Approved (With Feedback Comments)

ORNL WORK PLAN

Operations, Maintenance and Services

Work Plan Name / Rev: MWP059107 / 1
Expiration Date: 10/7/2025

59107

WORK SCOPE/DESCRIPTION	
Requester (Name/Badge/Division):	Moore, Andrew / 03022839 / X108
Location of work (Bldg/Rm/Other):	7920 / 120 / Limited Access Area (LAA)
Work Plan Title:	Line repairs at Tank Pit 2 and Tank Pit 6

Description of Service/Work Needed:
This work package addresses the hazards and controls to perform line repair at Tank Pit two and Tank Pit six in the LAA at Building 7920. Entry into these Tank Pits were made to identify leaking lines. Leak testing will be performed following line repair with assistance of 7920 Operations personnel. Movement of Tank Pit shield blocks will be in accordance with NNFD-7920-SR-200 Appendix V and ORNL form-543.

Charge Number, if required:	
Work Plan Grade/Worktype:	1 / F
Author (Name/Badge):	Moore, Andrew / 03022839

File Attachments:

Badge	Name	Attachment Desc	File Name
03022839	Moore, Andrew	Special Work Instructions	'Special Work Instructions' for T-65 and Tank Pit 6 Maintenance Actions.pdf
03022839	Moore, Andrew	USQD	USQD_REDC_24-017_R0 (Final with Digital Signatures) 09-27-2024.pdf
03116541	Carnahan, Corey	QEA	MWP059107 QEA 10.1.24.pdf
03022839	Moore, Andrew	USQD	EUSQD_REDC_24-125_R0 (Final with Signatures) 10-01-2024.pdf
03022839	Moore, Andrew	BOPM	7920-BOPM-452 Tank T-65 and Jumper 38T-T6508 Repair.pdf

INSTRUCTIONS

Prerequisites/Precautions:
-All work performed in, or in support of a Category 1, 2, or 3 Nuclear Facility must be conducted in compliance the facility Safety Analysis Report and Technical Safety Requirements (TSR).

- Is it a physical change. No.
- Is it a change to a procedure or program described in the documented safety analysis or a new procedure? No.
- Is it a new or revised operation? No.

-If yes is the answer to any of the three above questions, then a USQD is to be performed.

-Plan and schedule work with Facility Management and Operations personnel.

Directions:

Post Work Testing:

Closeout:
Add a step to closeout section for Facility Management and Group Lead of post-work testing.

JOB HAZARD EVALUATION

HAZARDS	PERMITS / CONTROLS

Hoisting and Rigging: Movement of Key/Tank Pit Blocks for access to leaking lines.	- Inspections and preventive maintenance is complete:
	  - Initial inspection
	  - Pre-operational inspection
	  - Monthly inspection
	  - Annual/preventive inspection for H&R equipment
	[Formerly Verification of current certification / inspections for H&R equipment]
	- Instructions for Completion of Critical Lift Form (ORNL-543, Critical Lift Plan)
	- Safety shoes
	- Qualified personnel

Radiological Work: Work will be performed in the Limited Access Area	- Radiological Work Permit (Enter RWP no.) - Dosimetry Monitoring Requirements - Follow radiological posting, entry control & egress requirements - Respond to Abnormal Radiological Conditions and Alarms. Radiological alarms include: Continuous Air Monitor (CAM), Area Radiation Monitor (ARM), Electronic Pocket Dosimeter (EPD), Personnel Contamination Monitor (PCM). - Controls as per RWP
Elevated Work: Work above open pit	- Install guardrails with complete top rail and midrail around pit openings to eliminate fall hazard.
Ergonomic Conditions (Contact Stress, Vibration, Posture, Force, Repetitive Motion): Use of long handled aluminum and plastic/fiberglass tools while reaching into 20-30 feet deep pit.	- Exposure Assessment: Enter or attach justification to classify exposure scenario as low risk, qualitative exposure assessment (QEA), or requirement to conduct quantitative exposure monitoring (QEM) - Diversify activities - Stretch breaks/exercises - Worker rotation
Manual Material Handling: Use of long handled tools	- Apply Guideline: Assess Hazards - Diversity of activities - Apply hierarchy of controls approach - Exposure Assessment: Enter or attach justification to classify exposure scenario as low risk, qualitative exposure assessment (QEA), or requirement to conduct quantitative exposure monitoring (QEM)
Chemical/Rec ID 1: RECID 81193 - Clorox Commercial Solutions Formula 409	- Exposure Assessment: Enter or attach justification to classify exposure scenario as low risk, qualitative exposure assessment (QEA), or requirement to conduct quantitative exposure monitoring (QEM) - Administrative controls: use only quantity needed to accomplish task. - Gloves: Specify. Chemical resistant gloves such as natural rubber, nitrile or equivalent - Safety glasses: with side shields - Job Specific Haz Com Training: Follow SDS Requirements
Chemical/Rec ID 2: RECID 82905A - Kroil for loosening rusty or stuck bolts	- Exposure Assessment: Enter or attach justification to classify exposure scenario as low risk, qualitative exposure assessment (QEA), or requirement to conduct quantitative exposure monitoring (QEM) - Administrative controls: use only quantity needed to accomplish task. - Gloves: Specify. Chemical resistant gloves such as natural rubber, nitrile or equivalent - Safety glasses - Job Specific Haz Com Training: Follow SDS Requirements
Chemical/Rec ID 3: RECID 82913 -WD-40 for rusty or stuck bolts	- Exposure Assessment: Enter or attach justification to classify exposure scenario as low risk, qualitative exposure assessment (QEA), or requirement to conduct quantitative exposure monitoring (QEM) - Administrative controls: use only quantity needed to accomplish task. - Gloves: Specify. Chemical resistant gloves such as natural rubber, nitrile or equivalent - Safety glasses: with side shields - Job Specific Haz Com Training: Follow SDS Requirements

Chemical/Rec ID 4: RECID 00275 - Nitric Acid for dissolving nylon string	▪ Exposure Assessment: Enter or attach justification to classify exposure scenario as low risk, qualitative exposure assessment (QEA), or requirement to conduct quantitative exposure monitoring (QEM) ▪ Chemical goggles: If splash/vapor hazard exists ▪ Administrative controls: use only quantity needed to accomplish task. ▪ Gloves: Specify. Neoprene or equivalent ▪ Eyewash/safety shower: Ensure eyewash/safety shower is readily accessible an in functioning order prior to start of work. ▪ Ventilation: Ensure space is well ventilated ▪ Safety glasses: with side shields ▪ Job Specific Haz Com Training
Chemical/Rec ID 5: RECID D7891- Knock'er Loose for rusty/stuck bolts	▪ Exposure Assessment: Enter or attach justification to classify exposure scenario as low risk, qualitative exposure assessment (QEA), or requirement to conduct quantitative exposure monitoring (QEM) ▪ Administrative controls: use only quantity needed to accomplish task. ▪ Gloves: Specify. Chemical resistant gloves such as natural rubber, nitrile or equivalent ▪ Safety glasses: with side shields ▪ Job Specific Haz Com Training: Follow SDS Requirements
Eye Protection	▪ When respiratory protection is not required safety glasses with side shields shall be worn at all times.
Use of hard hats	▪ Hard hats are to be worn when 50/5T crane is in operation.

DOCUMENTATION REVIEW AUTHORIZATION (Approvals are certification of hazards assessment)		
Reviewer/Approver Roles	Signature	Date
Accountable Management (Service Provider, Line, Equipment Owner, or Facility Management)	Schmidlin, Joshua	10/4/2024
Author	Moore, Andrew	10/4/2024
IS/IH	Carnahan, Corey	10/4/2024
Nuclear or Facility Engineer	Keener, Douglas	10/4/2024
Other Subject Matter Experts (SMEs)	Burns, Zachary	10/7/2024
Other Subject Matter Experts (SMEs)	Hinds, Steven Henry	10/4/2024
QA	Chitwood, Greg	10/4/2024
Radiation Protection	Maldonado, Kimberly	10/4/2024
Safety Basis Engineer	Green, Michael A	10/4/2024
System Engineer, Accountable Equipment Owner, or Facility Engineer	Kirkland, Will	10/4/2024
Task Leader	Allison Jr, Thomas	10/4/2024
Work Package Concurrence		
Facility Manager		
Operations Supervisor		
Facility Manager Approval To Start Work		
Facility Manager		
Work Start Authorization		
Task Leader		

Work Acknowledged Complete

Task Leader		

Worker Feedback:

Work Plan Feedback:
In the attached "Special Work Instructions" the line reading: "Old T6508 jumper line: The old T6508 jumper line is in place from Position (25 or 28? I still must look) on the west side of the west line bundle to Nozzle K of T-65." The correct position is 26.

FOR INFORMATION ONLY. WORK RELEASE AND SYSTEM HOLD POINTS

TASK DESCRIPTION	RESOURCES	DUR
[Hold Point] - Ensure the hot cells bank has been placed in Limited Operations Mode per NNFD-7920-OP-126 prior to removal of Tank Pit Shield Blocks. Removal of Tanks Pit Blocks will be removed in accordance with NNFD-7920-SR-200 Appendix V. Ensure handrail has been installed at Tank Pit opening to obtain access to associated tank pit.	Technician	1
[Hold Point] - Ensure building ventilation is maintained with high AJ-111 intake as well as increased COG flow. This configuration ensures as much volume of air moving into tank pit while it is open also ensuring tank pit is at a high vacuum differential to the LAA to ensure air flow is into the pit. This shall be performed prior to block removal. Consult with REDC Engineering Group Lead/Designee and 7920 Operations personnel.	Technician	2

WORK DETAILS - Prerequisites/Precautions

Hazards	Permits/Controls	Resources	Dur
[Hold Point] - 1) - Ensure the hot cells bank has been placed in Limited Operations Mode per NNFD-7920-OP-126 prior to removal of Tank Pit Shield Blocks. Removal of Tanks Pit Blocks will be removed in accordance with NNFD-7920-SR-200 Appendix V. Ensure handrail has been installed at Tank Pit opening to obtain access to associated tank pit.			
Signature: _____		Supervisor Group Leader/Supervisor Technician	1
[Hold Point] - 2) - Ensure building ventilation is maintained with high AJ-111 intake as well as increased COG flow. This configuration ensures as much volume of air moving into tank pit while it is open also ensuring tank pit is at a high vacuum differential to the LAA to ensure air flow is into the pit. This shall be performed prior to block removal. Consult with REDC Engineering Group Lead/Designee and 7920 Operations personnel.			
Signature: _____		Supervisor Engineer Group Leader/Supervisor Technician	2
3) - Ensure the tank pit handrail is in place at all times during work activities. If handrail needs to be relocated at any point while tank pit is open consult with the Task Leader prior to.			
		Supervisor Rigger/Ironworker Technician	3

WORK DETAILS - Directions

Hazards	Permits/Controls	Resources	Dur
1) - Conduct pre-job brief using NNFD-FRM-058 "PRE-JOB-BRIEF" to identify scope of work, hazards, controls, etc. Include input from all personnel involved in performance of task such as appropriate crafts and facility operations personnel.			
		Supervisor DEFAULT / ALL TRADES	

		ı Group Leader/Supervisor ı Technician	1
2) - Obtain work start authorization from the 7920 Hot Cell Operations Shift Supervisor. Document on the Work Log before beginning work.			
		ı Supervisor	2
3) - Perform area setup as follows: stage all tools, RCT equipment, decon rags, etc. needed to perform these tasks. Place herculite, blotter paper, etc. on floor area for receipt of shield blocks. Ensure metered water addition line available in LAA.			
		ı Radiological Control Technician ı Supervisor ı Pipefitter ı Rigger/Ironworker ı Technician	3
4) - For removal of Tank Pit 2 Shield Blocks (a total of 5 shield blocks) perform the following: Place herculite on floor area designated for staging of Tank Pit Shield Blocks. Establish radio communication with control room personnel prior to block removal. During block removal allow RCT to perform surveys. If contamination levels are high use herculite to wrap shield blocks before placing them at the staging area. Using the 50/5T crane, remove key block from its position followed by the overall Big block at Tank Pit 2. Place overall key block and overall big block at the desired staging area. Install desired grating over the key block position. With the Tank Pit handrail in place, remove the north shield block from its position to the desired staging area. Install handrail as the north block is being removed from its position to keep a barrier in between the open pit and personnel. Remove middle block from its position and place block at the desired staging area, move handrail as the middle block is being removed. Remove south block from its position and place block at the desired staging area. At this point the Tank Pit handrail will be in position surrounding the Tank Pit opening. Using metered water addition line, add water to Tank Pit 2 to just cover the bottom of the tank pit (~200 liters) to aid in dose reduction as well as future leak testing. *Note: All critical lifts will be in accordance with NNFD-7920-SR-200 Appendix V. and ORNL form-543.*			
		ı Radiological Control Technician ı Supervisor ı Electrician ı Rigger/Ironworker ı Technician	3
5) - Prior to work repair in the Tank Pits consider the following: No ratchets are to be used in the tanks pits for TRU disconnect bolt manipulation. Only straight bars. Do not loosen TRU disconnect bolt more than 5 turns due to the risk of it falling out of its position. For using the right angle TRU drive to turn and disconnect; do not loosen disconnect bolt more than 10 turns at top of input drive (5 turns of the disconnect) due to the risk of it falling out of its position. (The right angle drive is 2 to 1- 2 turns of the wrench gives one turn of the disconnect bolt) When manipulating a TRU disconnect bolt be sure to keep up with the amount of turns during tighten and loosen. When lowering items into the Tank Pits be sure to use nylon string. Nylon string can be disconnected using concentrated HNO3 to dissolve the knot if necessary.			
		ı Radiological Control Technician ı Pipefitter ı Technician	5
6) - For removal of Tank Pit 6 Shield Blocks perform Step 4.			

		ı Radiological Control Technician ı Supervisor ı Electrician ı Rigger/Ironworker ı Technician	5

7) - For repairs in Tank Pit 2 perform the following:

Ensure camera is in working condition prior to use. As necessary, apply mechanical lubricant (knock 'er loose; wd-40) to disconnect bolts to aid in loosening/ tightening.

For repairs to the 2203 line, loosen TRU disconnect bolt (no more than 5 turns) with the appropriate socket and straight bar (no ratchet is to be used) to remove jumper line. Spring jumper line away from TRU disconnect. Insert special made 3/8 inch Hastelloy insert through Nozzle C1 and reconnect existing jumper. This will make Nozzle C1 a dip line. Perform leak test of repaired line as directed by 7920 Operations personnel using vacuum pull-up test.
If the special made 3/8 insert will not go through Nozzle C1, then insert a 1/4 Hastelloy line through Nozzle C1 and reconnect existing jumper. Test line for leaks.

For repairs to the 2302 line loosen TRU disconnect by ~ 2 turns with the appropriate socket and straight bar, shake the jumper and re-tighten, test for leaks from Cubicle 4 with assistance from 7920 Operations personnel. If leaks are still present loosen disconnect bolt (no more than 5 turns) with the appropriate socket and straight bar (straight drive at top of tank connection; right angle drive at line bundle connection). Remove jumper and inspect ferrule for damages. If damages are found consult with day supervision. If 2302 ferrule is good condition then replace jumper line with new line and tighten TRU disconnect. Perform leak testing as directed by 7920 Operations personnel using vacuum pull-up test from cubicle.

Following vacuum pull-up testing, perform pressurized water addition leak testing using 5 psi air for pressurization. Utilize remote camera to monitor for indications of leaks.

As necessary, apply nitric acid to knots of any nylon string/ strapping used to aid in installation/ placement of replaced lines.

With approval from RCT and RPO manager, pull replaced lines out of the tank pit into sleeving/ bagging and physically bend tubing to fit within 55 gallon drum.

		ı Radiological Control Technician ı Pipefitter ı Technician	6

8) - For repairs at Tank Pit 6 perform the following:

Flood tank pit 6 remotely or via metered water addition line to aid in dose reduction and leak testing.
Ensure camera is in working condition prior to use. As necessary, apply mechanical lubricant (knock 'er loose; wd-40) to disconnect bolts to aid in loosening/ tightening.

For repairs to the T6502 line (leak is in the jumper between position 11 of the line bundle and nozzle B) loosen TRU disconnects with socket and straight bar (straight drive at tank connection; right angle drive at line bundle connection) and remove existing jumper. Install new jumper line and tighten TRU disconnects. Perform leak test of new jumper with assistance from 7920 operations personnel using vacuum pull-up test from cubicle.

For repairs to the T6508 line (jumper is between position 26 of the right or west bundle and Nozzle K) loosen TRU disconnects with socket and straight bar and appropriate long handle tools and remove existing jumper. Inspect male and female ferrule for any damages. Inform Task Leader after inspection. Install new jumper and tighten TRU disconnects. Test for leaks using vacuum pull-up test from cubicle. Consult with 7920 operations personnel for assistance.

For repairs to the T6507 line (leak is in the jumper from the East wall position 15 to Nozzle C2) loosen TRU disconnects with socket and straight bar and appropriate long handled tools and remove existing jumper. Install new jumper and tighten TRU disconnects and test for leaks using pressure blow-through test. Leak testing shall be performed from Cubicle 4. Consult with 7920 operations personnel for assistance.

Following vacuum pull-up tests, perform pressurized blow-through tests using water and 5 psi air. Use remote camera for observing for indications of leaks.

As necessary, apply nitric acid to knots of nylon string/ strapping used to aid installation/ positioning of replaced lines.

With RCT and RPO Manager approval, Remove old lines from tank pit and pull up into sleeving/ bagging and bend tubing to physically fit within 55 gallon drum.

