



Standard Operating Procedure Yeast Tub Process Management			
Date Issued XX/XX	Document # 401.10.MILL.011	Version X.X	Page 1 of 6

Approved By:

Name Safety Director Date

Name Still House Superintendent Date

<i>Summary of Current Changes and Reason for Revision</i>		
Date	Version Number	Reason
	1.0	Initial Issue

- **Warnings:** Procedural steps where personal injury or equipment damage could result.
- ▲ **Cautions:** Procedural steps where damage to equipment or product could occur.
- **Notes:** Additional procedural or administrative details.

Yeast Tub Process Management

Date Issued
XX/XX

Document #
401.10.MILL.011

Version
X.X

Page
2 of 6

1.0 Scope

This SOP outlines the procedures for filling, cooling, washing, sewerage, and venting a Tub. Additionally, instructions for yeasting props, taking tub samples, and taking tub readings are provided.

2.0 Safety, Environmental and Quality

2.1 Safety

2.1.1 Standard PPE is required for all field task performed in this procedure. Verify all team members don proper PPE.

- Gloves
- Hearing protection
- Hard hat
- Company issued sealed safety eyeglasses
- Steel toed boots
- Long sleeved shirt and long pants

2.1.2 Some hazards this procedure may expose an operator to include:

- **Poor lighting:** Use caution in areas with poor lighting and carry a flashlight.
- **Eye Strain:** Use other tasks to break up long durations of computer tasks
- **Back Strain:** Stretch before any lifting, practice good posture
- **Low Headroom:** Use caution, do not rush, and keep eyes on path
- **Uneven Surfaces:** Use caution, do not rush, and keep eyes on path
- **Hot water:** Be aware of line of fire when and contact surface when working with wash water
- **Stairs:** Use handrails, take one step at a time do not rush, and keep eyes on path
- **Slippery Surfaces:** Use caution, do not rush, and keep eyes on path
- **Ladders:** Use caution, do not rush, and keep eyes on path
- **Low pH Mash:** Be aware of line of fire when and splashing when working with and around mash
- **CO2:** Always have a buddy when investigating possible CO2 leaks. If you are in a area where CO2 is overwhelming, leave the area and report it to a supervisor.
- **Pinch Points:** Use caution when turning valves, or using tools, be aware of your hand placement. Never remove or bypass guards on moving machinery without the proper lock out.
- **Hot Surfaces:** use caution when working around hot surfaces such as steam lines and wash water lines.

Yeast Tub Process Management

Date Issued
XX/XX

Document #
401.10.MILL.011

Version
X.X

Page
3 of 6

2.2 Environmental

- 2.2.1 IMMEDIATELY REPORT AND DOCUMENT any uncontrolled release of CO₂.
- 2.2.2 IMMEDIATELY REPORT AND DOCUMENT any uncontrolled flow of mash out of the bottom of a tub.

2.3 Quality

- 2.3.1 ENSURE temperatures are maintained in the proper range during the life of a tub set.
- 2.3.2 ENSURE that all tub sets receive the proper length of wash and steam.
- 2.3.3 ENSURE that yeast and enzyme dosages are added in the exact amounts specified.

3.0 Definitions, Tools/Equipment and Supplies

3.1 Definitions

- **CO₂**: Toxic gas given off during propagation of yeast
- **Fill**: Pumping mash into a tub.
- **Mash**: Corn and water slurry mixed with, enzyme, fertilizer, sulfuric acid, and backset.
- **Setting a tub**: Pumping mash to a tub mixing in fertilizer, slurry yeast and enzymes.
- **Sewer**: Draining wash water to "A" process
- **Steam**: Used to sterilize tub.
- **Wash**: Cleaning a tub with MR condensate.
- **Wash Water**: Hot MR evaporator and distillation condensate

3.2 Tools, Equipment and Supplies

3.2.1 Tools

There are several tools needed to perform this SOP. The most common are:

- Flashlight
- Adjustable Pliers

3.2.2 Equipment

This SOP affects or involves many types of equipment. Below, is a list of the most significant types of equipment:

Yeast Tub Process Management

Date Issued
XX/XX

Document #
401.10.MILL.011

Version
X.X

Page
4 of 6

- Sample Carrier

3.2.3 Supplies

List the required supplies for this SOP:

- Sample Tube
- Sample Cup

4.0 Procedures

4.1 Startup

4.1.1 Verify Initial conditions for startup.

- ENSURE that cooling water, slurry yeast, and fertilizer sources are available.
- ENSURE that the Mash has been properly cooked. Before setting a Tub:
 - TEMPERATURE must be at least 230 degF, and
 - DRY SOLIDS must be above a 25%.
- Shut steam OFF on Totalvision graphics page 1106:
 - CLICK on the TUBSEQ button.
 - SELECT – LOCKOUT to close the automatic valves to the steam header.
- Shut MANUAL Steam Valve OFF in the field at the steam tree.

