1. Fill out Condenser Check Worksheet as much as possible for one condenser.
    a. Use a test gauge for head pressure if possible.
    b. Use an infrared temp gun or contact temp probe for non-condensable test.
    c. Do you have a temp and RH sensor? If not, check nearby weather station online.
2. Fill in section 1 for the remaining condensers to help you fill out the Tool.
3. Fill in the Condensers sheet In the Tool.
    a. Enter basic info for all condensers
    b. Estimate annual average operation

Email the detailed Condenser Check to: steve.koski@cascadeenergy.com and guow@ornl.gov

***Bonus - Email any interesting pictures to discuss!**

Condenser Check

Date:	**Site:**
Completed By:	**Engine Room:**

1) Basic Condenser Information:

Condenser Name:					**Total Fan hp:**	
Manufacturer:					**Total Pump hp:**	
Model:					**Pump Location:**	Integral Remote
Serial:					**Pump Throttled:**	No Yes
Condenser Type:	Forced Draft	Induced Draft	Standard	Hybrid	Water Saving	
Fan Type:	Centrifugal Fan	Axial Fan				
Fan Controls:	VFD	Cycling	Two Speed			

2) Pressure Calibration:

	Control System	**Test Gauge**
Condensing Pressure:	psig	psig

3) Temp and RH Calibration:

	Control System	**Test Probe**
Dry Bulb Temp:	°F	°F
Relative Humidity:	%	%
Wet Bulb:	°F	°F

4) Wet Bulb Approach Calculation Check:

Condensing Pressure Control:	Fixed	Wet Bulb	**Fixed Setpoint:**	psig

Wet Bulb Temperature:	°F	Displayed in control system, calculated from Dry Bulb and Relative Humidity
Approach Setpoint:	°F	Displayed in control system, typically 5-25°F
Floating Temperature Setpoint:	°F	Wet Bulb Temp + Approach
Floating Pressure Setpoint:	psig	Convert temp to pressure with NH3 table
Minimum Float Pressure:	psig	Displayed in control system
Maximum Float Pressure:	psig	Displayed in control system
Final Condensing Setpoint:	psig	Displayed in control system

5) Condenser Approach Check:

Test condenser approach in warm or hot weather when head pressure is floating above setpoint and all condensers are at maximum capacity.

Condensing Pressure:	psig	From control system or test gauge
Condensing Temperature:	°F	Convert pressure to temp with NH3 table
Wet Bulb Temperature:	°F	From control system or test probe
Condensing Approach to Wet Bulb:	°F	Condensing Temp - Wet Bulb Temp

6) Tube Bundle and Spray Check

Shut down the fan on one condenser. Remove some or all drift eliminators. With the pump on, check the following:

% of Nozzles Clear:	%	**Notes on Tube Bundle (Sprays, Rust, Scale, Biofilm, etc.)**
% Spray Coverage:	%	
Scale Presence, Thickness:		
Rust Present:	Yes No	
Biofilm Present:	Yes No	
Take picture of tube bundle:	Yes No	

7) Non-Condensable Check

Measure liquid drain line temperature at bottom of pipe after flows combine.

Liquid Drain Line Temp:	°F	Measured
Saturated Condensing Pressure:	psig	Convert liquid temp to pressure with NH3 table
Measured Condensing Pressure:	psig	From control system or test gauge
Non-Condensable Pressure:	psi	Difference of above pressures

A pressure difference of 10 psi or more is cause for action. Check auto purger, check purge point solenoids, manual purge, etc.