		ı Radiological Control Technician ı Pipefitter ı Technician	7

9) - Additional repairs to Tank Pit 6 include:

- Removal of remaining segment of the process line 3/8T-T6508-Zr in tank pit 6 to the TRU disconnect clamp number 26.
- Removal of leftover T6506/T6507/T6508 Line. Cut line using custom tool as needed.
- Installation of a new replacement line from the TRU disconnect clamp on the end plate to the TRU disconnect clamp of T-65 nozzle L.
- Removal of C-shaped bracket.
- Reconnection of the steam supply line 1/2T-T6532-C to tank T-65.

Note: For additional information see attached "Special Work Instructions", 7920-BOPM-452, and USQD/REDC/24-017

		ı Radiological Control Technician ı Supervisor ı Millwright ı Pipefitter ı Project Leader	1

10) - After repair work is complete, establish radio communications with 7920 control room personnel and install Tank Pit Shield blocks back into their position.

		ı Radiological Control Technician ı Electrician ı Rigger/Ironworker ı Technician	9

WORK DETAILS - Post Work Testing

Hazards	Permits/Controls	Resources	Dur

1) -
Perform inspection of each line after repairs.
Perform leak test of each repaired line. Communicate with Operations personnel with line testing.
Inform Group Lead/designee and Facility Management of test results.

		ı Radiological Control Technician ı Pipefitter ı Technician	1

WORK DETAILS - Closeout

Hazards	Permits/Controls	Resources	Dur
1) - Inform Building 7920 Group Lead/designee that repair work is complete. Perform cleanup of work area after repair work is complete.			
			1
2) - Remove loose strings as waste. Remove old jumpers as waste. Remove all tools for re-use, bagging ends as appropriate for contamination control and stage in toolbox located above RCW room.			
			8

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59107

PRE-JOB SAFETY REVIEW GUIDE

ID: 59107

Scope of Work: Review work package/plan to ensure all participants understand the work activity.

Hazards: Review the hazards identified in Job Hazard Evaluation (JHE) / work plan (IOP).

- Since the work package / plan was written: 1) Have conditions changed? 2) Are there new hazards? Refer to Field Notes and Focus Areas.

Hazard Controls / Permits: Review:

- Written permits for the work activity.
- Precautions, step warnings, Hold Points ...
- Personal Protective Equipment (PPE)
- Work instructions for information - e.g., steps where hazards are introduced.
- ORNL subject area requirements - e.g., non-permit hazard controls.

Performing Work:

- Discuss group/individual responsibilities for safe & effective work.
- Follow work instructions & safety procedures.
- Availability/location of materials, tools, etc.
- Any previous experiences / lessons learned?
- Response if work cannot be performed as planned.
- What is the worst thing that could happen?
- Are there *Potential error traps* with the job? → →
- Take a minute before: work start & leaving work area.
- Work Hand-off / Turnover - workers & Task Leader

→ Potential Error Traps:

- Time pressures
- Distractive environment
- High workload
- First time evolution
- First day back
- Vague guidance
- Over confidence
- Imprecise communications
- Work stress

Abnormal Situation Response:

- *Stop Work*: Observe an unsafe act, activity or condition that creates an imminent danger.
- *Emergency Response*: Discuss egress paths or other responses if problems are encountered.

Field Notes and Focus Areas: (Use this area as a work space to record notes related to new hazards identified in the field or changed conditions. Record feedback in work package/plan information systems.)

By signing below, I am indicating that I have been briefed on the potential hazards associated with completing this job.

Signature / Badge	Date	Signature / Badge	Date

T-65 and Tank Pit 6 Maintenance, 10/2024

This is a suggested sequence for the planned work in Tank Pit 6. This writeup has some detail but does not try to writeup every move or what tool to use in every step or even which tools to be placed into the tank pit. These suggestions do not prevent altering the sequence or the change in instructions when the need arises.

However, some rules need to be followed: A few of these are presented here.

1. In using the straight drive wrench on a TRU disconnect, never loosen more than 4 ½ turns from fully closed. Always keep up with the position of the clamp (the turns from closed). Always use a breaker bar handle and never use a rachet wrench on the straight drive tool as it is too easy to lose the position of the clamp (the turns). Accidental removal of the disconnect clamp from the disconnect body will lose the clamp, requiring a new clamp and a significant effort (including extended time) to replace.
2. In using the right-angle drive on a TRU disconnect, never loosen more than 9 1/2 turns from fully closed. Otherwise, use the same precautions as described above to keep up with the position of the clamp (the turns). In this case, if a clamp is lost it is much harder and more problematic to reinstall a new clamp.
3. The special clamp for T-65 should be investigated for any special limitations required for use with the straight drive before it is put into the tank pit. There may be no replacement if taken apart.
4. All string used in the pit must be Nylon such that it can be "burned" in two with con HNO3 if necessary.
5. All jumpers, pieces of line, and any other waste item that are to be lassoed for removal from the pit as waste should be free of entanglements before lassoing, to the point that the string attachment doesn't prevent final disentanglement (the attached string doesn't trap the line).

<u>T-65 waste jet, J-T65:</u> This jet system consists of the steam supply line, 1/2T-T6534-Zr (still attached to south wall disconnect), the jet body, the jet suction line, 1/2T-T6506-Zr (Loose from the T-65 disconnect, Nozzle L, but near original position), and the jet discharge, 1/2T-T6506-Zr (already loose from the waste header. All portions of this jet system are to be removed from position and eventually removed from the tank pit as waste as part of this Tank Pit maintenance. For the jet system, I'm assuming that the lassoing as outlined will not trap the lines but confirm this before attaching the string.

Suggest the following:

1. Lasso the end of the jet discharge line near the waste header with Nylon string behind the male ferrule. Tighten and tie off on the railing.
2. Cut the jet steam supply line as near the jet as possible. The jet, the suction line and discharge line are now free except for the previous string tie off and any entanglement with other lines.
3. Manipulate the jet and lines such that the jet suction line can be lassoed between the jet and suction male ferrule and tighten.
4. Then manipulate the jet and lines such that the discharge line can be cut. Cut the discharge line as close to the jet as possible. Tie off the jet and suction line to the handrails.

5. Lasso the cut end steam supply line and move the loop end as near the wall connection as possible before tightening. Then tighten.
6. Disconnect the steam supply line from the south wall. Top TRU disconnect on west side of T-65 service plug. Remove line from position and hang on handrails.
7. As necessary, manipulate the hanging lines free of any entanglements and tie off such they will not interfere of further work around T-65 and the route of the new jumper, T6508.

Old T6508 jumper line: The old T6508 jumper line is in place from Position (25 or 28? I still must look) on the west side of the west line bundle to Nozzle K of T-65. Previously, it was found that the Nozzle K disconnect could not be opened so this line into T-65 was abandoned and the Ta line below the disconnect was crimped closed. The line bundle end TRU disconnect was opened then closed back so the jumper line is still installed. Most of this jumper line is to be removed from position and eventually removed from the tank pit as waste as part of this maintenance entry into Tank Pit 6. Suggest the following:

1. Open the line bundle TRU disconnect and free the jumper from the TRU disconnect.
2. Note whether you need to cut the jumper and free it from other line entanglements before lassoing the disconnected end of the jumper. If not, lasso the jumper line behind the free male ferrule and tighten. Otherwise, wait until the jumper is free (Step 4) before lassoing and tying off to the handrails.
3. Cut the T-6508 jumper near T-65 as close to the nozzle K as possible.
4. Free the now disconnected jumper from entanglements and tie off with the other hanging jumpers, out of the way of further planned work in the tank pit.

Line T6507: In previous work, this jumper was removed from the east wall thru-plug TRU disconnect and from Nozzle C2 on T-65. Thus, it is free but resting on other lines near its original position. This old jumper is to be removed as waste as part of this maintenance entry into Tank Pit 6. This line is to freed from any entanglements and tied off with the other waste lines to the handrails, out of the way of further planned work. Suggest the following:

1. Without visual or photos, it is not clear whether the jumper should be lassoed first (or which end) or cleared of entanglements using appropriate tools before lassoing. Choose which is appropriate and act accordingly.
2. Hang the free jumper with the other jumpers for later removal from the tank pit.

Special bracket holding T-65 west side TRU Disconnects to the mounting platform: This bracket was installed to hold the T6502 disconnect (with broken mounting bolts) from falling off the mounting platform until the new T6502 jumper could be installed and tightened in place. It now has to be removed to allow installation of the special clamp on the Nozzle L position for the rerouted T6508 jumper.

My understanding is that this bracket is held in place only by gravity and that it has a handle (rod) pointing west that was used to help with the installation. If there is a design sketch available, it should be looked at in order to design the best approach for removal. Unless devised otherwise, I am assuming the best approach would be to firmly grip the handle with the horizontal gripper and then lift the bracket free of T-65 with a hook.

I suggest that this bracket be set on the old centrifuge platform and not be removed from rhe pit as waste, this bracket could presumably be used on another tank the size of T-65 if needed or possibly on T-65 again in the future.

Install new T6508 jumper in its place: This new jumper is to be lowered into Tank Pit 6 on a string and worked into position with tools. The routing at the west line bundle and to near T-65 is the same as the old jumper which has just been removed. Hopefully, it is remembered just how the jumper is to fit with other lines in this area. At T-65 the jumper is outed to Nozzle L on the west side of the tank instead of wrapping around to Nozzle K on the other side of T-65. I believe the jumper is designed with no other line interferences at T-651.

1. Wirth the jumper in place, install the ferrule into the disconnect on the line bundle end and tighten just enough to capture the line (equivalent of 1 ½ turns from full closed or 6 turns of the right-angle drive toward closed if it was opened the full 9 turns from closed when rhe old jumper was removed). Do not fully tighten.
2. At T-65, place the male ferrule into the Nozzle L female ferrule and be sure it seats, even if you have to hold the jumper with a gripper tool well away from the nozzle. The ferrules have to be together before the special clamp is slipped over the broken disconnect and these ferrules.

Install the special clamp at the Nozzle L position: I'll not try to give every movement of the special wrenches used to install the clamp but just a few reminders.

1. The broken disconnect (clamp bolt is broken off in the disconnect base) is still mounted to the disconnect mounting platform (or tank disconnect mounting bracket). These bolts allow a ½ inch float, up and down, and it is believed to be down in the current condition.
2. The special clamp has to fit under the disconnect, between the tank disconnect mounting plate and the disconnect. Thus, the disconnect has to be in the up position (will have to be raised the ½ inch if it is currently down). At the same time the clamp has to fit over the two ferrules which are already together.
3. Once the clamp is properly installed, tighten the special clamp until there is resistance. Then back off i/2 to 1 turn and shake the jumper. Finally tighten the clamp to the desired torque.
4. Go back to the line bundle end o the jumper, shake this line to assure proper alignment and then tighten to full desired torque (unless it gets tight before being fully closed, then loosen and repeat).
5. The line should now be ready for control room personnel to leak check.

Follow-up: When line tests good:

1. Burn String off the new T6508 jumper with con HNO3 and flush area with sufficient water. Hang string for waste removal.
2. I've furnished instructions before for removing string and jumper lines hanging on strings for the way we used to do it. Not sure this was followed last time but if anyone wants to see them, I think I can furnish them again.
3. I've furnished instructions before for removing tools from the pit for the way we used to do it. I know these were not followed in some instances in the previous jobs. However, I think I can resurrect them if anyone wants to see them.

I am not insisting that the old ways be followed since there is one big difference. That is all personal are now wearing bubble suits instead of just some personnel wearing coveralls and face masks when deemed necessary.

USQD Number: USQD/REDC/24-017
Revision Number: 0

UNREVIEWED SAFETY QUESTION DETERMINATION (USQD) CHANGE PACKAGE

Part I - Introduction

1. **Facility:** Radiochemical Engineering Development Center (REDC) Building 7920

2. **Subject of evaluation:** Reconnection of Process Line ⅜T-T6508-Zr to Hot Cell Evaporator Tank T-65

3. **Description of the change:**
Tank T-65 is located in hot cell tank pit 6. Tank T-65 is a about a 6 inch diameter by 4½ foot high cylindrical process tank with a capacity of about 22 liters. The tank shell is constructed of Hastelloy-C with a tantalum liner. The tank has 10 nozzle lines that are constructed of tantalum tubing that go down into the tank to various depths ranging from the bottom to the top of the tank and extend up about 3½ feet from the tank top end head plate to a disconnect support plate where they terminate in stainless steel female ferrule fittings. Various instrumentation/process/service lines with male ferrule fittings are connected to these nozzle lines using TRU disconnect clamps that are bolted onto the disconnect support plate. The TRU disconnect clamp consists of a Hastelloy-C bottom base block piece that holds the female ferrule fitting tube end and a top spring loaded stainless steel swing clamp piece that fits over the male ferrule fitting tube end. The swing clamp piece is attached with a stainless steel bolt to the base block piece and the bolt is tightened down to clamp the female and male ferrule fittings together. As a result of leaking lines to/from T-65, in 2023 the following repair work was performed and changes were made as addressed in USQD no. USQD/REDC/23-015. The process line ⅜T-T6508-Zr that was connected to the tank T-65 nozzle K (deep leg into bottom of tank for solution removal) was found to have a leak at the TRU disconnect clamp. This line was a solution uptake line from the tank to the hot cell cubicle 6 right equipment rack. Repair attempts to fix the leak were unsuccessful and resulted in the TRU disconnect clamp being broken beyond repair with the process line disconnected from the nozzle. As a result the nozzle K line was crimped in two places below the disconnect support plate permanently placing the nozzle K line from the tank out of service. The process line ⅜T-T6508-Zr was left disconnected with the disconnected end open into the tank pit. The TRU disconnect clamp for the tank T-65 nozzle line L (deep leg into bottom of tank for solution removal) that was connected to process line ½T-T6506-Zr was found to be damaged. This line was a solution transfer line from the tank to the waste header via a steam jet. During the course of a repair attempt, the disconnect clamp was further damaged beyond repair (bolt attaching swing clamp broke off at top side of base block) resulting in the process line ½T-T6506-Zr becoming disconnected from the nozzle line. The segment of process line ½T-T6506-Zr between the discharge of the steam jet and the waste header was disconnected at the TRU disconnect clamp on the waste header in tank pit 6 and a male ferrule plug fitting was installed in its place in female ferrule fitting at the disconnect. The tank T-65 nozzle L was left open to the hot cell tank pit. The process line ⅜T-T6507-Zr that was connected to the tank T-65 nozzle C2 was found to have a leak in its line segment in tank pit 6. This line was a solution addition line into the tank from the hot cell cubicle 4 back equipment rack. Instead of replacing the process line ⅜T-T6507-Zr segment in tank pit 6, the line segment was disconnected from the tank nozzle C2 and a male plug ferrule fitting installed into female ferrule fitting end of the nozzle at the TRU disconnect clamp. The other end of this line segment was disconnected at the TRU disconnect clamp on the tank pit 6 wall and the line segment was left in place in the tank pit. The process line ⅜T-T6502-Zr that connects to the tank T-65 nozzle B (deep leg into bottom of tank for solution removal) had a leak in its line segment in tank pit 6. This process line is a solution sampling/transfer line into hot cell cubicle 6. This line was replaced with a new line segment of the same construction. However, during the replacement, the bolts that mount the TRU disconnect bottom base block piece to the tank disconnect support plate were broken. With the disconnect base block piece being sandwiched between the base block pieces of two other disconnects the original line was able to be disconnected and the replacement line connected. To help keep the base block piece stay in place during this replacement activity, a C-shaped bracket fabricated out of ⅛ inch thick stainless sheet metal was installed onto the tank disconnect support plate. The bracket fit over lugs on the ends of the disconnect support plate. The bracket was left in place. Because the tank T-65 was now open to the hot cell tank pit through the deep leg nozzle L line, it is no longer being used as an evaporator tank and is only used for

solution storage. To prevent it from being used as an evaporator tank, the steam supply line to the tank T-65 heating/cooling jacket, line ½T-T6532-C, was disconnected in the chemical makeup area (MUA) room 213. Also the steam/air supply line to the steam jet, line ½T-T6534-C, was also disconnected in the MUA. The disconnection of these two lines in the MUA was addressed in USQD no. EUSQD/REDC/23-075. These lines, which in the MUA are constructed of ½ inch copper pipe with copper and brass/bronze sweated, compression, and threaded components (i.e., valves) and fittings, were cut at a convenient location and both ends sealed with brass/bronze compression cap/plug fittings.

This USQD evaluation addresses a change to remove the existing remaining segment of the process line ⅜T-T6508-Zr in tank pit 6 back to the TRU disconnect clamp (disconnect no. 26) on the end plate of the line bundle from cubicle 6 in the tank pit and install a new replacement line segment from the TRU disconnect clamp on the end plate to the TRU disconnect clamp of tank T-65 nozzle L. The existing line ⅜T-T6508-Zr is constructed of lengths of ⅜ inch Zircaloy-2 alloy tubing pieces welded together and with TRU disconnect male ferrule fittings on each end. The replacement line ⅜T-T6508-Zr will be constructed of lengths of ⅜ inch Zircadyne® 702 (Zr-702) alloy tubing pieces welded together and with TRU disconnect male ferrule fittings on each end. The use of Zircadyne® 702 (Zr-702) alloy tubing in place of the Zircaloy-2 alloy tubing, which is no longer available, for process lines in the hot cell tank pits is a change that was previously addressed in USQD no. USQD/REDC/10-023 and will not be addressed further in this USQD evaluation. To secure the end of the new line onto the base block of the tank T-65 nozzle L TRU disconnect clamp, a repair clamp assembly will be used. The repair clamp assembly consists of (1) a stainless steel base piece that will fit under the bottom and around the front of the TRU disconnect clamp base block and (2) a stainless steel ferrule clamp piece which will fit over the top side TRU disconnect clamp base block and the male end ferrule of the line and that will be attached and tightened down unto the repair clamp base piece using a stainless steel bolt to clamp the ferrule into the TRU disconnect clamp base block. The C-shaped bracket that was left in place on the tank T-65 disconnect support plate will be removed for the installation of the nozzle L repair clamp (it is no longer required and will be in the way of the repair clamp). With the tank T-65 nozzle L no longer open into the tank pit, tank T-65 will be returned to use as an evaporator tank. To return tank T-65 to use as and evaporator tank, the steam supply line ½T-T6532-C to the tank T-65 heating/cooling jacket will be connected back together using a brass/bronze union fitting in the MUA room 213. This change to replace the process line ⅜T-T6508-Zr and reconnect the steam supply line ½T-T6532-C is addressed in Balance of Plant Modification (BOPM) no. 7920-BOPM-452.

