

PER TRI REACTORS TOTAL OUTAGE PROCEDURE

DATE: ____/____/____

WORK ORDER NO. _____

INSTRUCTIONS:

This form is to be returned to Per-Tri reactor foreman after all the jobs have been completed. The form itself is a reminder and a guideline for the foreman/mechanic, and operators. It is also a record for operations. Please indicate the date when the job was completed on the blank provided. Because there will be interaction between maintenance and operations, the foreman following the jobs or the lead operator is to sign and date the form prior to returning it to the other. This form is to be attached to the REACTOR ISOLATION AND TAGGING CHECKLIST and to the RXSOP112 but will become independent after the outage begins. At the end of the packet you will find a blank form. This form is to record information relevant to the outage, ie. IF OPERATIONS BECOMES AWARE THAT A VALVE NEEDS TO BE REPLACED OR THAT A NOZZLE NEEDS TO BE UNPLUGED, this information is to be written on this form immediately.

MATERIAL NEEDED

1. Operating air compressor with full fuel tank
2. Two operating fork trucks with full fuel tank
3. 45 drums with lids and rings
4. Roll of visqueen
5. Two low voltage light cords and two spare bulbs
6. Low voltage transformer and extension cord
7. Fire hose and tank washer
8. 10 blue drums with lids and rings

PREPARATIONS (Must be completed prior to the schedule outage date)

- ____ 1. Park air compressor away from scrubber area
- ____ 2. Clear area where vacuum truck will be parked (it must be within contained area)
- ____ 3. Locate pallets/drums/lids on road south of reactors
Identify the drums as "USED CATALYST"
"NO. ____ PER TRI REACTOR"
- ____ 4. Connect and test low voltage lights
- ____ 5. Build scaffolds to remove heads
- ____ 6. Review procedures with mechanics
- ____ 7. Clear blasting area
- ____ 8. Build platform to unbolt organics to vaporizer from main header
- ____ 9. Build platform to remove dowtherm SRV
- ____ 10. Move reactor head racks South of reactor's area
- ____ 11. Schedule instrument mechanics and insulators to disconnect thermocouples and remove heads/piping insulation

TAGGING (To be done the morning the outage starts)

- ___ 1. Complete REACTOR ISOLATION AND TAGGING CHECKLIST
- ___ 2. Hang checklist and reactor number tag on I-Beam West of stairway according to LOCK AND TAG procedure
- ___ 3. Maintenance and operations to update tagging checklist daily

PREPARATIONS TO REMOVE CATALYST USING VACUUM TRUCK

- ___ 1. Remove rupture disks/stacks
- ___ 2. Remove reactor vapor line (includes the line from cyclone to primary condenser(s) Set lines by the blasting wall in a way that the blasters would be able to clean all sections. Remove pancake blind and sacrificial spools. Leave room for Rx heads.
- ___ 3. Cover grating hole by cyclone inlet
- ___ 4. Install pulley to hold dumping hose
- ___ 5. Hang metal hoses so that vacuum truck hoses could be connected to such hoses

DATE: ___/___/___
TIME: _____

FOREMAN: _____

NOTIFY REACTOR FOREMAN SO THAT VACUUM TRUCK COMPANY COULD BE NOTIFIED.

PREPARATIONS TO HYDROBLAST SYSTEM

REACTOR

- ___ 1. Remove feed piping and heads
- ___ 2. Disconnect nitrogen tubing to individuals and rod-out each tube (to be done simultaneously with item #1)
- ___ 3. Remove dome thermowells
- ___ 4. Remove catalyst addition pot (including valves)
- ___ 5. Remove blind from charging nozzle
- ___ 6. Remove bayonets and cover condensate nozzles black tape to prevent plugging. Remove drain piping (2) on horseshoe
- ___ 7. Remove mixing tee

VAPORIZER

- ___ 1. Remove vaporizer reboiler
- ___ 2. Remove pad-out header valves/blinds/plugs so that blasters can clean every section of piping. Also, remove pump bowl cover
- ___ 3. Remove vaporizer drum manway, float chambers
- ___ 4. Roll out blowdown (automatic) valve
- ___ 5. Remove demister drum
- ___ 6. Remove rupture disks and SRVs (Follow SOP for D/T)

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- ___ 7. Remove vaporizer drum LCV and roll out bypass valve
- ___ 8. Remove organics orifice plate (disconnect impulse lines and cap them to allow water out of this system). Drop spool on #1 vaporizer from orifice to organic headers. On the others, drop small spool at the headers so that blasters can clean the piping
- ___ 9. Break flanges apart on organic inlet to drum
- ___ 10. Remove valve between cyclone and catch pot
- ___ 11. Remove catch pot drain line at the pot

NOTE: When these jobs are marked as done and the foreman returns this form signed, it will be an indication that no tags are in place that could prevent the blasting of any piece of equipment/piping within the reactor or vaporizer system.

DATE: ___/___/___
TIME: _____

FOREMAN: _____

NOTIFY THE PLANNER SO THAT HYDROBLASTING TRUCK COMPANY CAN DO THEIR JOB

BLASTERS TO CLEAN SYSTEM PER LIST IN CONTROL ROOM
WASH FEED PIPING

The return of this list to the maintenance foreman will signal that the blasting job was done to satisfaction unless specific instructions were given to him (use last page)

DATE: ___/___/___
TIME: _____

REACTOR FOREMAN: _____
ESPECIAL NOTES WRITTEN: YES NO

- ___ 1. Install flange with hose connector to mixed feed header
- ___ 2. Install bayonets or blinds

NOTE: When these jobs are done and the maintenance foreman returns this form signed, it will be an indication that no tags are in place that could delay the washing and nitrogen checking by operations that evening or as indicated at that time. See RXSOP112 (attached) for details.

