. Vit Ops is to log the receipt of acid in the Vitrification log, with the level change data from 65D-05 level indicator.

6.4 Transferring Nitric Acid from 65D-05 to the Main Mix Tank 65D-03 or the Shim Mix Tank 65D-04

6.4.1 SEE CAUTION: Feed Mix Work Document will detail the amount of acid to be added, the rate of addition, and the tank which is to receive the acid. The selector valves relating to which tank receives are 65H-733 for the Shim Mix Tank; and 65H-732 for the Main Mix Tank. Both are normally closed. Open the appropriate valve and ensure the valve for the tank not receiving acid is closed, locked, and tagged.

CAUTION: ADDING NITRIC ACID TO EITHER THE MAIN MIX OR THE SHIM TANK WILL REQUIRE COOLING WATER FLOW THROUGH THE TANK JACKET, SEE SOP 65-5. ALSO, BE AWARE THAT WHILE THE NITRIC ACID TANK, THE MAIN MIX TANK AND THE SHIM TANK, ALONG WITH THE PIPING AND THE CROSSLINKED POLYLINE GREEN HOSE ARE SUITABLE FOR CONCENTRATED NITRIC ACID; THE BLACK "COMMANDER" HOSE, THE YELLOW WITH RED STRIPE "TRANSPORTER H" HOSE AND THE ELASTOMER PARTS OF THE DIAPHRAM PUMPS ARE LIMITED TO 25% CONCENTRATION OF NITRIC ACID.

6.4.2 Check that the following valves are closed:

- o 65H-731 - the nitric acid pump inlet flush valve (and capped)
- o 65H-734 - the nitric acid pump discharge flush valve (and capped)
- o 65H-716 - the nitric acid batch autovalve, (operates automatically)

6.4.3 Check that the following valves are open:

- o 65H-729 - the nitric acid pump inlet valve
- o 65H-717 - the nitric acid pump discharge valve
- o 65GL-899 - the nitric acid pump discharge gauge isolation valve
- o 65GL-720 the nitric acid pump recirculation valve, (this valve should be preset at the proper recirculation rate and pressure, when 65G-05 is operating, this valve should be adjusted to give 25 to 27psig on PI-228).

6.4.4 Check that the 65G-05 control on the TCCS control panel is in the off position. Unlock the MCC for 65G-05, close the breaker and set the selector switch to "remote."

6.4.5 Setup the batch programmer by performing the following steps:

1. Press "program."
2. Press "preset" then the desired litres to be transferred (to the 1/10 litre).

Note that the programmed value may be slightly less than the planned delivery due to a known overshoot. The mix plan will detail this. Then press "enter."

Note: If more than 5 seconds elapse between key strokes, the batch controller leaves the program mode. This will require returning to step 1 to restart programming.

3. Reset the counter by pressing "reset" then "counter."  
This should clear the counter (to 0.0 litres).
4. Check the programmed litres by pressing "preset," the  
readout should show the step #2 value and then return to  
zero.
5. Place the TCCS control panel switch for 65G-05 from "off"  
to "auto." See step 6.4.7.
6. Press "start" on the batch programmer and 65G-05 will  
start and 65H-716 will open to deliver the programmed  
volume to the tank selected in step 6.4.1. Check that  
the tank that should be receiving the acid is increasing  
and that the tank that should not is not increasing.
7. During the transfer, the rate may be checked by pressing  
"rate." Increase or decrease the setting of P/FCV-718T  
to bring the rate to the target value listed in the mix  
plan. Press "count" to return to the litres delivered  
readout.
8. When the programmed number of litres is reached, the  
batch programmed will shut down 65G-05 and close  
65H-716. Return the TCCS control panel switch for 65G-05  
to the "off" position.
9. Open the MCC breaker for 65G-05 and lock and tag.

6.4.6 If it is desired to stop the transfer before completion, the following will do so:

1. Emergency Stop - stops the grinder, both agitators, and both the acid and caustic pumps (because of interlocking, only one pump could be running).
2. Batch Controller "stop" - stops the batching and flashes indicating incomplete batch.
3. Turn the 65G-05 selector to "off."

Note: In each of these cases, record the count value for future reference. Contact the VOSS before attempting restart of the batching operation.

6.4.7 When the batch transfer of nitric acid is complete, close the supply valve opened in step 6.4.1 and 65H-717 the nitric acid pump discharge valve.

6.4.8 Log the volume delivered in the mix data sheet.