Additional changes will be made to remove the segments of the out of service process lines ½T-T6506-Zr and ½T-T6534-C from tank pit 6. Line ½T-T6534-C is the out of service steam supply line to the steam jet in line ½T-T6506-Zr and is open into the tank pit via the disconnected line ½T-T6506-Zr. Line ½T-T6534-C will be disconnected at the TRU disconnect clamp on the rear (south wall) of tank pit 6 and it and the already disconnected line ½T-T6506-Zr will be removed from the tank pit. The line ⅜T-T6507-Zr which is already disconnected at each of its ends will also be removed from the waste tank pit. All of the lines removed from the tank pit will be staged in the limited access area (LAA) room 120 for eventual disposal as solid waste.

4. Primary safety basis documents:

1. ORNL/7920/SAR Rev. 18, *Safety Analysis Report, Radiochemical Engineering Development Center Building 7920*, UT-Battelle, LLC.

2. ORNL/7920/SBS/2020-02 Rev. 4, *Safety Basis Supplement for the Receipt and Unloading of Several Drums with ^{238}Pu Loaded Special Form Capsules into Hot Cells*, UT-Battelle, LLC.

3. ORNL/NNFD/SSAR Rev. 20, *Oak Ridge National Laboratory Standardized Safety Analysis Report for Nonreactor Nuclear Facilities*, UT-Battelle, LLC.

4. ORNL/7920/TSR Rev. 10, Change No. 2, Change No. 3, Change No. 4, Change No. 5, Change No. 6, Change No. 7, Change No. 8, *Technical Safety Requirements, Radiochemical Engineering Development Center Building 7920*, UT-Battelle, LLC.

5. Safety analysis:
This USQD addresses changes to (1) replace and reconnect process line ⅜T-T6508-Zr in the hot cell tank pit 6 back to tank T-65, (2) remove other out of service process lines associated with tank T-65 from tank pit 6, and (3) in the MUA room 213 reconnect the steam line to the tank T-65 heating/cooling jacket to return tank T-65 back to use as an evaporator tank. This change does not introduce any new types or increased magnitude of hazards/energy sources that can (1) initiate any new types of accident events or exacerbate the consequences of any existing accident events evaluated in the Building 7920 safety basis (SB) documentation or (2) initiate malfunctions/failures structures, systems, or components (SSCs) or exacerbate the consequences of malfunctions/failures of SSCs. Until 2023 tank T-65 was an evaporator tank with steam supplied to its heating/cooling jacket and there are also other existing evaporator tanks with steam supplied to their heating/cooling jackets in tank pit 6 and other hot cell tank pits. No safety-class, safety-significant, or defense-in-depth SSCs are directly affected by this change. The hot cell tank pit tanks, associated instrumentation/process/service lines in the hot cell cubicles, tank pits, and MUA, and the building steam system are not identified as safety-class, safety-significant, or defense-in-depth SSCs in the Building 7920 SB documentation. There is only one accident event evaluated in the Building 7920 SB documentation potentially affected by this change. This is event no. A.6 in Table 3.4 of the Building 7920 Safety Analysis Report (SAR). This event is identified as "Simple spills and leaks of radioactive solutions in cell tank pit" with a frequency identified as "anticipated" ($>10^{-2}$ per year) and potential causes listed as "Spill or leak of solution from piping or tank" and "Leak of pressurized solution from piping." The unmitigated consequence is identified as "moderate" to the co-located on-site personnel and the off-site public with the mitigated consequence as "negligible" by crediting the hot cell confinement structure and associated ventilation confinement provided by the cell off-gas (COG) system and vessel off-gas (VOG) system. This change will not affect the frequency or consequences of this event as evaluated in the SAR. The frequency and consequence was not based on any specific construction details (e.g., fitting connections and types, materials of construction, specific lengths/routing in the tank pits) of the process piping. Also (1) the new replacement line will be constructed of lengths of ⅜ inch zirconium alloy tubing pieces welded together and with TRU disconnect ferrule fittings on each end, the same as the existing line and (2) the repair clamp for the tank T-65 nozzle L TRU disconnect is constructed of stainless steel, the same as the swing clamp it replaces, performs the same function as the swing clamp, uses a stainless steel bolt to clamp it together the same as the swing clamp, and thus will be no more likely to malfunction/fail than the swing clamp. No changes to the Building 7920 SB documentation are required for this change. The tanks and associated instrumentation/process/service lines in the hot cell tank pits are not described or discussed at a level of detail that is affected by this change.

6. Does the proposed change require revision of Technical Safety Requirements (TSR) or affect a U.S. Department of Energy (DOE) Condition of Approval? Yes__ No X
If yes, then DOE approval is required.

7. Does the change make any changes to the documented safety analysis? Yes__ No X
If yes, specify changes and attach.

Part II - USQD

1. Could the change increase the probability of occurrence of an accident previously evaluated in the documented safety analysis? Yes__ No X
Justification:
This USQD addresses changes to (1) replace and reconnect process line ⅜T-T6508-Zr in the hot cell tank pit 6 back to tank T-65, (2) remove other out of service process lines associated with tank T-65 from tank pit 6, and (3) in the

MUA room 213 reconnect the steam line to the tank T-65 heating/cooling jacket to return tank T-65 back to use as an evaporator tank. As discussed in the safety analysis (Part 1, Item 5) of this USQD, this change does not introduce any new types or increased magnitude of hazards/energy sources that can (1) initiate any new types of accident events or exacerbate the consequences of any existing accident events evaluated in the Building 7920 SB documentation or (2) initiate malfunctions/failures SSCs or exacerbate the consequences of malfunctions/failures of SSCs. There is only one accident event evaluated in the Building 7920 SB documentation potentially affected by this change. This is event no. A.6 in Table 3.4 of the Building 7920 SAR. This event is identified as "Simple spills and leaks of radioactive solutions in cell tank pit" with a frequency identified as "anticipated" ($>10^{-2}$ per year) and potential causes listed as "Spill or leak of solution from piping or tank" and "Leak of pressurized solution from piping." The unmitigated consequence is identified as "moderate" to the co-located on-site personnel and the off-site public with the mitigated consequence as "negligible" by crediting the hot cell confinement structure and associated ventilation confinement provided by the COG system and VOG system. This change will not affect the frequency of this event as evaluated in the SAR. The frequency was not based on any specific construction details (e.g., fitting connections and types, materials of construction, specific lengths/routing in the tank pits) of the process piping. Also (1) the new replacement line will be constructed of lengths of ⅜ inch zirconium alloy tubing pieces welded together and with TRU disconnect ferrule fittings on each end, the same as the existing line and (2) the repair clamp for the tank T-65 nozzle L TRU disconnect is constructed of stainless steel, the same as the swing clamp it replaces, performs the same function as the swing clamp, uses a stainless steel bolt to clamp it together the same as the swing clamp, and thus will be no more likely to malfunction/fail than the swing clamp. Thus, this change will not increase the probability of occurrence of any accidents previously evaluated in the documented safety analysis.

2. **Could the change increase the consequences of an accident previously evaluated in the documented safety analysis?** Yes__ No X

Justification:

This USQD addresses changes to (1) replace and reconnect process line ⅜T-T6508-Zr in the hot cell tank pit 6 back to tank T-65, (2) remove other out of service process lines associated with tank T-65 from tank pit 6, and (3) in the MUA room 213 reconnect the steam line to the tank T-65 heating/cooling jacket to return tank T-65 back to use as an evaporator tank. As discussed in the safety analysis (Part 1, Item 5) of this USQD, this change does not introduce any new types or increased magnitude of hazards/energy sources that can (1) initiate any new types of accident events or exacerbate the consequences of any existing accident events evaluated in the Building 7920 SB documentation or (2) initiate malfunctions/failures SSCs or exacerbate the consequences of malfunctions/failures of SSCs. There is only one accident event evaluated in the Building 7920 SB documentation potentially affected by this change. This is event no. A.6 in Table 3.4 of the Building 7920 SAR. This event is identified as "Simple spills and leaks of radioactive solutions in cell tank pit" with a frequency identified as "anticipated" ($>10^{-2}$ per year) and potential causes listed as "Spill or leak of solution from piping or tank" and "Leak of pressurized solution from piping." The unmitigated consequence is identified as "moderate" to the co-located on-site personnel and the off-site public with the mitigated consequence as "negligible" by crediting the hot cell confinement structure and associated ventilation confinement provided by the COG system and VOG system. This change will not affect the consequences of this event as evaluated in the SAR. The consequence was not based on any specific construction details (e.g., fitting connections and types, materials of construction, specific lengths/routing in the tank pits) of the process piping. Thus, this change will not increase the consequences of any accidents previously evaluated in the documented safety analysis.

3. **Could the change increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the documented safety analysis?** Yes__ No X

Justification:

This USQD addresses changes to (1) replace and reconnect process line ⅜T-T6508-Zr in the hot cell tank pit 6 back to tank T-65, (2) remove other out of service process lines associated with tank T-65 from tank pit 6, and (3) in the MUA room 213 reconnect the steam line to the tank T-65 heating/cooling jacket to return tank T-65 back to use as an evaporator tank. As discussed in the safety analysis (Part 1, Item 5) of this USQD, this change does not introduce

any new types or increased magnitude of hazards/energy sources that can (1) initiate any new types of accident events or exacerbate the consequences of any existing accident events evaluated in the Building 7920 SB documentation or (2) initiate malfunctions/failures SSCs or exacerbate the consequences of malfunctions/failures of SSCs. Also, no safety-class, safety-significant, or defense-in-depth SSCs are directly affected by this change. The hot cell tank pit tanks, associated instrumentation/process/service lines in the hot cell cubicles, tank pits, and MUA, and the building steam system are not identified as safety-class, safety-significant, or defense-in-depth SSCs in the Building 7920 SB documentation. Thus, this change will not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the documented safety analysis.

4. **Could the change increase the consequences of a malfunction of equipment important to safety previously evaluated in the documented safety analysis?** Yes__ No X
Justification:
This USQD addresses changes to (1) replace and reconnect process line ⅜T-T6508-Zr in the hot cell tank pit 6 back to tank T-65, (2) remove other out of service process lines associated with tank T-65 from tank pit 6, and (3) in the MUA room 213 reconnect the steam line to the tank T-65 heating/cooling jacket to return tank T-65 back to use as an evaporator tank. As discussed in the safety analysis (Part 1, Item 5) of this USQD, this change does not introduce any new types or increased magnitude of hazards/energy sources that can (1) initiate any new types of accident events or exacerbate the consequences of any existing accident events evaluated in the Building 7920 SB documentation or (2) initiate malfunctions/failures SSCs or exacerbate the consequences of malfunctions/failures of SSCs. Also, no safety-class, safety-significant, or defense-in-depth SSCs are directly affected by this change. The hot cell tank pit tanks, associated instrumentation/process/service lines in the hot cell cubicles, tank pits, and MUA, and the building steam system are not identified as safety-class, safety-significant, or defense-in-depth SSCs in the Building 7920 SB documentation. Thus, this change will not increase the consequences of a malfunction of equipment important to safety previously evaluated in the documented safety analysis.

5. **Could the change create the possibility of a different type of accident than any previously evaluated in the documented safety analysis?** Yes__ No X
Justification:
This USQD addresses changes to (1) replace and reconnect process line ⅜T-T6508-Zr in the hot cell tank pit 6 back to tank T-65, (2) remove other out of service process lines associated with tank T-65 from tank pit 6, and (3) in the MUA room 213 reconnect the steam line to the tank T-65 heating/cooling jacket to return tank T-65 back to use as an evaporator tank. As discussed in the safety analysis (Part 1, Item 5) of this USQD, this change does not introduce any new types or increased magnitude of hazards/energy sources that can (1) initiate any new types of accident events or exacerbate the consequences of any existing accident events evaluated in the Building 7920 SB documentation or (2) initiate malfunctions/failures SSCs or exacerbate the consequences of malfunctions/failures of SSCs. Thus, this change will not create the possibility of a different type of accident than any previously evaluated in the documented safety analysis.

6. **Could the change create the possibility of malfunction of equipment important to safety of a different type than any previously evaluated in the documented safety analysis?** Yes__ No X
Justification:
This USQD addresses changes to (1) replace and reconnect process line ⅜T-T6508-Zr in the hot cell tank pit 6 back to tank T-65, (2) remove other out of service process lines associated with tank T-65 from tank pit 6, and (3) in the MUA room 213 reconnect the steam line to the tank T-65 heating/cooling jacket to return tank T-65 back to use as an evaporator tank. As discussed in the safety analysis (Part 1, Item 5) of this USQD, this change does not introduce any new types or increased magnitude of hazards/energy sources that can (1) initiate any new types of accident events or exacerbate the consequences of any existing accident events evaluated in the Building 7920 SB documentation or (2) initiate malfunctions/failures SSCs or exacerbate the consequences of malfunctions/failures of SSCs. Also, no safety-class, safety-significant, or defense-in-depth SSCs are directly affected by this change. The hot cell tank pit tanks, associated instrumentation/process/service lines in the hot cell cubicles, tank pits, and

MUA, and the building steam system are not identified as safety-class, safety-significant, or defense-in-depth SSCs in the Building 7920 SB documentation. Thus, this change will not create the possibility of malfunction of equipment important to safety of a different type than any previously evaluated in the documented safety analysis.

Part III - Conclusion and Approval

Based on the responses above, the change:

X does NOT constitute an unreviewed safety question
__ does constitute an unreviewed safety question

Michael A. Green Digitally signed by Michael A. Green
Date: 2024.09.26 12:50:29 -04'00'

Preparer: M. A. Green Date

Barrett Roden
2024.09.27 11:05:19 -04'00'

Independent Reviewer: B. G. Roden Date

Approvals:

Digitally signed by Roger Weaver
Date: 2024.09.27 13:24:43 -04'00'

R. J. Weaver, REDC Facility Manager Date

Not applicable
N. L. Blair for Date
Nuclear Facility Safety Program Lead
Nuclear Facility Safety Division

QEA 1 of 1	Qualitative Exposure Assessment – Multiple Hazard Form

☐ **No QEA is required based upon a review of the types(s) of hazards associated with this activity/task**

☐ **QEA could not be conducted at the time the RSS/Workplan was reviewed/approved due to inadequate information provided by the PI, Work Planner/Package author on some or all agent(s)/hazard(s).**

List the agent(s) for which a QEA could not be conducted:	**N/A**
Discuss controls incorporated into Work control to assure EA is conducted in the future:	**N/A**

Process/Task	Line repairs at Tank Pit 2 and Tank Pit 6	**Facility #:**	7920	**Room/Lab/Shop #:**	LAA
Work Description	Addresses the hazards and controls to perform line repair at Tank Pit 2 and Tank Pit 6 in the LAA.	**Organization:**	NNFD	**RSS/Work Plan #:**	MWP059107

Agents and Control Information

	Process/Task	REC ID	Hazardous Agent	Quantity Magnitude	Primary Exposure Forms	Exposure Duration	Eng. & Adm. Controls	OEL
1	Ergonomics	N/A	Muscle Strain	Variable	Other	Variable	T, P, W/R	Task Dependant
2	Manual Material Handling	N/A	Ergonomic Strain	Variable	Other	Variable	T, P	Task Dependant
3	Formula 409 Antibacterial All-Purpose Cleaner	81193	Lauramine Oxide	32oz	Liquid	1/2-2 hours	GV, T, L/P, P	N/A
4	Nitric Acid	00275	Nitric Acid	Work Control Specific	Liquid	Variable	T, P, L/P, I/E	2 ppm
5	WD-40	82913	Isopropanol/Heptane	32oz	Mist	<1/2 hour	GV, T, L/P, P	200/400 ppm
6	Knock'er Loose penetrating oil	D7891	Petroleum Distillates	20oz	Liquid	1/2-2 hours	T, P, L/P, GV	5 mg/m3
7	Kano Lab Kroil (non-aerosol)	82905A	Diisobutyl Ketone, LVP Aliphatic Hydrocarbon	10oz	Liquid	<1/2 hour	GV, T, L/P, P	50ppm/100ppm

Routes of Entry Codes: Inh – Inhalation, P – Penetration, Ing – Ingestion, S – Splash, A – Absorption

Engineering Control Codes: GB – Glovebox, GV – General Ventilation, Hood – Other LEV Hood, I/E – Isolate or Enclosed Hazard, LH – Lab Hood, S – Shielding, W – Wet Methods

Administrative Control Codes: T – Training, L/P – Labeling or Posting, P – Written Procedure/Plan, LT – Limited Stay Time, W/R – Modified Work/Rest Cycle, BEI – Biological Monitoring, MS – Medical Surveillance

	Health Severity Rating	Exposure Rating 1-4	Certainty Rating 1-3	QEA Rating 1-4	Exposure Decision
1	2	1	1	3	3
2	2	2	1	4	4
3	1	2	1	3	3
4	4	3	1	7	7
5	2	2	1	4	4
6	2	2	1	4	4
7	3	1	1	4	4

