



Better Plants
U.S. DEPARTMENT OF ENERGY

**REFRIGERATION SYSTEM
VIRTUAL IN-PLANT TRAINING**

SESSION 8 – NOV 19, 2020



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Today's Agenda – Report Outs!

1. Campbell's Soup
2. Tyson Fresh Meats – Ottawa, IL
3. Tyson Logansport
4. Tyson Van Buren
5. Tyson North Little Rock
6. Tyson Robards
7. Tyson Waldron Complex

• Next Steps!

Feel free to ask questions in the chat!



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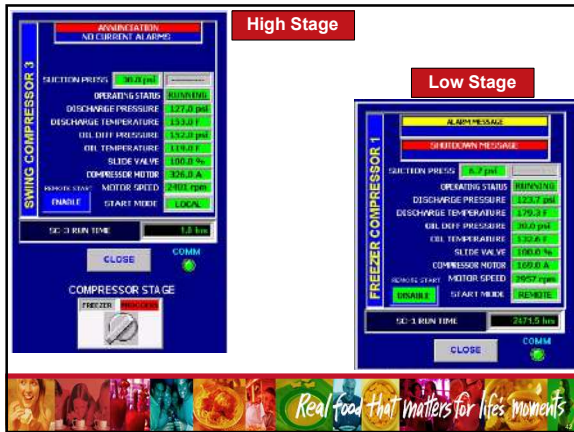


**Real Food
That Matters
for life's moments**

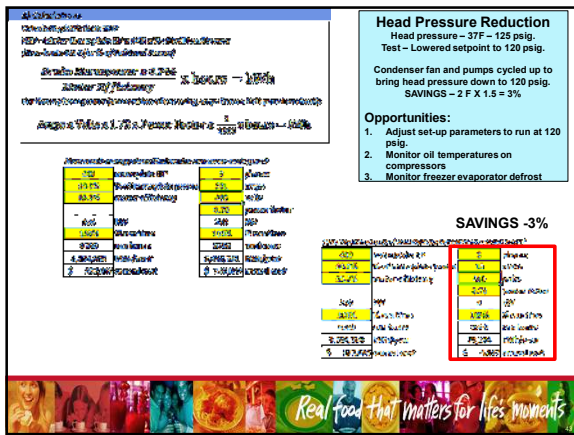
**Campbell Soup Supply Company
Ammonia Refrigeration System**



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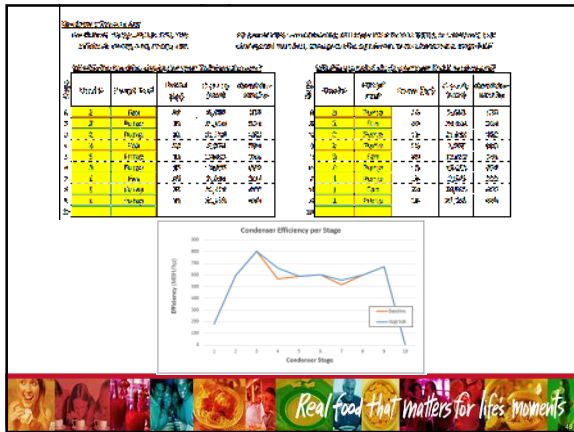
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STEP	DESCRIPTION	DURATION
1	CLOSE LIQUID VALVE AND BURNER GAS	30 SECONDS LEFT
2	TURN FAN OFF AND DISF Suction VALVE	40 SECONDS LEFT
3	OPEN HOT GAS AND BURNER COIL	10 MINUTES LEFT
4	CLOSE HOT GAS AND BLEED PRESSURE	300 SECONDS LEFT
5	OPEN Suction AND LIQUID VALVES	100 SECONDS LEFT
6	FANS FAN ON AND RESUME NORMAL OPERATION	

Hot gas pressure for defrost:
Head pressure – no BPR valve installed on system

Opportunities:

