

SAFE WORK PLAN**STAN MAYFIELD BIOREFINERY PILOT PLANT**

A. Scope

This document is used to ensure that all necessary steps for isolating equipment, accessing areas and advising workers of potential risks are completed prior to beginning any work. The Safe Work Permit (SWP) is designed to ensure that proper safety precautions are taken before, during, and after any type of work is performed on plant equipment by University of Florida employees or contract personnel. The SWP incorporates and is supported by existing documents; Lock-out/Tag-out (LO/TO), Hot Work (Welding/Grinding/Open Flame procedures), electrical safety procedures, and contractor guidelines.

All process isolation LO/TOs and equipment name and/or numbers must be listed in the SWP before the equipment is serviced or maintained. Also, all employees who will be working on the equipment are required to sign the SWP. Prior to work beginning, the shift manager shall make sure that the appropriate safety training in LO/TO procedures has been received by all personnel expected to be involved in the work.

B. Definitions

Authorized associate: This is an associate who performs servicing or maintenance on equipment and machinery and is able to isolate them implementing lock-out/tag-out procedure.

LO/TO: Lock-out/Tag-out procedure that is used to control electrical, mechanical, and thermal hazards, and hazardous potential (stored) energy so that equipment can be safely worked on.

Servicing and/or Maintenance: Activities such as constructing, installing, setting up, adjusting, inspecting, modifying, maintaining, or servicing machines or equipment. These activities include lubricating, cleaning, clearing jams, and making tool adjustments.

Shift Manager: Individual in charge of approving all operations during the shift, including all SWP, and implementing LO/TO procedures.

Responsible Repair Person: An individual who is part of a work group and is able to obtain a SWP and verify the placement of locking devices/tags in order to ensure the safety of the group from hazardous energy. The Responsible Repair Person could be the contractor.

Verifier: A second person to confirm that the required valves as determined by the Shift Manager are in the right position and locked/tagged, and breakers are thrown and locked/tagged. The verifier is not responsible for verifying the accuracy of the isolation plan, but is providing a second visual check. The Verifier may be the Responsible Repair Person.

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C. Safety Requirements

Refer to UF Biosafety guidelines and the NIH Guidelines for Research Involving Recombinant DNA Molecules whenever biological cultures/genetically modified organisms are handled or present in the equipment.

Review the location of fire extinguishers, fire blankets, safety showers, eye wash stations, first aid equipment, spill cleanup equipment, and protective gear before beginning any process work.

During operations in the plant, the following safety gear will be utilized at all times:

- Safety Glasses or Goggles
- Protective Gloves
- Hard Hat

D. Related Documents and SOPs

1. First Break Procedure
2. LO/TO Procedure
3. Hot Work Permit
4. Safe Work Permit (SWP)

E. Preparation/Materials/Equipment

1. General safety requirements

F. Detailed Procedure

1. The Safe Work Permit System applies any time it is determined that equipment repairs are necessary.
2. New SWPs must be written or reissued for each new working group or shift to ensure that the proper precautions are being maintained and that the list of workers is accurate.
3. Only the Shift Manager can issue SWPs.
 - a. The Shift Manager is responsible for outlining the isolation plan, placing locks/tags to make sure all systems are properly isolated, and issuing the SWP.
 - b. In addition, the Shift Manager is responsible for reviewing the SWPs already issued for work in the area, to ensure workers are not going to affect one another.
 - c. A completed copy of the permits for work (Isolation Plans, Confined Space, Hot Work, etc.) that has been completed will be kept in record, along with the SWP, for a period of one year.
4. If confined space entry is required, the work will be carried out by an outside contractor.

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NOTE: Confined space entry work cannot be performed by University of Florida employees. All confined space entry work has to be carried out by an outside contractor.

- a. The Shift Manager will apprise the contractor of any hazards identified, any experience with the space and precautions or procedures necessary for employee protection.
 - b. Contractors performing confined space entry must inform the Shift Manager of the confined space entry program that will be followed and any hazards confronted or created in the space.
 - c. Contractors are expected to comply with the Occupational Safety and Health Administration(OSHA) Permit-required Confined Space Standards and are expected to:
 - i. Have a confined space entry program in place that meets the OSHA requirements,
 - ii. Ensure their employees are properly trained, and
 - iii. Have the equipment and resources available to ensure a safe entry.
5. All persons responsible should review the safe practices for the required work to insure that all safety precautions have been taken into account.

NOTE: Any process equipment/piping that has contained an rDNA organism MUST be treated to inactivate viable organisms prior to opening.

6. The Responsible Repair Person (electrical, instrument, mechanical, contractor, or other) is responsible for insuring that he/she obtains a SWP before beginning work and insuring that proper locks have been placed on the isolation devices for the work to be done.
 - a. When requesting a Safe Work Permit, the Responsible Repair Person must clearly communicate the nature and scope of the work that is to be done so that the Shift Manager can determine if the proper safe isolation for the job is in place.
 - b. The Responsible Repair Person must sign the permit for themselves or a craft/work crew and will have their name listed in the SWP.
 - c. The Responsible Repair Person must communicate to their crew all safety hazards, safety procedures, and PPE required.
7. The Verifier will visually verify that all isolations are completed with all valves and breakers locked/tagged in the position required by the isolation plan. The Verifier must sign on the Safe Work Permit, even if the Verifier is the Responsible Repair Person.
8. The Shift Manager signs the SWP as a final step.
 - a. It is not to be signed until the Shift Manager;
 - i. Reviews the entire permit,
 - ii. Has verified that the isolation is correct,

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- iii. Has reviewed the Confined Space Entry Permit provided by the contractor (if required),
 - iv. The verifier has signed the permit or isolation plan, and
 - v. Gives the person getting the permit all the needed information.
 - b. The Shift Manager is to ensure that the communications are clear. Upon execution of the permit, it becomes an official document.
- 9. A copy of the SWP will be given to the Responsible Repair Person and the original (with all supporting documents) will be kept on file in the control room.
- 10. Changing required equipment or isolation items, such as adding LO/TO locations after the permit is issued, is not acceptable. If these type of changes need to be made, then a new permit will be initiated and the old one canceled.
- 11. While the work is being performed, the person doing the work will display the SWP at the point where the work will occur.
- 12. In the event that the task cannot be completed by the person performing the work, it is his/her responsibility to insure that the status of the job and safety precautions taken are communicated to his/her replacement and that the SWP is turned in to the Shift Manager.
 - a. The oncoming repairperson is required to obtain a SWP and insure that the system is safe and properly isolated for work.
- 13. When the Shift Manager is relieved, it is the off going operator's responsibility to review the status of any outstanding SWP's in the plant. It is the oncoming operator's responsibility to ensure that conditions continue to exist so that the work can be done safely.
- 14. When the work is completed,
 - a. The Responsible Repair Person is expected to ensure that all of the workers and equipment are clear and that the equipment is safe to start up.
 - b. The person performing the work brings the SWP to the control room and gives it back to the Shift Manager.
- 15. The Shift Manager would then verify that the system is ready for operation, unlock the equipment and/or remove tags, and put said system back into service.