QEA Rating= (Health Severity Rating + Exposure Rating) x Certainty Rating
Exposure Decision: Acceptable (2-7) Uncertain (8-15) Unacceptable (16-24)

QHSP Approver:	Corey Carnahan
Date:	10/1/2024

	Exposure Decision and Follow-up				
	Was Risk Acceptable?	Describe justification for classification	Uncertain & Unacceptable Exposures		
			Follow-up Priority	Monitoring Required?	Reccomendations
1	Yes	Personnel avoid compromising positions or use of excessive force. Taking stretch breaks and diversifing activities, as needed, or to alternate personnel is encouraged. Tools and equipment will be used as intended for the work activities. PPE/accessories will be made available to reduce ergonomic strain. Contact IS/IH for further evaluation	Low	No	N/A
2	Yes	Personnel will apply 30-50-30 criteria for non-repetitive lifting tasks and will use proper lifting techniques. For awkward loads or those exceeding 50 lbs., lifting aids or two-person lifts will be used, where feasible. There is no intended repetitive or production-type two-handed mono-lifting task associated with the work activities, therefore, the TLVs do not apply.	Low	No	N/A
3	Yes	Clear, green, thin liquid with a floral, citru odor.	Low	No	N/A
4	Yes	Makeup of nitric acid will be performed in the MUA lab hood. The interior/exterior of the lines in the ventilated tank pits have been rinsed with nitric acid followed by several water rinses. A small quantity of 15.8M nitric will be dispensed from a spray bottle to dissolve nylon string approximately 20ft away.	Low	No	N/A
5	Yes	The product will be used per manufacturer's recommendations in areas with adequate ventilation. Small quantity and short duration use to lubricate and remove bolts or other items. There is no realistic chance for a worker to receive a sufficient dose of the agent to pose a hazard.	Low	No	N/A
6	Yes	This product will be sprayed through a hose/line onto the fittings in the ventilated tank pit. Product is used per manufacturers reccomendations in areas with good ventilation (LAA)	Low	No	N/A
7	Yes	This product will be sprayed through a hose/line onto the fittings in the ventilated tank pit. Product is used per manufacturers reccomendations in areas with good ventilation (LAA)	Low	No	N/A

EUSQD Number: EUSQD/REDC/24-125
Revision Number: 0

EXPERT UNREVIEWED SAFETY QUESTION DETERMINATION (USQD) WORKSHEET

Part I - Introduction

1. Facility: Radiochemical Engineering Development Center (REDC) Building 7920

2. Subject of evaluation: Work Plan No. MWP059107 Rev. 1- Removal/Replacement of Tank Line Jumpers in Hot Cell Tank Pit 6

3. Description of the change:
This evaluation addresses the issuing of work plan no. MWP059107 Rev. 1, *Line repairs at Tank Pit 2 and Tank Pit 6*. The work plan was originally issued in November 2022 for repairing/replacing tank line jumpers (metal tubing lines to/from process tanks in tank pits) that were leaking in hot cell tank pit 2 and tank pit 6. The work plan MWP059107 Rev. 0 was addressed in USQD no. EUSQD/REDC/22-134 with the physical modifications made in the tank pits addressed in USQDs no. EUSQD/REDC/22-136 (tank pit 2) and USQD/REDC/23-015 (tank pit 6). The work activities were performed in December 2022 (tank pit 2) and June 2023 (tank pit 6). Further work is planned to be performed in tank pit 6 to remove two line jumpers from the tank pit and replace one other jumper that were all disconnected from tank T-65 in June 2023. The work plan no. MWP059107 Rev. 1 is being issued to address this additional work in tank pit 6. The physical modifications planned to be made have been addressed in USQD no. USQD/REDC/24-017. The basic work activities addressed in the work plan involve (1) removal of the hot cell tank pit roof blocks and installation of the handrail assembly around the open tank pit in the limited access area (LAA) room 120, (2) addition of water into the tank pit to cover the floor to a depth of up to several inches (~200 liters of water) for dose rate reduction and later leak testing of the replacement jumper line, (3) removal/replacement of the jumper lines, (4) leak testing of the replacement jumper line, and (5) reinstallation of the hot cell tank pit roof blocks. The removal and replacement of the tank pit roof blocks and installation of the handrail assembly is performed using the LAA 50-ton bridge crane with the lifting of the blocks over the hot cell bank performed in accordance with procedure NNFD-7920-SR-200 Appendix V. Prior to removing the hot cell tank pit roof blocks, the hot cell bank is placed into the limited operation mode in accordance with the Building 7920 Technical Safety Requirements (TSR). The addition of the water into the tank pit is performed using a hand-held wand assembly as was discussed in USQD no. EUSQD/REDC/22-120. The removal/replacement of the tank line jumpers involves (1) cutting at selected points and/or disconnecting the jumpers at TRU disconnects (if still connected) and removing the jumpers out of the tank pit by personnel working from above around the open tank pit using a long handled manual hand pump operated hydraulic cutter, long handled socket drive wrenches, long handled hand-operated grippers, and long handled hooks (the tools are incorporated into long aluminum and/or fiberglass poles), lowering and positioning the new replacement jumper in the tank pit by hand from above around the open tank pit using nylon cord lines tied around the jumpers and the long handled gripper/long handled hook tools, and connecting the jumper at the TRU disconnect fittings using the long handled socket drive wrench tool. A small electronic video camera mounted onto a fiberglass/metal pole may be held by personnel down into the open pit to provide viewing assistance for the work. The camera is powered from and output via connection with electrical cables to a low voltage power supply and liquid crystal display monitor located in the LAA. Prior to loosening the TRU disconnect fittings, a penetrating lubricant may be directed onto the disconnects from a spray can or squeeze bottle through a long length of metal tubing held down into the pit by personnel working from above. Also, after installation of the replacement jumper line, again using a long length of metal tubing, small amounts of concentrated nitric acid may be directed from a squeeze bottle onto the knots of the nylon cords to dissolve the knots so that the cords can be removed from the jumper lines. Two types of leak tests of the replacement jumper line may be performed. The first type involves pulling a vacuum on the jumper line via connection in a hot cell cubicle through a bottle using the cubicle vacuum air jet. The second type is a pressurized water test. To perform the leak test water is pressure transferred at up to about 5 psi through the jumper line and on into the connecting hot cell tank pit tank. The water is pressure transferred through the jumper line from a solution addition tank in the chemical make-up area (room 213) via connections in a hot cell cubicle. Personnel located around the top of the open tank pit observe for leaks from the jumper line by looking for drips into the water that was added onto the floor of the tank pit. The small electronic video camera mounted onto the pole may be held by personnel down into the open pit to assist in the observation. The work plan is being issued to provide formal work control for the tank pit jumper line removal/replacement activities.

DSA Change? Yes___ No_X_

4. Primary safety basis documents:
   ORNL/7920/SAR Rev. 18; ORNL/7920/SBS/2020-02 Rev. 4; ORNL/7920/TSR Rev. 10, Change No. 2, Change No. 3, Change No. 4, Change No. 5, Change No. 6, Change No. 7, Change No. 8; ORNL/7920/TSR Addendum No. 1 Rev. 1; and ORNL/NNFD/SSAR Rev. 20.

Part II - Expert Determination

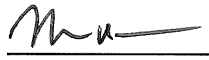
1. Relative to the documented safety analysis (DSA), is it readily apparent, based on expert knowledge, training, and experience, that the proposed change **does not**:
   a. Increase the probability or consequences of an accident described in the DSA?
   b. Directly or indirectly increase the probability of failure or consequence of a malfunction of equipment important to safety described in the DSA?
   c. Create the possibility of an accident of a different type than previously evaluated in the DSA?
   d. Create the possibility of a malfunction of equipment important to safety of a different type than previously considered in the DSA?

   Yes X No ___

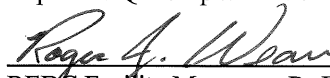
2. If the conclusion is Yes, provide a brief rationale why the change is not a USQ. Otherwise, prepare a standard USQD.
   The work plan is fully within the bounds of the Building 7920 safety basis (SB) documentation and does not (1) involve any new types of activities or equipment, (2) involve changes to any hazards, energy sources, or structures, systems, or components (SSCs), (3) affect the ways any SSCs function, perform, or can malfunction or fail, (4) involve new or different types of configurations, manipulations, or operations of any hazards, energy sources, or SSCs, or (5) involve changes to any preventive or mitigative controls or SSCs identified or discussed in the SB documentation. The opening up of the hot cell tank pits and performing maintenance and testing activities in the open tank pits involving removal/replacement of the tank line jumpers are existing operations considered and evaluated in the Building 7920 SB documentation. The use of long handled tools, penetrating lubricants, and nitric acid for performing the maintenance activities in open tank pits are existing type of equipment and materials used for these activities. When a hot cell tank pit is open to the LAA (roof blocks removed), the hot cell bank must be in the limited operation mode in accordance with the Building 7920 Technical Safety Requirements (TSRs). The work plan addresses the hot cell bank being placed into the limited operation mode prior the tank pit roof blocks being removed. The lifting of hot cell bank roof blocks in the LAA using the LAA 50-ton bridge crane is an existing activity considered and evaluated in the SB documentation. There is a specific administrative control (SAC) in the Building 7920 TSRs that requires lifts of loads over the hot cell bank (cells 1 through 9) and waste tank pit to be performed as critical lifts to ensure that a load will not be dropped and possibly cause significant damage to the hot cell bank or waste tank pit structures. This SAC is applicable to loads over 500 lbs lifted over the hot cell bank and waste tank pit which includes the hot cell tank pit roof blocks. The work plan incorporates the SAC for the lifting of the tank pit roof blocks over the hot cell bank by invoking Appendix V of procedure NNFD-7920-SR-200 which implements the SAC. No changes to the Building 7920 SB documentation are required for the work plan. Specific procedures and work plans for facility operations are not identified, described, or discussed in the SB documentation other than through the description of facility operations in Chapter 2 and the listing of facility operations in Preliminary Hazard Analysis (PHA) appendices of the Building 7920 Safety Analysis Report (SAR). This work plan does not affect any of the descriptions and listings of the facility operations.

Part III - Conclusion and Approval

Based on this determination, the proposed change does Not represent a USQ.



Expert USQD Preparer - M. A. Green — Date: 10-1-2024



REDC Facility Manager - R. J. Weaver — Date: 10/01/2024

BOPM number:	7920-BOPM-452		
Section 1: Change Origination/Identification			
Work Package No. M5167645	Facility 7920	Date 4/29/2024	Originator Name/UID Will Kirkland/WKK
Title of Change: Tank T-65 and Jumper 3/8T-T6508 Repair			
Component/System: T-65 Bk-Cf-Es-Fm Feed Adjustment Tank, 24 L			
Description of/reason for change (add attachments or redline drawings if necessary):			

Repairs to tank T-65 were previously carried out as described in 7920-BOPM-402. The following additional repairs will be performed to restore functionality to the tank:

1) The damaged J-T65 steam jet line will be removed. The steam jet uptake line 1/2T-T6506Zr (previously disconnected from T-65 nozzle "L" per 7920-BOPM-402) will be removed. The other end of T6506 (steam jet discharge) was previously removed from the waste header at the TRU disconnect and a Zr blank-off plug was installed on the waste header. The steam inlet line 1/2T-T6534Zr will also be removed back to the TRU disconnect at the wall. This line is currently isolated by being disconnected and capped in the MUA.

2) The connection of line jumper 3/8T-T6508Zr at T-65 nozzle "K" was previously abandoned and nozzle "K" was sealed off by crimping at two locations below the TRU disconnect. A new replacement jumper for line 3/8T-T6508Zr will be fabricated and will replace the existing T6508 jumper. This new jumper will connect to T-65 nozzle "L". Because of the damage to the nozzle "L" TRU disconnect swing clamp, the disconnect will be secured by a clamping device shown in drawing M7920TT6508-ASSY. The old T6508 jumper will be removed. The bracket installed under 7920-BOPM-402 to hold the broken TRU disconnect body at T-65 nozzle "B" (line 3/8T-T6502Zr) is expected to be removed to allow for the installation of the clamping device.

3) Steam line 1/2T-T6532-C, which had previously been disconnected in the Make-Up Area, will be reconnected to restore steam service to the tank through the use of brass Swagelok union or unions.

Does this change impact other components or systems?	◯ Yes (list below)	◉ No
N/A		
Does this require International Existing Building Code (IEBC) review?	◯ Yes	◉ No
Does this change involve new penetrations(s) of SSCs credited in the DSA for confinement of radioactive materials or shielding of personnel?	◯ Yes, proceed to next question	◉ No, proceed to Section 2
Do the penetration(s) meet the permit exclusions (refer to NNFD-002, *Change Control of Modifications)*?[1]	◯ Yes	◯ No, Initiate change control plan

Section 2: Change Documentation List

Existing and/or newly required documents (e.g., drawings, specifications, calculations, procedures)

N/A if change is below documentation threshold.	☐
Assessment and Commitment Tracking System entry made to revise high priority or electrical drawings	☐

Document number	Document title	Rev. no before change	Required for return to service
P7920TT6508-ASSY	3/8T-T6508 Zr Isometric Diagram	New	☐
E-52069	Engineering Flowsheet No. 6 (6PB)	15	☐
E-58062	Engineering Flowsheet No. 6A (6PC)	17	☐
M-12175-CP-257	Engineering Flowsheet No. 6CC	6	☐
E-57216	Cell Pit 6 Process Piping Plan	17	☐
E-57217	Cell Pit 6 Process Piping Elevation Sht #1	15	☐
P7920TT6508-P001	3/8T-T6508 Zr Spool #1	New	☐
P7920TT6508-P002	3/8T-T6508 Zr Spool #2	New	☐
M7920TT6508-ASSY	T-65 Repair TRU Disconnect Clamp Assembly	New	☐
M7920TT6508-P001	T-65 Repair TRU Disconnect Base Clamp	New	☐
M7920TT6508-P002	T-65 Repair TRU Disconnect Ferrule Clamp	New	☐
M7920TT6508-P003	T-65 Repair TRU Disconnect Clamp Bolt	New	☐
SK-P6-109	3/8T-T6508 Isometric Sketch 9-1-72	To be obsoleted	☐

Section 3: Applicable Codes/Standards

ASME B31.3, Process Piping

Section 4: Modification Evaluation

The replacement T6508 line will have all welds visually inspected and be hydrotested to 2500 psi per P7920TT6508-ASSY. The permission to use Zirconium 702 in place of Zircaloy 2 has been evaluated and approved in BOPEQ-REDC-10-05.

The crimping technique used was previously shown to be leak tight up to 30 psig as documented in 7920-BOPM-402.

A prototype of the TRU disconnect clamp assembly was fabricated, and performed as intended.

Safety and Technical Reviews			
Discipline	**N/A**	**Approval Signature**	**UID**
Facility safety basis engineer OR USQD/USQDSCREEN number (fill in below and attach copy when prompted)	☐	Michael A. Green Digitally signed by Michael A. Green Date: 2024.10.02 13:42:24 -04'00'	mga
USQD/REDC/2024-017			
Independent design reviewer	☐	Seth Hawkins Digitally signed by Seth Hawkins Date: 2024.10.02 12:13:37 -04'00'	hsh
Informed training group to evaluate training needs	☑		
Design authority (if multiple disciplines involved, if IEBC review is required, or if [1] is yes)	☑		
Additional subject matter expert	☐	Douglas Keener Digitally signed by Douglas Keener Date: 2024.10.02 14:57:52 -04'00'	dk3
Additional subject matter expert	☑		
System/process engineer		William M. Kirkland Digitally signed by William M. Kirkland Date: 2024.10.02 15:39:30 -04'00'	

Instructions:

General: All signatures should be accompanied by the signers' ORNL user ID (UID). If a UID is unavailable, the signer's badge number may be substituted.

Section 1: Change Origination/Identification: The originator shall complete Section 1 and submit this form to the system/process engineer.

Description of Change: Describe the change in enough detail to identify what components are being modified and the scope of the modification.

Impact: If the change impacts other components or systems, check “Yes,” then list and describe the impact. If the change involves penetration(s) that meet the exclusions of SBMS Subject Area: *Excavation/Penetration*, and are in SSCs credited in the DSA, then the design authority shall sign this form.

Section 2: Change Documentation: The system/process engineer lists all output documents that will be changed because of this modification, including drawings, NCRs, and procedures. The “Rev. no. before change” column should be completed with the current document/drawing revision number when the modification begins.

If the change does not alter any existing documents, check “N/A.”

Documents that are required to be completed for the item to be returned to service shall have the “Required for return to service” box checked.

High priority or electrical drawings shall be revised per NNFD-002, and an associated action shall be entered in the Assessment and Commitment Tracking System.

Section 3: Applicable Codes and Standards: The system/process engineer should complete this section. SBMS Subject Area: *Engineering Design*, contains SBMS Exhibit: *Design Codes and Standards*, which includes the engineering design standards applicable at ORNL. Designs must incorporate engineering hazard controls to alleviate potential workplace hazards where feasible and appropriate. If a hazard is identified that cannot be alleviated through one of the codes/standards listed in the Work Smart Standard (WSS), a request should be made to add the code/standard to the WSS.

Section 4: Modification Evaluation: The system/process engineer should complete this section using a graded approach commensurate with the complexity and scope of the change. Information entered in “Section 1: Description of Change” does not have to be repeated in this section. This section may include the following:

Modification Background/Description/Reason/Type: Describe the problem and the events leading to the change and include a description of how the system, equipment, or component operated before the proposed modification.