1. Install BPR valve & set to 70 psig
2. Increase pump down timer to 20 min.
3. Optimize 'step 4 & 5'.

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Tyson Fresh Meats – Ottawa, IL



JAMES WEISS
PSM COORDINATOR



TYSON FRESH MEATS





OTTAWA, IL




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Lower Discharge Pressure



- **Starting Head Pressure – 150PSIG**
- **Lowering discharge pressure saves 1.5% per degree.**
- **Current Head Pressure – 135PSIG**
- **Proposed Head Pressure – 120PSIG**
- **This change will save 14% energy**

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Raise Suction Pressure

- **Starting Suction Pressure – 30PSIG**
- **Raising suction pressure saves 2% per degree.**
- **Current Suction Pressure – 31PSIG**
- **Proposed Suction Pressure – 32PSIG**
- **This change will save 4% energy**





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Adjust Defrost Times


- Defrosting times are 60 minutes in storage
- Proposed Defrost time – 30minutes
- This change will save ??% energy

- Defrost in freezer 4x's a day
- Proposed defrost 2x's a day
- This change will save ??% energy

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Logansport Plant




Opportunity

- Reduce discharge psi from 130 psi to 125 psi.
 - Compressor separator design is a limiting factor to lowering our discharge pressure further.

With just a 5 psi reduction in discharge pressure, we are estimating that this will reduce our overall electricity consumption by \$36k annually.

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Logansport Plant



Opportunity

- Increase suction temperature from -19 to -15 °F in (4) compressors.

Increasing our suction pressure is estimated to give us a \$61k reduction in our overall electricity consumption annually.

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Logansport Plant



Other Opportunities Not Quantified

- We have energy saving opportunities on the 10° and 5° systems during the cooler months (Oct-May).
- Condenser water lines throttled back on EC5 and EC6. Need to put VFDs on these pumps.
- Put VFDs on the condenser fans and run them at where the condenser will be most efficient.
- Have condensers cycle pump, fan, pump, fan. run high efficiency condensers before running the less efficient units.
- Also check a higher pressure on the cut floor during winter.

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Van Buren Plant



Opportunity

- Reduce discharge psi from 145 psi to 135 psi in the colder months.

With just a 10 psi reduction in discharge pressure, we are estimating that this will reduce our overall electricity consumption by \$7k annually.

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Van Buren Plant



Opportunity

- Increase suction temperature from -51 to -47°F in (3) boosters.
- Increase suction temperature from 11 to 15 °F in (6) compressors.

Increasing our suction pressure is estimated to give us a \$18k reduction in our overall electricity consumption annually.

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NLR Plant



Opportunity

- Reduce discharge psi.

Season	Current		Proposed	
	Discharge Pressure	Discharge Pressure	Discharge Pressure	Discharge Pressure
Summer	170		150	
Fall	150		130	
Winter	135		130	
Spring	140		130	

We are estimating that this will reduce our overall electricity consumption by \$16k annually.

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NLR Plant



Opportunity

- We can and have been practicing raising the Low and High Stage Compressor Suction Setpoints on non-production days to allow the engine room to run more energy efficient.

Increasing our suction pressure just 20% of the time gives us an estimated \$12k reduction in our overall electricity consumption annually.

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NLR Plant



Opportunity

- We have identified approximately \$40k worth of annual savings in optimizing the sequencing of our equipment.

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Robards Plant



Opportunities

- -60° system was 18.6 INHG now 16.6 INHG
- -40° system was 8.6 INHG now 5.6 INHG
- Started monitoring all compressors and shutting them down when not needed and using 4160-volt machines when possible and shutting off 480-volt machines first.
- On weekends shutting down everything we possibly can.

Still working through calculating the energy savings.

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Robards Plant



Opportunities

- Change discharge psi from 150 psi to 130 psi, high stage compressors immediately showed a difference in slide valve position.
- Reducing hot gas times on evaporators and removing not needed cycles to reduce the amount of defrost cycles.
- Looking at not running evaporators during the winter in certain areas of the plant that don't need the extra cooling.