4.2 Setting or (Filling) a Tub.

4.2.1 Set Up Manual Valves.

- OPEN the Manual Fill Valve on the selected Tub.
- OPEN remaining manual valves to isolate the tub you are going to fill.
 - Work your way back to the Automatic Mash Fill Valve.
- CLOSE the Black Wheel Valve between tubs 3 and 4.
 - This will stop the recirculation flow to the Sac Tank.
- OPEN the Air Valve to the selected Tub.
 - Located on the Air Header on the upriver side of the tub against the wall.
- CLOSE the Drop Valve to the tub by pulling the knob on the Honeywell board (up river side of the tub.)
- OPEN the (2) Manual Fertilizer (½ inch) Valves from the Mash Fill Header (located on the upriver wall by tub 8.)

4.2.2 RETURN to Control Room and OPEN Totalvision graphics page 1100.

4.2.3 ADD 90 Gallons of Fertilizer

Yeast Tub Process Management

Date Issued XX/XX	Document # 401.10.MILL.011	Version X.X	Page 5 of 6
----------------------	-------------------------------	----------------	----------------

- CLOSE the Automatic Sewer Valve (ASWRVLV) on the A-side drop line.
- OPEN the Tub Fertilizer Valve (TUBFERTVL).
- SELECT (YSTTB) on the Fertilizer Select button.
 - This will automatically open the TUBFERTVL and turn on Slurry Pump A.
- OBSERVE that the totalizer counts up to 90 gallons.
- DESELECT (YSTTB) on the Fertilizer Select button.
 - This will shut off the pump and close the automatic valve.
 - ENSURE that Sequence returns to MANUAL.

4.2.4 ADD Mash

- RESET the MASHTOT (Mash Totalizer) by hitting AUTO/AUTO on the D3 keyboard.
 - ENSURE that Totalizer is in AUTO.
- ENSURE that Mash Batch Set Point (MASHTOTSP) is at ZERO.
- SELECT AUTO on (MASHTOTSP)
- OPEN the Mash Fill Valve (MASHFILL).
- Start Mash Pump A (MASH-A).
- OBSERVE totalizer counting to 8320 gallons (mash set point).

4.2.5 When the temperature of the tub reaches 94F or lower you can add slurry yeast.

4.2.6 ADD Slurry Yeast.

- (In the field) MANUALLY OPEN Slurry Yeast Valves to isolate the Tub being set with mash.
- OPEN the 2 inch Chain Valve (between tubs 2 and 4) to isolate the Tub being set.
- ENSURE the Slurry Yeast Manual Fill Valve is OPEN to the tub being set.
- (In Control Room) OPEN Totalvision graphics page 1106.
 - CLICK on the TUBSEQ button.
- SELECT <SLURRY> from the drop down menu to start the automatic drop sequence.
 - VERIFY that the Pump STARTS. (automatic)
 - VERIFY that valves OPEN and direct the slurry yeast flow through the Slurry Totalizer (SLRYYSTTOT).
 - OBSERVE that the Slurry Totalizer counts to 150 and STOPS.
 - VERIFY that ALL Automatic Valves CLOSE.
 - VERIFY that Pump turns OFF.

4.2.7 When the mash totalizer (MASHTOT) reaches 8320 gallons:

Yeast Tub Process Management

Date Issued XX/XX	Document # 401.10.MILL.011	Version X.X	Page 6 of 6
----------------------	-------------------------------	----------------	----------------

- VERIFY that Mash Fill Valve (MASHFILL) CLOSES.
 - VERIFY that Mash Rinse Valve (MASHRINSE) OPENS.
 - This will send 200 gallons of flush water through the line.
- 4.2.8 ENTER Tub Number and Time Set on the TUB SET Worksheet.
- 4.2.9 MONITOR cooling water in the tub and maintain correct temperature for 8 hours.