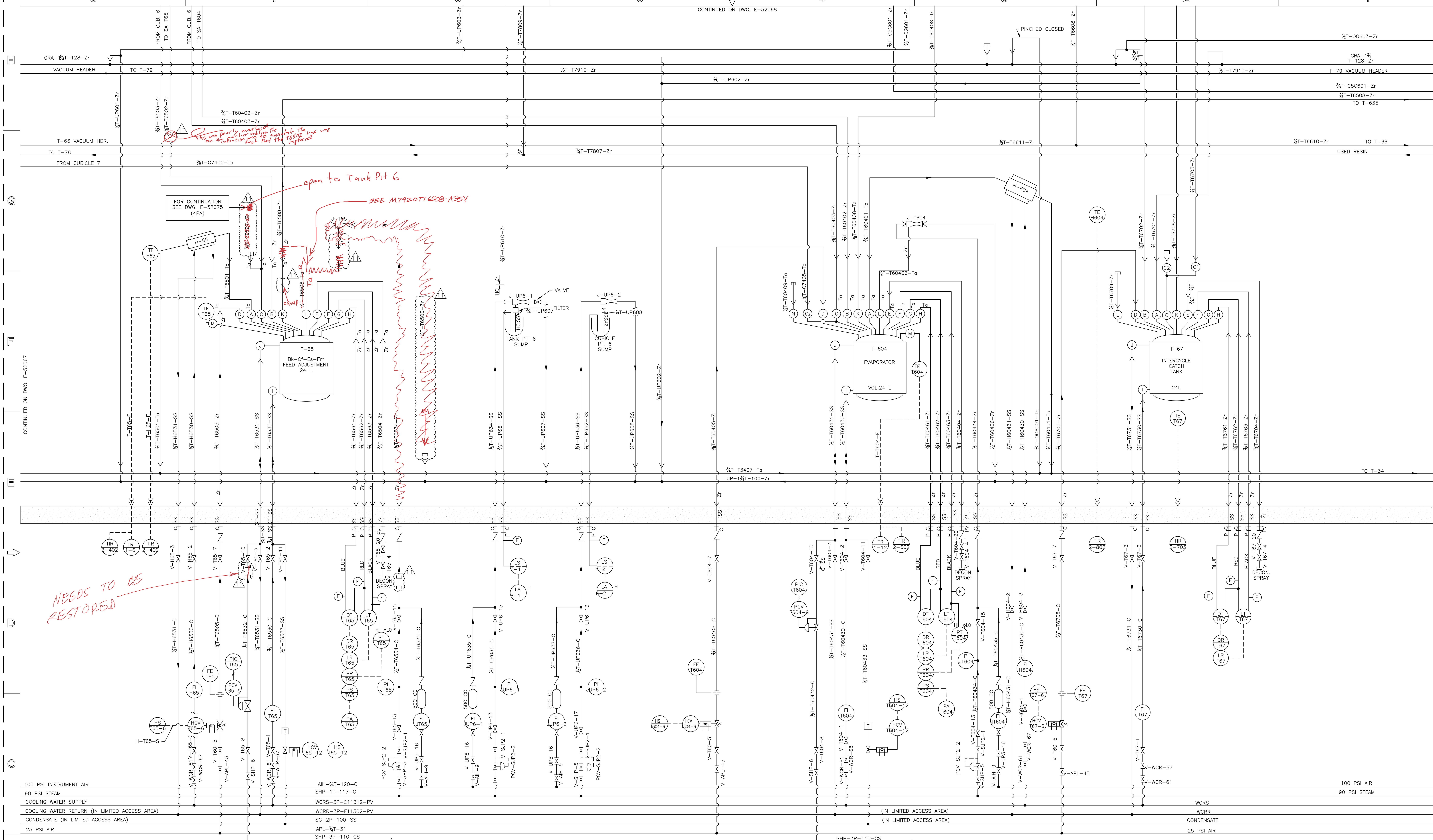
Design Basis and Functional Requirements/Justification: Describe the specific functions to be performed by the item affected by the design modification and the specific values or range of values that bound the design (e.g., pressure, temperature, flow, voltage input, voltage output). Provide an explanation, analysis, or calculation on why the proposed modification is within the boundaries of the cited design requirements.

Acceptance Criteria and Testing Requirements: Enter acceptance criteria/testing requirements that ensure the modification functions as expected.

Controls Required During Modifications: Describe any controls, (i.e., compensatory measures, TSR mode restrictions) required to be in place while this modification is being installed and normal equipment may be out of service.

Safety and Technical Reviews: The system/process engineer initially determines which reviews are required by checking or initialing the “N/A” column for those reviews not required. In addition to the applicable system engineer, review and approval from the design authority is required if multiple engineering disciplines are involved and/or if the change involves penetration(s) that meet the exclusions of SBMS Subject Area, *Excavation/Penetration*, and are in SSCs credited in the DSA. In this case, the design authority shall ensure all appropriate engineering input is obtained and may list additional engineers for review. After the system/process engineer has determined review applicability, this form should be routed to all reviewers for approval and signature. After approvals, route this form to the system/process engineer for final approval.

The approved form shall be included with the maintenance work package.



NO.	REVISIONS	DATE	APPD	APPD
12	ADDED & CHANGED VALVE TAGS	3-92		
11	REVISED STEAM JET PURGE STATION & GENERAL UPDATE	5-1-74	FLP	6-4-74
10	ADDED ⅜T-UP610-Zr ADDED FILTER & VALVE IN UP-607-SS	7-5-73	FLP	10-8-73
9	RELOCATED LINES TO CONFORM TO NEW BACK RACK 6 FLOWSHEET	7-13-72	FLP	
8	GENERAL REVISION	5-13-70	FLP	5-25-70
7	AS BUILT TO DATE	7-9-69	FLP	10-22-69
6	REV TO DATE	3-3-69	FLP	3-7-69
5	ADDED VAC HDR ½T-T7910-Zr	4-21-68		
4	GENERAL REVISION	11-8-67	FLP	11-15-67
3	GENERAL REVISION	10-6-65	OOY	10-6-65
2	GENERAL REVISION	11-9-64	OOY	11-10-64
1	GENERAL REVISION	2-20-64	OOY	3-9-64

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DRAWING ON WHICH ELEVATION, SECTION, OR DETAIL IS TAKEN. — NUMBER OR LETTER FOR ELEVATION, SECTION, OR DETAIL — DRAWING ON WHICH ELEVATION, SECTION, OR DETAIL IS SHOWN.

DRAFT- 01

REV	DESCRIPTION	BY	DSNR	CHK	DR	TL	ESDH	REQ	FAC	DATE	SR1	SR2	SR3	SR4	QR
16	11 NNFD-7920-DCN-197				N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A
15	9 THRU 10 SEE NNFD-7920-DCN-174/175	GRS	GRS	BJG	N/A	N/A	NMS	N/A	BGR	12-16-21	N/A	N/A	N/A	N/A	N/A
14	1 THRU 8 SEE NNFD-7920-DCN-155	GRS	GRS	AD	N/A	N/A	NMS	N/A	AWS	11/12/19	N/A	N/A	N/A	N/A	N/A
13	REDRAWN TO CAD FORMAT BY CADNET	TAJ/CY	N/A	FRC 5/31/07	N/A	N/A	DF 6/21/07	N/A	KW 6/14/07	6/21/07	GRS 6/19/07	N/A	N/A	N/A	N/A
	REVISION OR ISSUE PURPOSE	REVISION APPROVALS													

DEFAULT STANDARDS UNLESS OTHERWISE SPECIFIED

TOLERANCES:
FRACTIONS ± 1/64
XX DECIMALS ±0.01
XXX DECIMALS ±0.005
ANGLES ±0°-30'
BREAK SHARP EDGES 1/64 MAX.
FINISH =125 RMS

ALL DIMENSIONS ARE IN INCHES

WHENEVER A MANUFACTURER'S NAME OR CATALOG NUMBER IS INDICATED, AN APPROVED EQUAL MAY BE SUBSTITUTED

THIS DRAWING CREATED IN ACCORDANCE WITH ANSI Y14.5M–1994

DRAWING APPROVALS		DATE
DRAWN BY	HWF	9/27/62
DESIGNER	O.O. YARBRO	7/15/63
CHECKER		
DESIGN REVIEW		
TASK LEADER		
ENGINEERING SUPPORT DEPT HEAD		
REQUESTOR		
FACILITY MANAGER/DESIGNEE	W.D. BURCH	7/15/63
SPECIAL REVIEW	W.E. UNGER	
SPECIAL REVIEW	C.E. GUTHRIE	
SPECIAL REVIEW		
SPECIAL REVIEW		

REFERENCE DRAWING | DWG NUM

NONREACTOR NUCLEAR FACILITIES DIVISION
OAK RIDGE NATIONAL LABORATORY

UT-BATTELLE — Operated by UT-Battelle for the Department of Energy under U.S. Government contract DE-AC05-00OR22725 • Oak Ridge, Tennessee

ENGINEERING FLOWSHEET NO. 6 (6 PB)

TRANSURANIUM PROCESSING PLANT

1	48	49	50	PLANT	BLDG	FL	SHEET	OF	CLASS
3	R	M		X-10	7920	01	01	01	U

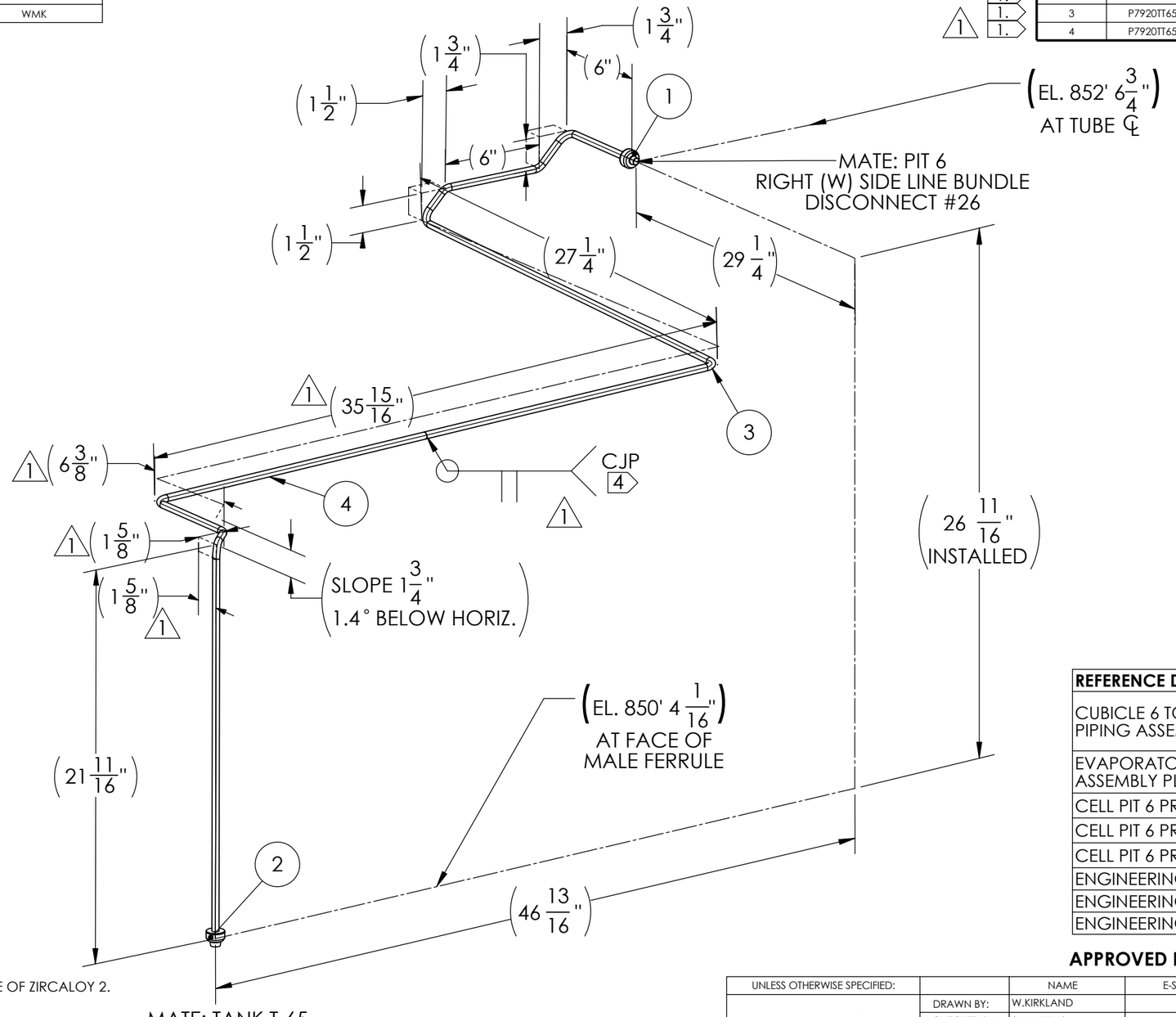
TYPE

SCALE: NONE | ID: E-52069 | REV: 16

FILE NAME: E52069_15.DWG

REVISIONS HISTORY			
REV.	DESCRIPTION	DATE	APPROVED BY
0	INITIAL RELASE	4/3/24	WMK
1	ADDED SPOOLS, MODIFIED ROUTING	5/13/24	WMK

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	D46015-GR2-PT7-7	TRU DISCONNECT FERRULE FOR 3/8" O.D. TUBING	1
2	C-52160 GROUP 2 PART 7	1/2" DISCONNECT FERRULE FOR 3/8" O.D. TUBING	1
3	P7920TT6508-P001	3/8T-T6508 Zr SPOOL #1	1
4	P7920TT6508-P002	3/8T-T6508 Zr SPOOL #2	1



REFERENCE DRAWING	DWG NUM
CUBICLE 6 TO PIT 6 RIGHT SIDE LINE BUNDLE PIPING ASSEMBLY	M-12175-CP-507
EVAPORATOR TANKS 43, 54, 65, T-73A, T-604 ASSEMBLY PLAN & ELEVATION	E-57136
CELL PIT 6 PROCESS PIPING ELEVATION SHT #2	E-57218
CELL PIT 6 PROCESS PIPING ELEVATION SHT #1	E-57217
CELL PIT 6 PROCESS PIPING PLAN	E-57216
ENGINEERING FLOWSHEET NO. 6CC	M-12175-CP-257
ENGINEERING FLOWSHEET NO. 6A (6 PC)	E-58062
ENGINEERING FLOWSHEET NO. 6 (6 PB)	E-52069

APPROVED FOR FABRICATION

FABRICATION AND GENERAL NOTES

1. ZIRCONIUM GRADE 702 MAY BE USED IN PLACE OF ZIRCALOY 2.
2. ROLL DISCONNECT FERRULES ON TUBE.
3. LENGTHS OF TUBING MAY BE FULL PENETRATION WELDED PRIOR TO BENDING. FIELD WELDING NOT PERMITTED.
4. TESTING: VISUALLY INSPECT ALL WELDS. HYDRO TEST ASSEMBLY TO 2500 PSI.
5. CLEANING: ALL TUBING SHALL BE CLEANED FREE OF ALL OXIDES, GREASE, AND FOREIGN MATERIAL.
6. THIS DRAWING SUPERSEDES SKETCH SK-P6-109.
7. IDENTIFICATION: TAG LINE WITH LINE NO. 3/8T-T6508 ZR PIT 6, DWG. E-57216.

UNLESS OTHERWISE SPECIFIED:		NAME	E-SIGNATURE / DATE
DIMENSIONS ARE IN INCHES	DRAWN BY:	W.KIRKLAND	
TOLERANCES: FRACTIONS =±1/32, X.XX DIMENSIONS =±N/A, X.XXX DIMENSIONS =±N/A, ANGLES =±1°	CHECKED BY:	S.HAWKINS	
	ENG APPR.	W.KIRKLAND	
	G.L. APPR.	A.SOUDERS	
	OPS. APPR.	J.SCHMIDLIN	
	Q.A. APPR.	N/A	
	OTHER	B.BOLTON	
	OTHER	F.CHATTIN	
INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5-2008			
THIRD-ANGLE PROJECTION	MATERIAL:		WEIGHT: 1.45 LBS

OAK RIDGE National Laboratory

OAK RIDGE NATIONAL LABORATORY
MANAGED BY UT-BATTELLE
FOR US DEPARTMENT OF ENERGY
UNDER CONTRACT NO.
DE-AC05-00OR22725 OAK RIDGE, TN

DESCRIPTION:

3/8T-T6508 Zr ISOMETRIC DIAGRAM

SIZE	PART NO.	REV
B	P7920TT6508-ASSY	1

SCALE: 1:24 | SHEET 1 OF 1

THIS DRAWING PRODUCED USING **SOLIDWORKS**

PLAN

NOTE:
REPLACE BOLTS IN DISCONNECT @ POSITION #29 WITH BOLTS 3¼" LG. SEE DWG. E-59036 FOR INSTALLATION NOTES OF LINE 3/8T-C7405 Ta (b) THRU EXIST. ½" LINE IN WALL PLUG. INSTALL SPACER PLATE UNDER DISCONNECT. SPACER PL TO BE 1½" x 1⅝" LG. x 1⅛" THK. SS. DRILL TO MATCH DISCONNECT MOUNTING BOLTS & TO CLEAR EXIST. ½" FEMALE FERRULE.