DATE: ___/___/___
TIME: _____

FOREMAN: _____

NOTIFY REACTOR FOREMAN SO THAT OPERATORS COULD BE INSTRUCTED ON WHAT TO DO AND WHEN

- ___ 3. Operators to wash feed piping and check individual nitrogen per SOP
- ___ 4. Recorded findings from the operation above on the list at the end of the packet

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NOTE: When the washing and checking is completed and this form is signed, it will indicate that any problems found with this system has been properly documented in the operations logbook and that any valves needing replacement has been properly identified outside with a tag. Any findings that requires maintenance action (such as rodding out individuals, changing tubings, etc) are also identified with a notice tag.

DATE: ____/____/____
TIME: _____

LEAD OPERATOR: _____

PREPARATIONS TO WASH PRIMARY CONDENSERS

- ____ 1. Roll out piping below primary and secondary condensers
- ____ 2. Remove primary condenser(s) inlet spool and install _____
- ____ 3. Remove tee bypass and install blinds
- ____ 4. Connect washing hose (water inlet, use fire hydrant East of refrigeration unit) and drain hose to collection pan. The hose connector should be equipped with a nitrogen fitting.
- ____ 5. Wash condenser(s)
Check with operations prior to using any water if done by maintenance.
- ____ 6. Remove tee from top of condenser(s) for inspection
- ____ 7. Notify maintenance coordinator that the system is ready for an overall inspection (piping and bolts integrity, plugging, etc.) Maintenance will be informed of any action required after the inspection
- ____ 8. Open barometric condenser and break drain piping flanges for inspection

NOTE: When these jobs are done and the maintenance foreman signs off this list, it indicates the condenser(s) have been properly prepared for washing by operations if the washing was to be done on back shifts or that the condenser(s) is/are ready for operations approval.

DATE: ____/____/____

FOREMAN: _____

NOTE: Checking the condition of the primary condenser(s) piping is an integral part of the routine inspection for this system. When the RX foreman signs this form it indicates the acceptance of the condenser(s) wash job and signals maintenance that the job can continue.

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ASSEMBLING REACTOR

- ____ 1. Verify that the hydroblasting list has been fully completed and accepted (signed)
- ____ 2. Verify that all repairs required during inspection

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- _____ were completed to satisfaction
- _____ 3. Verify that all the individual nitrogen connections/ piping has been rod-out.
- _____ 4. Verify that all instrument work on the oxygen rotameters have been completed
- _____ 5. Verify that primary condenser(s) tee(s) are clean and satisfactory

NOTE: Both maintenance and operations agreement is required prior to assembling the system

DATE: ____/____/____ FOREMAN: _____
RXS' FOREMAN: _____

- _____ 6. Install reactor rupture disk stacks after being repaired per SOP
- _____ 7. Install reactor heads and feed piping after flow checking each nozzle
- _____ 8. Close up vaporizer drum and blowdown piping (pump bowl must be clean and dry)
- _____ 9. Install vaporizer reboiler
- _____ 10. Install mixing tee, bayonets, and drain piping on horse-shoe
- _____ 11. Install vapor lines (Primary inlet spools must be verified as good by dye check)
- _____ 12. Button up primary condenser(s)
- _____ 13. Close barometric condenser and button up drain line
- _____ 14. Connect pressure transmitters
- _____ 15. Update REACTOR ISOLATION AND TAGGING CHECKLIST to allow operating valves required for leak check

NOTE: Before signing this section the maintenance foreman is required to check the system at the field to verify that nothing has been overlooked. At that time a housekeeping inspection is to be completed by the foreman as to correct deficiencies while operators perform the leak check. Notify reactor foreman at the time that you return this form to the lead operator.

DATE: ____/____/____ FOREMAN: _____
TIME: _____

NOTE: Operators are to leak check the system according to SOP or special instructions at the time of leak check

- _____ 16. Leak check per list
- _____ 17. Notify reactor foreman or maintenance foreman about any leaks. Identify leaks with tags.
- _____ 18. Leak check completed after all leaks found were fixed
- _____ 19. Untag and deactivate REACTOR ISOLATION AND TAGGING CHECKLIST

NOTE: Signing this list indicates that there are no leaks

and that maintenance can continue with their outage work

DATE: ____/____/____

LEAD OPERATOR: _____

- ____ 20. Hook up thermocouples (check proper hookup with L&N
- ____ 21. Connect charging hose from transporting header to reactor. Verify the system since there is a difference between #1 reactor and the others.
- ____ 22. Connect organics feed flow transmitter impulse lines and fill them up with organics
- ____ 23. Drain reactor vent flow transmitter impulse lines
- ____ 24. Insulate system
- ____ 25. Connect catalyst blowdown hose
- ____ 26. Finish cleanup of working area

NOTE: Signing this list indicates the completion of the reactor total outage meaning that a final inspection was made to ensure the integrity of the system worked on. (All expansion joints were properly lined-up and with cover installed. lines properly supported. all tags removed. etc.)

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FOREMAN: _____

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IMPORTANT NOTES

1. After removing the vapor lines from the reactor, remove the pressure transmitters block valve. Secure valves to the piping with a piece of wire. The purpose of the removal is to be able to clean the nozzles.
2. Tag and secure the bayonets drain piping. New piping had to be fabricated during the last two outages because the old one was lost.
3. The system is not considered finish until the insulation job is completed. (this could be wrapped with temporary insulation)

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NO. ____ REACTOR TOTAL OUTAGE

INSTRUCTIONS:

As the system is checked new miscellaneous items will be found that were impossible to be detected earlier. Log these items on this page. date each item. No modifications desires are to be included on this form. Contact the unit foreman or the maintenance coordinator for improvements or suggestions.

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