PART PLAN

MARKUP 2-27-2024

NOTE
SEE DWG. E-57218 FOR PARTS LIST AND GENERAL NOTES

REFERENCE DRAWINGS	DWG. NO.
RIGHT SIDE LINE BUNDLE	CP-507-E
LEFT SIDE LINE BUNDLE	CP-506-E
CONDENSER H-604	CP-122-E
CONDENSER H-66	CP-383-E
TANK T-67	E-57161
TANK T-60	E-57140
BASE LINE LOCATION	E52092
PLUG ASSEMBLY	E57196
OFF GAS HDR. SUB-ASSEMBLY	E57183
WASTE HDR. SUB-ASSEMBLY	E57187
TANK SUPPORTS CELL PIT #6	E52096
TANK T-602, PLAN & ELEV.	E57051
IN-CELL THERMOCOUPLE DISCONNECTS	T-10001-Q 158-D-0
DETAILS PROCESS PIPING CELL PIT #6	E-57219
INST. SERVICE PLUG CELLS 1-7	E57736
REMOVABLE INTER-PIT PLUG PIPING	E57197
Zr 2 STEAM JET ASSEMBLY & DETAILS	E-52093
ASSEM. & DETAILS EXCH. H-60	E57221
ASSEM. & DETAILS EXCH. H-65	E57222
TANKS T-61 & T-66	E-57157
EVAP. TANKS T-604 T-65 ASSEM. PLAN & ELEV.	E-57136
REMOVEABLE INTER-PIT PLUG PITS 1-7	E-57198
SERVICE PLUG ASSEMBLY CELL PIT #6	E-52107
ELEV. PROCESS PIPING CELL PIT 6 SHT. 2	E57218
ELEV. PROCESS PIPING CELL PIT 6 SHT. #1	E57217

WELDING REQUIREMENTS				
INTERNAL			EXTERNAL	
WELDING	INSPECTION	INSP. SCH.	WELDING & INSPECTION	OTHER REFERENCES
PS-52	MET-WR-204	B	MET-WR-11	MET-WS-3
TANT		B		

NO.	REVISIONS	DATE	APPD	APPD	AEC
17	ADDED FIRE DETECTION THERMOCOUPLE UNDER CUB6 & MISC REV.				
16	REMOVED LINE P72004 FROM T-60 NOZ. C-1 POSITION & REPLACED WITH LINE 6011. REROUTED LINE 60408 T-604 NOZ. K TO RT. SIDE LINE BUNDLE POS. 8	9-84	SOV	9-18-84	
15	SWAPPED DESIGNATIONS OF LINES 60430 & 60431	9-82	SOV		
15	CHG'D. LINE NO 7709 TO C5C702. ADDED LINE 3/8T-C5C701 Zr IN POS. 13 AT EAST SIDE.	8-1-78			
14	CHG'D. LINE NO ½T-T7708 Zr TO ½T-T1011 Zr	5-17-74	FJP	8/23/74	
13	ADD LINES UP-610 Zr & UP-510 Zr. REPLACED LINES 5802 & 5803. DELETED LINE 5809	7-10-73	FJP	10/8/73	
12	ABANDONED P-72006. REMOVED LINE TAGGED P-72004, CHANGED 6007 (FROM PIT 7) TAG TO P-72004, CHG'D. LINE TAGGED C-7305 TO P-71004. CHANGED ROUTING OF LINES 6508, 3407, 60402, UP-634, UP-661 & OG-601. ADDED SOME REF. DWGS.	10-3-72	FJP	10/27/72	
11	CHANGED DESTINATION OF 3/8T-T6007 FROM T-60 TO CONNECT TO LEFT SIDE LINE BUNDLE IN THIS PIT	5-23-72	FJP	5/24/72	
10	REVISED TO SHOW CHANGES IN NEW LEFT & RIGHT LINE BUNDLES	2-4-72	FJP	2/11/72	
9	ADDED LINE ½T-T7212 Zr & CHANGED ROUTING OF 3/8T-T60408 Ta	9-24-70	FJP	9/24/70	
8	GENERAL REVISION	8-27-70	JRC	8-27-70	
7	AS BUILT TO DATE	7-8-69	FJP	10/22/69	
6	UPDATED CENTRIFUGE PIPING. RELOCATED 3/8"T-T60404. ADDED H-604 - ½T-T7910 Zr - 3/8"T-T4312 Zr. REPLACED T-601 WITH T-604	JNW 2-5-68			
5	CHG. & REPLAN LINE 3/8 T-C 7405 Ta & 3/8T-T6003 Zr	3-6-67	BZ	FJP 3-6-67	
4	ADDED LINES 3/8"T-PG0806-SS, 3/8"T-C60103-SS. RELOCATED LINES 3/8"T-C60204-Zr & 3/4T-TC0201-Zr	3-25-66	BZ	O.O.Y. 5-11-66	NR
3	ADDED DIM. TO CENTRIFUGE PIPING	2-14-66	BZ	FLP/BZ	NR
2	REROUTED LINES #3/8"T-C7405 Zr & 3/8"T-T3503 Zr TO GAMMA SPECTROMETER PLUG	1-10-66	BZ	OOY/BZ	NR
1	ADDED CENTRIFUGE, F-61, TANKS, T-66 & T-602, AND CONNECTING LINES. ADDED PART PLAN	8-16-65	BZ	O.O.Y.	NR

DRAWN	DATE	SUBMITTED	DATE	APPROVED	DATE
WB ORGDP	5-14-64	E. Zimmerman	1-21-65		
DESIGNED T.S.	DATE	APPROVED	DATE	APPROVED	DATE
WB ORGDP	1-21-65				
CHECKED	DATE	APPROVED	DATE	APPROVED	DATE
D.R. ORGDP	1.21.66				

121-100 310-100

SECTION & DETAIL KEY: NUMBER OF SECTION OR DETAIL; DRAWING ON WHICH SECTION OR DETAIL IS TAKEN; DRAWING ON WHICH SECTION OR DETAIL IS SHOWN

A-70644-72

A-35477-53

APPROVED: W.D. Burch [signature] — UCC-NUCLEAR DIVISION — DATE 2-11-65
REV. 0
APPROVED: L. H. JACKSON — ATOMIC ENERGY COMMISSION — DATE MAR 12 1965

CLASSIFICATION

LIMITS ON DIMENSIONS UNLESS OTHERWISE SPECIFIED
FRACTIONS: ± 1/8"
DECIMALS: ±
ANGLES: ±
SCALE: 1/4" = 1"

TRANSURANIUM PROCESSING PLANT — BLDG. NO. 7920

CELL PIT 6 PROCESS PIPING PLAN

OAK RIDGE NATIONAL LABORATORY
OPERATED BY
UNION CARBIDE NUCLEAR COMPANY
DIVISION OF UNION CARBIDE CORPORATION
OAK RIDGE, TENNESSEE

SUBMITTED	ACCEPTED	APPROVED
		O.O. Yarbro 12-11-65

E-57216 — REV 17

DIETZGEN NO. 127M DRAFTEX

MICROFILMED

NO.	REVISIONS	DATE	APPD	APPD	AEC
3	CHG'D & REFRAN LINE 3/8T-C7405 Ta & 3/8T-T6003Zr	3-1-67		FJP	
2	REROUTE LINE 3/8T-C7405Zr & 3/8 T-T6503, TO GAMMA SPECTROMETER	1-10-66			NR
1	ADDED LINES 3/8 T-T6102Zr & 3/8 T-T6103Zr	8-16-65		O.O.Y.	NR

DRAWN	DATE	SUBMITTED	DATE	APPROVED	DATE
MEDVED	5-15-64	B. Zimmerman	1-21-65		
DESIGNED	DATE	APPROVED	DATE	APPROVED	DATE
WB T.S.	1-21-65				
CHECKED	DATE	APPROVED	DATE	APPROVED	DATE
D.R.	1.21.65				

121-100 A-70644-72

DIETZGEN NO. 127M DRAFTEX

SECTION & DETAIL KEY: NUMBER OF SECTION OR DETAIL; DRAWING ON WHICH SECTION OR DETAIL IS TAKEN; DRAWING ON WHICH SECTION OR DETAIL IS SHOWN

7	CHANGED ROUTING OF 3/8T-T60408 Ta	9-24-70	FJP	9/24/70
6	GENERAL REVISION	7-24-70	JRC	8-27-70
5	AS BUILT TO DATE	7-8-69	FJP	10/24/69
4	ADDED H-604, 1/2"T-H60430SS, 1/2"T-T7910Zr, 1/2"T-T7908Zr, 3/8"T-T4312Zr & 3/4"T-T60401 Ta	2-5-68 JNW		

REV CONTINUED

12	CHG'D LINE No 1/2T-T 7708 Zr TO 1/2T-T1011 Zr	5-17-74	FJP	8/23/74
11	ADDED LINES UP-510 Zr & UP-610 Zr	7-10-73	FJP	10/8/73
10	REMOVED LINE TAGGED P-72004. CHANGED 6007 (FROM PIT 7) TAG TO P-72004. RELOCATED LINES 6508, 3407, UP634, & UP661	10-3-72	FJP	10/27/72
9	NOTED THAT EXISTING 3/8T-T6007 TO BE PUT OUT OF SERVICE. SHOWED ROUTING OF NEW 3/8T-T6007 TO LEFT BUNDLE OF THIS PIT		FJP	5/24/72
8	REVISED TO SHOW CHANGES IN NEW LEFT & RIGHT LINE BUNDLES	2-4-72	FJP	2/11/72

15	ADDED FIRE DETECTION THERMOCOUPLE UNDER CUB-6 & MISC. REV.		
14	REMOVED LINE P-72004 FROM T-60 NOZ. C, POSITION & REPLACED WITH LINE 6011. REROUTED LINE 60408 FROM T-604 NOZ. K. TO POSITION 8 OF RIGHT SIDE LINE BUNDLE.	9-84	SOV
13	CHG'D LINE No 7709 TO 1/2T-C5C702 Zr ADDED LINE No 1/2T-C5C701 Zr IN POS. 13	8-1-78	SOV

MARKUP 2-27-2024

APPROVED: W.D. Burch /ooy UCC-NUCLEAR DIVISION 2-11-65
Rev. 0
APPROVED: E H JACKSON ATOMIC ENERGY COMMISSION MAR 12 1965 DATE

REFERENCE DRAWINGS	DWG. NO.
ELEV. PROCESS PIPING CELL PIT #6 SHT. 2	E-57218
PLAN PROCESS PIPING CELL PIT #6	E-57216

TRANSURANIUM PROCESSING PLANT BLDG. NO. 7920

CLASSIFICATION

CELL PIT 6
PROCESS PIPING
ELEVATION SHT. #1

LIMITS ON DIMENSIONS UNLESS OTHERWISE SPECIFIED
FRACTIONS: ± 1/8"
DECIMALS: ±
ANGLES: ±
SCALE: 1/4" = 1'

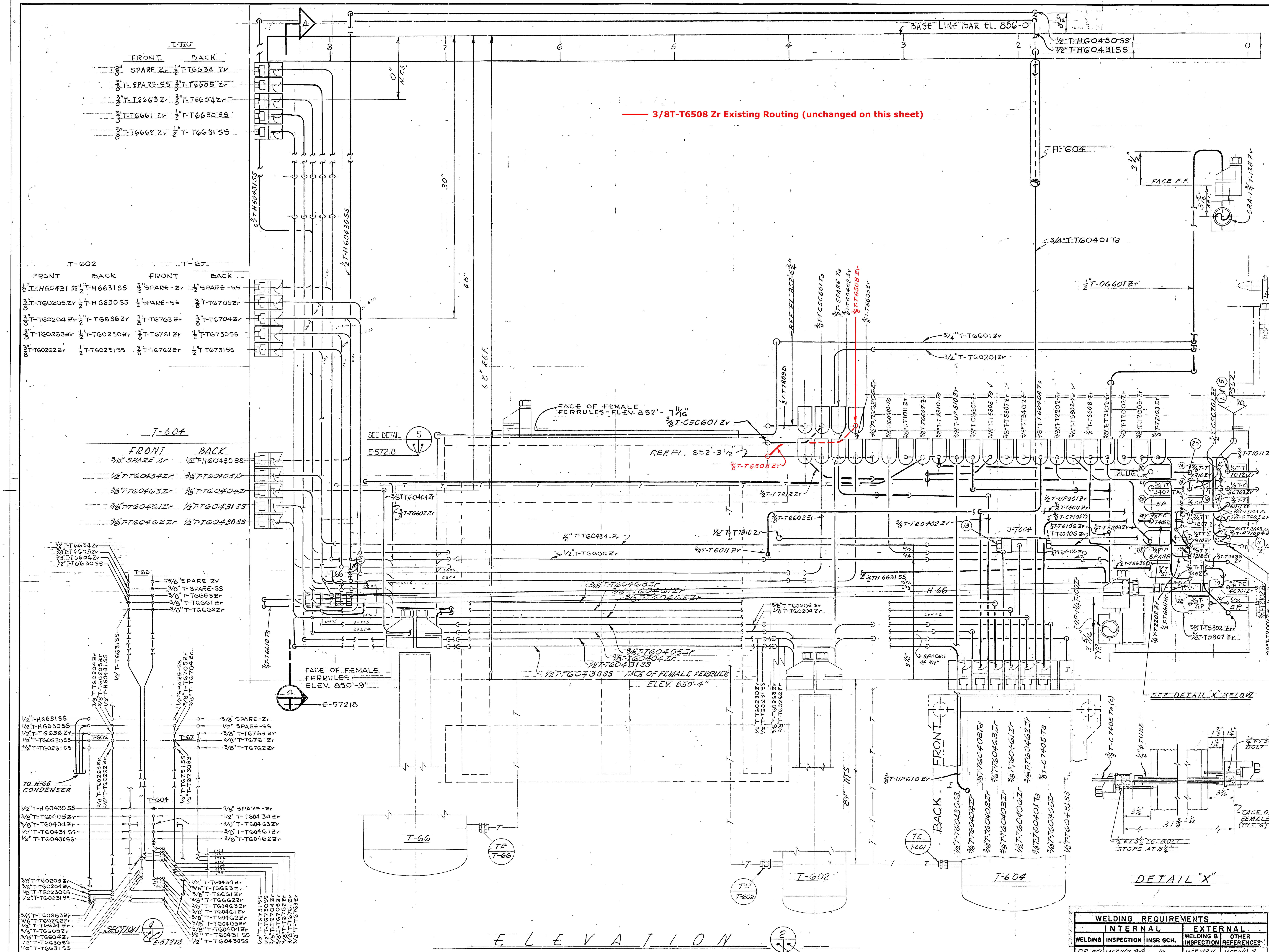
OAK RIDGE NATIONAL LABORATORY
OPERATED BY
UNION CARBIDE NUCLEAR COMPANY
DIVISION OF UNION CARBIDE CORPORATION
OAK RIDGE, TENNESSEE

SUBMITTED	ACCEPTED	APPROVED
		O.O. Yarbro 2-11-65

E-57217 REV 15

MICROFILMED

A-70644-72 316-10



PART NO.	DWG. NO.	NO. REQD.	DESCRIPTION (NAME, SIZE, ETC.)	MATERIAL
1	E-57216	657'-0"	3/8" O.D. TUBE X .049" WALL	ZIRCALOY 2 MET. RM-B213
2	E-57216	105'-0"	1/2" O.D. TUBE X .049" WALL	ZIRCALOY 2 MET. RM-B213
3	E-57216	57'-0"	3/4" O.D. TUBE X .049" WALL	ZIRCALOY 2 MET. RM-B213
4	E-57216	15'-0"	3/4" O.D. TUBE X .020" WALL	TANTALUM MET. RM-B204
5	E57216	10'-0"	3/8" O.D. TUBE X .020 WALL	TANTALUM MET. RM. B-204
6	E-57216	160'-0"	1/2" O.D. TUBE X .049" WALL	S.S. TP-304 ASTM A-269
7	C-46015 PT. 7 GR. 2	155	MALE FERRULE 3/8" O.D.T.	ZIRCALOY 2 MET RM-B121
8	C-46019 PT. 7 GR. 2	31	MALE FERRULE 1/2" O.D.T.	ZIRCALOY 2 MET. RM-B121
9	C-55942 PT. 7 GR. 2	13	MALE FERRULE 3/4" O.D.T.	ZIRCALOY 2 MET. RM-B121
10	C-46020 PT. 7 & 7a GR. 1	3	MALE FERRULE 3/4" O.D.T.	S.S. & Ta
11	C-46020 PT. 6 GR. 1	3	FEMALE FERRULE 3/4" O.D.T. (Ta)	S.S. 304 & Ta
12	C 46015 PT 7 GR. 1	4	MALE FERRULE 3/8" O.D.T.	SS-304
13	C-46019 PT. 7 GR. 1	32	MALE FERRULE 1/2" O.D.T.	S.S. 304
14	C-46012 PT. 7 & 7A, GR. 1	1	MALE FERRULE 3/8" O.D.T.	S.S. & TA
15	E-57216	2	3/4" EJECTOR - SHUTTE & KOERTING	S.S. 316
16	E-57217	2	3/4" SWAGELOK MALE CONN. - #1210-1-12	S.S. 316
17	E-57217	2	1/2" SWAGELOK MALE CONN. - #810-1-8	S.S. 316
18	E-52093	5	Zr-2 STEAM JET	ZIRCALOY 2
19	E-57217	2	3/4" CHECK VALVE STYLE CON-075	S.S. 316
20	E-57216	40'-0"	3/4" O.D. TUBE x .049" WALL	SS TP 304 ASTM A-269
21	C 55942 PT. 7 GR. 1	2	MALE FERRULE 3/4"	S.S. 304
22	E-57217	2	SWAGELOK FEMALE CONN - 3/4" IPS x 3/4" T #1210-7-12	S.S. 316
23	E-57217	2	3/4" SWAGELOK UNION - #1210-6	S.S. 316
24	E-57217	2	3/8" SWAGELOK UNION - #600-6	S.S. 316
25	C-52160 PT. 7, GR-2	7	1/2" x 3/8" O.D.T. MALE FERRULE	ZIRCALOY 2 MET-RM-B121
26	———	23	1/2" MALE PLUG	PLASTIC
27	———	15	3/8" MALE PLUG	PLASTIC
28	C-57604 PT. 7, GR. 2	7	MALE FERRULE 3/4" x 3/8" O.D.T.	Zr. 2 MET RM B-121
29	C-57624 PT. 9, GR. 4	6	3/4" MALE PLUG	Zr 2 MET RM B-121
30	E-57605 PT. 7, GR. 2	1	MALE FERRULE 3/4" x 1/2" O.D.T.	Zr. 2 MET RM B-121
31	———	2	3/4" MALE PLUG	PLASTIC
32	E-55835 PT. 9, GR. 4	5	1/2" MALE PLUG	ZIRCALOY 2 MET. RM B-121
33	C-55834 PT. 9, GR. 4	1	3/8" MALE PLUG	ZIRCALOY 2 MET RM B-121
34	E-57216	43'-0"	3/8" O.D. TUBE x .049" WALL	SS TP 304 ASTM A-269
35	C-46019 PT. 6A, GR-2	1	1/2" O.D.T. FEMALE FERRULE	ZIRCALOY 2
36	C-46015 PT. 6A, GR-2	1	3/4" O.D.T. FEMALE FERRULE	ZIRCALOY-2
37	C-58083 PT. 7, GR. 2	1	MALE FERRULE 3/8" x 1/2" O.D.T.	ZIRCALOY-2
38	C-58083 PT. 7, GR. 1	2	MALE FERRULE 3/8" x 1/2" O.D.T.	SS-304
39	D-46121	4	DISCONNECT CLAMP	STAINLESS STEEL
40	C-46015 PT. 6A, GR. 2	4	3/8" FEMALE FERRULES	ZIRCALOY-2
41	C-52160 PT. 7 GR. 1	1	1/2" X 3/8" O.D.T. MALE FERRULE	SS-304
42	C-57604 PT. 7 GR. 1	1	3/8" X 3/4" O.D.T. MALE FERRULE	SS-304

GENERAL NOTES

FABRICATION

1. PIPING SHALL BE FABRICATED AND INSTALLED IN PIT PIPING ASSEMBLY JIG, DRAWING NO. E-52104. DIMENSIONALLY CHECK JIG BEFORE INSTALLING PIPING.
2. ROLL DISCONNECT FERRULES ON TUBES IN ACCORDANCE WITH ORNL SPECIFICATION CF-64.1.
3. BEFORE ASSEMBLING STEAM JETS AND CONNECTING TUBING, PARTS #3 AND #4 SHOWN ON DRAWING E-52093 MUST BE INSTALLED ON TUBING BEFORE FERRULES ARE INSTALLED.
4. ALL LINES THAT CONNECT TO DRAIN HEADER (UP 1-3/4" T-100 ZY) SHALL SLOPE 1/8"/FT TO DRAIN HEADER. ALL OTHER LINES SHALL SLOPE 1/8"/FT. TO VESSELS.
5. THE COMPLETE PIPING SYSTEM SHALL BE ASSEMBLED IN THE ASSEMBLY JIG AND CLAMPED IN DISCONNECT CLAMPS. AFTER PIPING IS IN PLACE, ASSEMBLE AND RUN T.E. TUBING (SHOWN - T - ON DRAWING) SEE ORNL DRAWING 1-10001-Q-158-D-0 FOR DETAILS.
6. ALL SPARE POSITIONS IN CUBICLE TO PIT BUNDLE, PIT SERVICE PLUGS, AND INTER-PIT BUNDLES SHALL BE BLANKED OFF WITH APPROPRIATE SIZE PLASTIC BLANK OFF PLUGS.
7. TESTING: HELIUM LEAK TEST BY EVACUATION METHOD ALL JOINTS IN EACH PIPE ASSEMBLY, LEAK RATE SHALL NOT EXCEED 10^{-7} STANDARD CC OF HELIUM PER SECOND.
8. CLEANING: ALL PIPING SHALL BE CLEANED FREE OF ALL OXIDES, GREASE AND OTHER FOREIGN MATERIAL. PLUG ENDS OF PIPE WITH PLASTIC PLUGS AFTER CLEANING.
9. IDENTIFICATION: TAG EACH LINE WITH: LINE NO.______ PIT 6, DWG. E-57216 AND NUMBER THE LINE IN ORDER OF PREFERRED REMOVAL FROM THE JIG.

WELDING REQUIREMENTS

INTERNAL			EXTERNAL	
WELDING	INSPECTION	INSP. SCH.	WELDING & INSPECTION	OTHER REFERENCES
PS-52	MET-WR-204	B	MET-WR-11	MET-WS-3
TANT		B		

REFERENCE DRAWINGS	DWG. NO.
ELEV. PROCESS PIPING CELL PIT #6 SHT #1	E-57217
PLAN PROCESS PIPING CELL PIT #6	E-57216

NO.	REVISIONS	DATE	APPD	APPD	AEC
5	CHG'D. & RERAN LINE 3/8T-C7405Ta	3-1-67			
4	ADDED LINES 3/8T-P60806-SS, 3/8T-C60703-SS RELOCATED LINES 3/8T-T60204-Zr & 3/4T-T60201Zr	3-25-66			NR
3	ADDED DIM. TO CENTRIFUGE PIPING	3-14-66		FLP/BZ	NR
2	REROUTED LINES # 3/8T-C7405Zr & 3/8"T-C6503Zr TO GAMMA SPECTROMETER PLUG AND ADDED DETAILS 1 THROUGH 5	1-10-66			NR
1	ADDED CENTRIFUGE, F-61, TANKS, T-66 & T-602, AND CONNECTING LINES. CHANGED PARTS LIST AND ADDED SECTION #4	8-16-65		O.O.Y.	NR

No.	REVISION	APPD
9	ADDED LINE 1/2T-T7212 Zr & CHANGED ROUTING OF 3/8T-T60408 Ta	
8	GENERAL REVISION 7-24-70	
7	AS BUILT TO DATE 7-9-69	
6	ADDED H-604-1/2 T-T7908 Zr, 1/2"T-T7910 Zr & 3/8T-T4312 Zr; REROUTED 3/8"T-T60404; REPLACED TANK T-601 WITH T-604; UPDATED CENTRIFUGE PIPING	

NO.	REVISION	DATE		
15	SWAPPED DESIGNATIONS OF LINES 60430 & 60431. CHG'D. LINE Nº 7709 TO 1/2T-C 5C702 Zr. ADDED LINE 1/2T-C 5C701 Zr IN POS. 15.	8-1-78		
14	CHG'D. LINE Nº 1/2T-T7708 Zr TO 1/2T-T1011 Zr	5-17-74		8/23/74
13	ADDED LINE UP-610 Zr. REPLACED LINES 5802 & 5803. DELETED LINE 5809	7-10-73		
12	REMOVED LINE TAGGED P-72004. CHANGED 6007 TAG TO P-72004. REMOVED LINE P-72006. CHANGED LINE TAGGED C-7305 TO P-71004. REROUTED LINES 6508, 3407, 60402, 06-601, & REMOVED 3403	10-3-72		
11	ADDED NOTE THAT EXIST. 3/8T-T6007 TO BE TAKEN OUT OF SERVICE AND REPLACED BY JUMPER OF SAME Nº FROM T-60 TO LEFT BUNDLE	5-23-72		5/24/72
10	REVISED TO SHOW CHANGES IN NEW LEFT & RIGHT LINE BUNDLES	2-4-72		2/11/72
16	REMOVED LINE P-72004 FROM T-60 NOZ. G POSITION & REPLACED WITH LINE 6011. REROUTED LINE 60408 FROM T-604 NOZ. K TO POSITION 8 OF RIGHT SIDE LINE BUNDLE.	9-8-[illegible]		

DRAWN	DATE	SUBMITTED	DATE	APPROVED	DATE
MERVED	5-15-64		1-21-65		
DESIGNED	DATE	APPROVED	DATE	APPROVED	DATE
W.B.	1-21-65				
CHECKED	DATE	APPROVED	DATE	APPROVED	DATE
D.R.	1-21-65				

SECTION & DETAIL KEY: NUMBER OF SECTION OR DETAIL; DRAWING ON WHICH SECTION OR DETAIL IS TAKEN; DRAWING ON WHICH SECTION OR DETAIL IS SHOWN

310-100 121-100 A-70644-72

APPROVED: W.D. Burch (Rev. 0) UCC-NUCLEAR DIVISION DATE 2-11-65
APPROVED: L. H. JACKSON ATOMIC ENERGY COMMISSION DATE MAR 12 1965

MARKUP 2-27-2024

CLASSIFICATION

LIMITS ON DIMENSIONS UNLESS OTHERWISE SPECIFIED: FRACTIONS: ± 1/8" DECIMALS: ± ANGLES: ±

SCALE: 1/4" = 1"

TRANSURANIUM PROCESSING PLANT BLDG. NO. 7920

CELL PIT 6 PROCESS PIPING ELEVATION-SHT. #2

OAK RIDGE NATIONAL LABORATORY
OPERATED BY
UNION CARBIDE NUCLEAR COMPANY
DIVISION OF UNION CARBIDE CORPORATION
OAK RIDGE, TENNESSEE

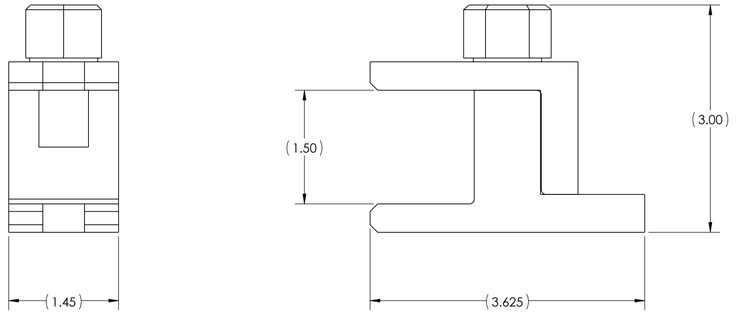
SUBMITTED | ACCEPTED | APPROVED O.O. Yarbro 2-11-65

E-57218 REV 16

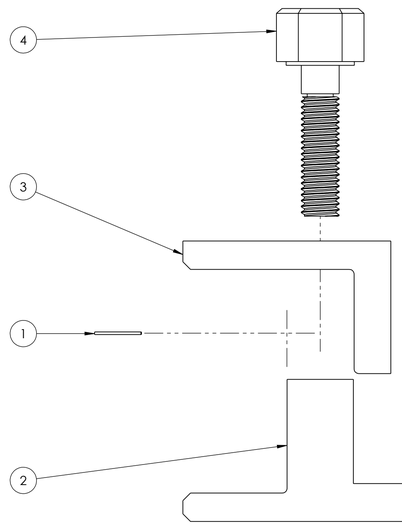
DIETZGEN NO. 127M DRAFTEX

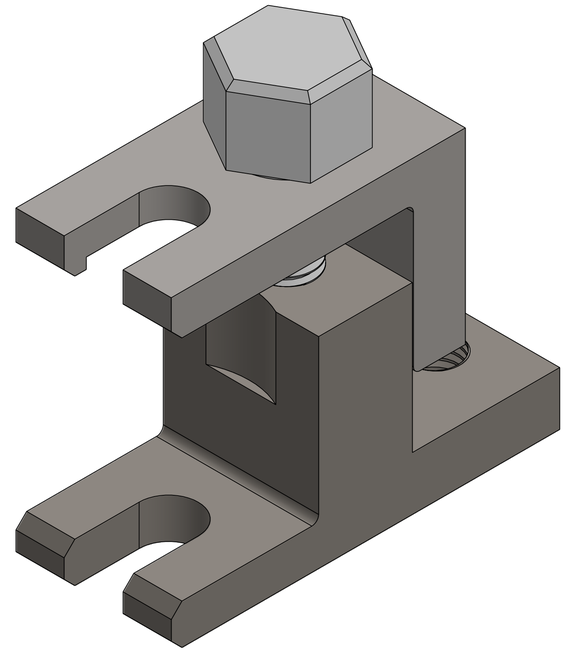
REVISION HISTORY			
REV.	DESCRIPTION	DATE	APPROVED BY
0	INITIAL RELEASE.	08/01/2024	S.HAWKINS

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	98408A136	MCMASTER-CARR RETAINING RING FOR 7/16 OD, 15-7 PH STAINLESS STEEL	1
2	M7920TT6508-P001	T-65 REPAIR TRU DISCONNECT BASE CLAMP	1
3	M7920TT6508-P002	T-65 REPAIR TRU DISCONNECT FERRULE CLAMP	1
4	M7920TT6508-P003	T-65 REPAIR TRU DISCONNECT CLAMP BOLT	1

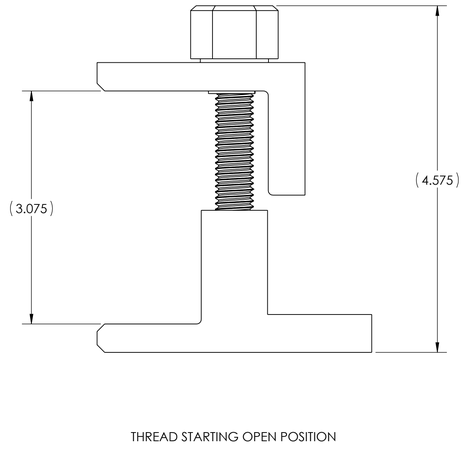


FULLY CLOSED POSITION





SCALE 2:1



THREAD STARTING OPEN POSITION

APPROVED FOR FABRICATION

UNLESS OTHERWISE SPECIFIED:		NAME	E-SIGNATURE / DATE
DIMENSIONS ARE IN INCHES	DRAWN BY:	S.HAWKINS	
TOLERANCES: FRACTIONS = ±1/64 X.XX DIMENSIONS = ±0.01 X.XXX DIMENSIONS = ±0.005 ANGLES = ±0.5°	CHECKED BY:	T.HARKENRIDER	
	ENG APPR.	S.HAWKINS	
	G.L. APPR.	W.KIRKLAND	
BREAK SHARP CORNERS TO 1/64 MAX	OPS. APPR.	Z.BURNS	
FINISH: 125 RMS	Q.A. APPR.		
INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5-2008			
THIRD-ANGLE PROJECTION	MATERIAL:		WEIGHT: 1.92 LBS

OAK RIDGE NATIONAL LABORATORY
MANAGED BY UT-BATTELLE
FOR US DEPARTMENT OF ENERGY
UNDER CONTRACT NO.
DE-AC05-00OR22725 OAK RIDGE, TN

DESCRIPTION:

T-65 REPAIR TRU DISCONNECT CLAMP ASSEMBLY

SIZE	PART NO.	REV
D	M7920TT6508-ASSY	0

SCALE: 1:1 | SHEET 1 OF 1

THIS DRAWING PRODUCED USING **SOLIDWORKS**

USQD Number: USQD/REDC/24-017
Revision Number: 0

UNREVIEWED SAFETY QUESTION DETERMINATION (USQD) CHANGE PACKAGE

Part I - Introduction

1. **Facility:** Radiochemical Engineering Development Center (REDC) Building 7920

2. **Subject of evaluation:** Reconnection of Process Line ⅜T-T6508-Zr to Hot Cell Evaporator Tank T-65

3. **Description of the change:**
Tank T-65 is located in hot cell tank pit 6. Tank T-65 is a about a 6 inch diameter by 4½ foot high cylindrical process tank with a capacity of about 22 liters. The tank shell is constructed of Hastelloy-C with a tantalum liner. The tank has 10 nozzle lines that are constructed of tantalum tubing that go down into the tank to various depths ranging from the bottom to the top of the tank and extend up about 3½ feet from the tank top end head plate to a disconnect support plate where they terminate in stainless steel female ferrule fittings. Various instrumentation/process/service lines with male ferrule fittings are connected to these nozzle lines using TRU disconnect clamps that are bolted onto the disconnect support plate. The TRU disconnect clamp consists of a Hastelloy-C bottom base block piece that holds the female ferrule fitting tube end and a top spring loaded stainless steel swing clamp piece that fits over the male ferrule fitting tube end. The swing clamp piece is attached with a stainless steel bolt to the base block piece and the bolt is tightened down to clamp the female and male ferrule fittings together. As a result of leaking lines to/from T-65, in 2023 the following repair work was performed and changes were made as addressed in USQD no. USQD/REDC/23-015. The process line ⅜T-T6508-Zr that was connected to the tank T-65 nozzle K (deep leg into bottom of tank for solution removal) was found to have a leak at the TRU disconnect clamp. This line was a solution uptake line from the tank to the hot cell cubicle 6 right equipment rack. Repair attempts to fix the leak were unsuccessful and resulted in the TRU disconnect clamp being broken beyond repair with the process line disconnected from the nozzle. As a result the nozzle K line was crimped in two places below the disconnect support plate permanently placing the nozzle K line from the tank out of service. The process line ⅜T-T6508-Zr was left disconnected with the disconnected end open into the tank pit. The TRU disconnect clamp for the tank T-65 nozzle line L (deep leg into bottom of tank for solution removal) that was connected to process line ½T-T6506-Zr was found to be damaged. This line was a solution transfer line from the tank to the waste header via a steam jet. During the course of a repair attempt, the disconnect clamp was further damaged beyond repair (bolt attaching swing clamp broke off at top side of base block) resulting in the process line ½T-T6506-Zr becoming disconnected from the nozzle line. The segment of process line ½T-T6506-Zr between the discharge of the steam jet and the waste header was disconnected at the TRU disconnect clamp on the waste header in tank pit 6 and a male ferrule plug fitting was installed in its place in female ferrule fitting at the disconnect. The tank T-65 nozzle L was left open to the hot cell tank pit. The process line ⅜T-T6507-Zr that was connected to the tank T-65 nozzle C2 was found to have a leak in its line segment in tank pit 6. This line was a solution addition line into the tank from the hot cell cubicle 4 back equipment rack. Instead of replacing the process line ⅜T-T6507-Zr segment in tank pit 6, the line segment was disconnected from the tank nozzle C2 and a male plug ferrule fitting installed into female ferrule fitting end of the nozzle at the TRU disconnect clamp. The other end of this line segment was disconnected at the TRU disconnect clamp on the tank pit 6 wall and the line segment was left in place in the tank pit. The process line ⅜T-T6502-Zr that connects to the tank T-65 nozzle B (deep leg into bottom of tank for solution removal) had a leak in its line segment in tank pit 6. This process line is a solution sampling/transfer line into hot cell cubicle 6. This line was replaced with a new line segment of the same construction. However, during the replacement, the bolts that mount the TRU disconnect bottom base block piece to the tank disconnect support plate were broken. With the disconnect base block piece being sandwiched between the base block pieces of two other disconnects the original line was able to be disconnected and the replacement line connected. To help keep the base block piece stay in place during this replacement activity, a C-shaped bracket fabricated out of ⅛ inch thick stainless sheet metal was installed onto the tank disconnect support plate. The bracket fit over lugs on the ends of the disconnect support plate. The bracket was left in place. Because the tank T-65 was now open to the hot cell tank pit through the deep leg nozzle L line, it is no longer being used as an evaporator tank and is only used for

solution storage. To prevent it from being used as an evaporator tank, the steam supply line to the tank T-65 heating/cooling jacket, line ½T-T6532-C, was disconnected in the chemical makeup area (MUA) room 213. Also the steam/air supply line to the steam jet, line ½T-T6534-C, was also disconnected in the MUA. The disconnection of these two lines in the MUA was addressed in USQD no. EUSQD/REDC/23-075. These lines, which in the MUA are constructed of ½ inch copper pipe with copper and brass/bronze sweated, compression, and threaded components (i.e., valves) and fittings, were cut at a convenient location and both ends sealed with brass/bronze compression cap/plug fittings.

This USQD evaluation addresses a change to remove the existing remaining segment of the process line ⅜T-T6508-Zr in tank pit 6 back to the TRU disconnect clamp (disconnect no. 26) on the end plate of the line bundle from cubicle 6 in the tank pit and install a new replacement line segment from the TRU disconnect clamp on the end plate to the TRU disconnect clamp of tank T-65 nozzle L. The existing line ⅜T-T6508-Zr is constructed of lengths of ⅜ inch Zircaloy-2 alloy tubing pieces welded together and with TRU disconnect male ferrule fittings on each end. The replacement line ⅜T-T6508-Zr will be constructed of lengths of ⅜ inch Zircadyne® 702 (Zr-702) alloy tubing pieces welded together and with TRU disconnect male ferrule fittings on each end. The use of Zircadyne® 702 (Zr-702) alloy tubing in place of the Zircaloy-2 alloy tubing, which is no longer available, for process lines in the hot cell tank pits is a change that was previously addressed in USQD no. USQD/REDC/10-023 and will not be addressed further in this USQD evaluation. To secure the end of the new line onto the base block of the tank T-65 nozzle L TRU disconnect clamp, a repair clamp assembly will be used. The repair clamp assembly consists of (1) a stainless steel base piece that will fit under the bottom and around the front of the TRU disconnect clamp base block and (2) a stainless steel ferrule clamp piece which will fit over the top side TRU disconnect clamp base block and the male end ferrule of the line and that will be attached and tightened down unto the repair clamp base piece using a stainless steel bolt to clamp the ferrule into the TRU disconnect clamp base block. The C-shaped bracket that was left in place on the tank T-65 disconnect support plate will be removed for the installation of the nozzle L repair clamp (it is no longer required and will be in the way of the repair clamp). With the tank T-65 nozzle L no longer open into the tank pit, tank T-65 will be returned to use as an evaporator tank. To return tank T-65 to use as and evaporator tank, the steam supply line ½T-T6532-C to the tank T-65 heating/cooling jacket will be connected back together using a brass/bronze union fitting in the MUA room 213. This change to replace the process line ⅜T-T6508-Zr and reconnect the steam supply line ½T-T6532-C is addressed in Balance of Plant Modification (BOPM) no. 7920-BOPM-452.

Additional changes will be made to remove the segments of the out of service process lines ½T-T6506-Zr and ½T-T6534-C from tank pit 6. Line ½T-T6534-C is the out of service steam supply line to the steam jet in line ½T-T6506-Zr and is open into the tank pit via the disconnected line ½T-T6506-Zr. Line ½T-T6534-C will be disconnected at the TRU disconnect clamp on the rear (south wall) of tank pit 6 and it and the already disconnected line ½T-T6506-Zr will be removed from the tank pit. The line ⅜T-T6507-Zr which is already disconnected at each of its ends will also be removed from the waste tank pit. All of the lines removed from the tank pit will be staged in the limited access area (LAA) room 120 for eventual disposal as solid waste.

4. Primary safety basis documents:

1. ORNL/7920/SAR Rev. 18, *Safety Analysis Report, Radiochemical Engineering Development Center Building 7920*, UT-Battelle, LLC.

2. ORNL/7920/SBS/2020-02 Rev. 4, *Safety Basis Supplement for the Receipt and Unloading of Several Drums with ^{238}Pu Loaded Special Form Capsules into Hot Cells*, UT-Battelle, LLC.

3. ORNL/NNFD/SSAR Rev. 20, *Oak Ridge National Laboratory Standardized Safety Analysis Report for Nonreactor Nuclear Facilities*, UT-Battelle, LLC.

4. ORNL/7920/TSR Rev. 10, Change No. 2, Change No. 3, Change No. 4, Change No. 5, Change No. 6, Change No. 7, Change No. 8, *Technical Safety Requirements, Radiochemical Engineering Development Center Building 7920*, UT-Battelle, LLC.

5. Safety analysis:
This USQD addresses changes to (1) replace and reconnect process line ⅜T-T6508-Zr in the hot cell tank pit 6 back to tank T-65, (2) remove other out of service process lines associated with tank T-65 from tank pit 6, and (3) in the MUA room 213 reconnect the steam line to the tank T-65 heating/cooling jacket to return tank T-65 back to use as an evaporator tank. This change does not introduce any new types or increased magnitude of hazards/energy sources that can (1) initiate any new types of accident events or exacerbate the consequences of any existing accident events evaluated in the Building 7920 safety basis (SB) documentation or (2) initiate malfunctions/failures structures, systems, or components (SSCs) or exacerbate the consequences of malfunctions/failures of SSCs. Until 2023 tank T-65 was an evaporator tank with steam supplied to its heating/cooling jacket and there are also other existing evaporator tanks with steam supplied to their heating/cooling jackets in tank pit 6 and other hot cell tank pits. No safety-class, safety-significant, or defense-in-depth SSCs are directly affected by this change. The hot cell tank pit tanks, associated instrumentation/process/service lines in the hot cell cubicles, tank pits, and MUA, and the building steam system are not identified as safety-class, safety-significant, or defense-in-depth SSCs in the Building 7920 SB documentation. There is only one accident event evaluated in the Building 7920 SB documentation potentially affected by this change. This is event no. A.6 in Table 3.4 of the Building 7920 Safety Analysis Report (SAR). This event is identified as "Simple spills and leaks of radioactive solutions in cell tank pit" with a frequency identified as "anticipated" ($>10^{-2}$ per year) and potential causes listed as "Spill or leak of solution from piping or tank" and "Leak of pressurized solution from piping." The unmitigated consequence is identified as "moderate" to the co-located on-site personnel and the off-site public with the mitigated consequence as "negligible" by crediting the hot cell confinement structure and associated ventilation confinement provided by the cell off-gas (COG) system and vessel off-gas (VOG) system. This change will not affect the frequency or consequences of this event as evaluated in the SAR. The frequency and consequence was not based on any specific construction details (e.g., fitting connections and types, materials of construction, specific lengths/routing in the tank pits) of the process piping. Also (1) the new replacement line will be constructed of lengths of ⅜ inch zirconium alloy tubing pieces welded together and with TRU disconnect ferrule fittings on each end, the same as the existing line and (2) the repair clamp for the tank T-65 nozzle L TRU disconnect is constructed of stainless steel, the same as the swing clamp it replaces, performs the same function as the swing clamp, uses a stainless steel bolt to clamp it together the same as the swing clamp, and thus will be no more likely to malfunction/fail than the swing clamp. No changes to the Building 7920 SB documentation are required for this change. The tanks and associated instrumentation/process/service lines in the hot cell tank pits are not described or discussed at a level of detail that is affected by this change.

6. Does the proposed change require revision of Technical Safety Requirements (TSR) or affect a U.S. Department of Energy (DOE) Condition of Approval? Yes__ No X
If yes, then DOE approval is required.

7. Does the change make any changes to the documented safety analysis? Yes__ No X
If yes, specify changes and attach.

Part II - USQD

1. Could the change increase the probability of occurrence of an accident previously evaluated in the documented safety analysis? Yes__ No X
Justification:
This USQD addresses changes to (1) replace and reconnect process line ⅜T-T6508-Zr in the hot cell tank pit 6 back to tank T-65, (2) remove other out of service process lines associated with tank T-65 from tank pit 6, and (3) in the

MUA room 213 reconnect the steam line to the tank T-65 heating/cooling jacket to return tank T-65 back to use as an evaporator tank. As discussed in the safety analysis (Part 1, Item 5) of this USQD, this change does not introduce any new types or increased magnitude of hazards/energy sources that can (1) initiate any new types of accident events or exacerbate the consequences of any existing accident events evaluated in the Building 7920 SB documentation or (2) initiate malfunctions/failures SSCs or exacerbate the consequences of malfunctions/failures of SSCs. There is only one accident event evaluated in the Building 7920 SB documentation potentially affected by this change. This is event no. A.6 in Table 3.4 of the Building 7920 SAR. This event is identified as "Simple spills and leaks of radioactive solutions in cell tank pit" with a frequency identified as "anticipated" ($>10^{-2}$ per year) and potential causes listed as "Spill or leak of solution from piping or tank" and "Leak of pressurized solution from piping." The unmitigated consequence is identified as "moderate" to the co-located on-site personnel and the off-site public with the mitigated consequence as "negligible" by crediting the hot cell confinement structure and associated ventilation confinement provided by the COG system and VOG system. This change will not affect the frequency of this event as evaluated in the SAR. The frequency was not based on any specific construction details (e.g., fitting connections and types, materials of construction, specific lengths/routing in the tank pits) of the process piping. Also (1) the new replacement line will be constructed of lengths of ⅜ inch zirconium alloy tubing pieces welded together and with TRU disconnect ferrule fittings on each end, the same as the existing line and (2) the repair clamp for the tank T-65 nozzle L TRU disconnect is constructed of stainless steel, the same as the swing clamp it replaces, performs the same function as the swing clamp, uses a stainless steel bolt to clamp it together the same as the swing clamp, and thus will be no more likely to malfunction/fail than the swing clamp. Thus, this change will not increase the probability of occurrence of any accidents previously evaluated in the documented safety analysis.

2. **Could the change increase the consequences of an accident previously evaluated in the documented safety analysis?** Yes__ No X

Justification:

This USQD addresses changes to (1) replace and reconnect process line ⅜T-T6508-Zr in the hot cell tank pit 6 back to tank T-65, (2) remove other out of service process lines associated with tank T-65 from tank pit 6, and (3) in the MUA room 213 reconnect the steam line to the tank T-65 heating/cooling jacket to return tank T-65 back to use as an evaporator tank. As discussed in the safety analysis (Part 1, Item 5) of this USQD, this change does not introduce any new types or increased magnitude of hazards/energy sources that can (1) initiate any new types of accident events or exacerbate the consequences of any existing accident events evaluated in the Building 7920 SB documentation or (2) initiate malfunctions/failures SSCs or exacerbate the consequences of malfunctions/failures of SSCs. There is only one accident event evaluated in the Building 7920 SB documentation potentially affected by this change. This is event no. A.6 in Table 3.4 of the Building 7920 SAR. This event is identified as "Simple spills and leaks of radioactive solutions in cell tank pit" with a frequency identified as "anticipated" ($>10^{-2}$ per year) and potential causes listed as "Spill or leak of solution from piping or tank" and "Leak of pressurized solution from piping." The unmitigated consequence is identified as "moderate" to the co-located on-site personnel and the off-site public with the mitigated consequence as "negligible" by crediting the hot cell confinement structure and associated ventilation confinement provided by the COG system and VOG system. This change will not affect the consequences of this event as evaluated in the SAR. The consequence was not based on any specific construction details (e.g., fitting connections and types, materials of construction, specific lengths/routing in the tank pits) of the process piping. Thus, this change will not increase the consequences of any accidents previously evaluated in the documented safety analysis.

3. **Could the change increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the documented safety analysis?** Yes__ No X

Justification:

This USQD addresses changes to (1) replace and reconnect process line ⅜T-T6508-Zr in the hot cell tank pit 6 back to tank T-65, (2) remove other out of service process lines associated with tank T-65 from tank pit 6, and (3) in the MUA room 213 reconnect the steam line to the tank T-65 heating/cooling jacket to return tank T-65 back to use as an evaporator tank. As discussed in the safety analysis (Part 1, Item 5) of this USQD, this change does not introduce

any new types or increased magnitude of hazards/energy sources that can (1) initiate any new types of accident events or exacerbate the consequences of any existing accident events evaluated in the Building 7920 SB documentation or (2) initiate malfunctions/failures SSCs or exacerbate the consequences of malfunctions/failures of SSCs. Also, no safety-class, safety-significant, or defense-in-depth SSCs are directly affected by this change. The hot cell tank pit tanks, associated instrumentation/process/service lines in the hot cell cubicles, tank pits, and MUA, and the building steam system are not identified as safety-class, safety-significant, or defense-in-depth SSCs in the Building 7920 SB documentation. Thus, this change will not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the documented safety analysis.

4. **Could the change increase the consequences of a malfunction of equipment important to safety previously evaluated in the documented safety analysis?** Yes__ No X
Justification:
This USQD addresses changes to (1) replace and reconnect process line ⅜T-T6508-Zr in the hot cell tank pit 6 back to tank T-65, (2) remove other out of service process lines associated with tank T-65 from tank pit 6, and (3) in the MUA room 213 reconnect the steam line to the tank T-65 heating/cooling jacket to return tank T-65 back to use as an evaporator tank. As discussed in the safety analysis (Part 1, Item 5) of this USQD, this change does not introduce any new types or increased magnitude of hazards/energy sources that can (1) initiate any new types of accident events or exacerbate the consequences of any existing accident events evaluated in the Building 7920 SB documentation or (2) initiate malfunctions/failures SSCs or exacerbate the consequences of malfunctions/failures of SSCs. Also, no safety-class, safety-significant, or defense-in-depth SSCs are directly affected by this change. The hot cell tank pit tanks, associated instrumentation/process/service lines in the hot cell cubicles, tank pits, and MUA, and the building steam system are not identified as safety-class, safety-significant, or defense-in-depth SSCs in the Building 7920 SB documentation. Thus, this change will not increase the consequences of a malfunction of equipment important to safety previously evaluated in the documented safety analysis.

5. **Could the change create the possibility of a different type of accident than any previously evaluated in the documented safety analysis?** Yes__ No X
Justification:
This USQD addresses changes to (1) replace and reconnect process line ⅜T-T6508-Zr in the hot cell tank pit 6 back to tank T-65, (2) remove other out of service process lines associated with tank T-65 from tank pit 6, and (3) in the MUA room 213 reconnect the steam line to the tank T-65 heating/cooling jacket to return tank T-65 back to use as an evaporator tank. As discussed in the safety analysis (Part 1, Item 5) of this USQD, this change does not introduce any new types or increased magnitude of hazards/energy sources that can (1) initiate any new types of accident events or exacerbate the consequences of any existing accident events evaluated in the Building 7920 SB documentation or (2) initiate malfunctions/failures SSCs or exacerbate the consequences of malfunctions/failures of SSCs. Thus, this change will not create the possibility of a different type of accident than any previously evaluated in the documented safety analysis.

6. **Could the change create the possibility of malfunction of equipment important to safety of a different type than any previously evaluated in the documented safety analysis?** Yes__ No X
Justification:
This USQD addresses changes to (1) replace and reconnect process line ⅜T-T6508-Zr in the hot cell tank pit 6 back to tank T-65, (2) remove other out of service process lines associated with tank T-65 from tank pit 6, and (3) in the MUA room 213 reconnect the steam line to the tank T-65 heating/cooling jacket to return tank T-65 back to use as an evaporator tank. As discussed in the safety analysis (Part 1, Item 5) of this USQD, this change does not introduce any new types or increased magnitude of hazards/energy sources that can (1) initiate any new types of accident events or exacerbate the consequences of any existing accident events evaluated in the Building 7920 SB documentation or (2) initiate malfunctions/failures SSCs or exacerbate the consequences of malfunctions/failures of SSCs. Also, no safety-class, safety-significant, or defense-in-depth SSCs are directly affected by this change. The hot cell tank pit tanks, associated instrumentation/process/service lines in the hot cell cubicles, tank pits, and

MUA, and the building steam system are not identified as safety-class, safety-significant, or defense-in-depth SSCs in the Building 7920 SB documentation. Thus, this change will not create the possibility of malfunction of equipment important to safety of a different type than any previously evaluated in the documented safety analysis.

Part III - Conclusion and Approval

Based on the responses above, the change:

X does NOT constitute an unreviewed safety question
__ does constitute an unreviewed safety question

Preparer: M. A. Green Date

Independent Reviewer: B. G. Roden Date

Approvals:

R. J. Weaver, REDC Facility Manager Date

Not applicable
N. L. Blair for Date
Nuclear Facility Safety Program Lead
Nuclear Facility Safety Division