Still working through calculating the energy savings.

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Waste Elimination Project

“Energy Savings”

William Hamlet
Waldron Complex



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Specific Observation

- Energy usage excessive
- Substandard Operations
- Excessive Run times
- Compressors running partially loaded

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Type Of Waste

- ✓ Energy
- ✓ Running unneeded Compressors

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Current State

- Annual Energy consumption = 21,783,200 Kwh
- Annual Cost = \$ 1,742,656

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Equipment Run time's		
Process	Horse Power	Time
Operation (Production)	4000 X 75%	18 Hours
Transportation (Start-up & Shut-down)	5%	1 Hour
Inspection (PM's)	2%	.50 Hour
Waiting (Plant Clean-up)	18%	4.50 Hours
Storage (Waiting on parts)	0%	0
TOTAL	4000 X 100%	24 Hours

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Improved State
<ul style="list-style-type: none"> ▪ Annual Energy consumption = 19,169,216 Kwh ▪ Annual Cost = \$1,533,537.28 ▪ Annual cost savings = \$209,118.72, ▪ 12% cost reduction

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Improved Equipment Run time's		
Process	Horse Power	Time
Operation (Production)	3520 X 75%	18 Hours
Transportation (Start-up & Shut-down)	5%	1 Hour
Inspection (PM's)	2%	.50 Hour
Waiting (Plant Clean-up)	18%	4.50 Hours
Storage (Waiting on parts)	0%	0
TOTAL	3520 X 100%	24 Hours

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Waste Elimination

- ✓ Run Equipment based on needs.
- ✓ Monitor usage and energy billing for changes.
- ✓ Savings for energy and day to day operations.

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Savings

May 2019	1,470,206	421,500	1,891,706
May 2020	1,374,500	310,500	1,685,000
May	95,706	111,000	206,706
June 2019	1,626,456	528,000	2,154,456
June 2020	1,490,750	373,500	1,864,250
June	135,706	154,500	290,206
July 2019	1,582,706	393,750	1,976,456
July 2020	1,486,750	377,250	1,864,000
July	95,956	16,500	112,456
August 2019	1,708,206	412,500	2,120,706
August 2020	1,638,500	415,500	2,054,000
August	69,706	-3,000	66,706
September 2019	1,572,456	371,250	1,943,706
September 2020	1,378,500	285,750	1,664,250
September	193,956	85,500	279,456

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This Report was Completed with the help of the following...

Todd Brothers – PSM Coordinator
 Amanda Hill - Environmental Manager
 Our Refrigeration Operators for Making It Happen



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Thank you prizes for our presenters!

Copy of IRBPG

Choice of:

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Next Steps . . .

- Participation Certificates – email to follow
- Follow up on Project Implementation
 - TAM (or Wei) will follow-up with you to see how things are going
 - ~2-6 weeks initial check-in
 - ~6 months progress check-in
- Better Plants wants to recognize companies and celebrate your success!
- Upcoming Virtual Events???

Company	TAM Contact Information
Agropur	Travis Michalke (travis.michalke@icf.com)
Campbells Soup McWane / Synapse Wireless	Kiran Thirumaran (thirumarank@ornl.gov)
Tyson Foods	Wei Guo (guow@ornl.gov)

If your company is not listed, please feel free to reach out to Wei Guo (guow@ornl.gov)
 For Better Plants Information, please reach out to your TAM or Thomas Wenning (wenningtj@ornl.gov)

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Better Plants Resources

NO-COST SOFTWARE & TOOLS

Access no-cost software and tools to identify and implement energy saving opportunities and manage energy use.

60+ Calculators

20+ No-Cost Tools for Loan

Financing Navigator

No-Cost Resources & Guides

45 No-Cost Webinars & Growing

TRAINING & EDUCATION

120 In-Plant Trainings Conducted to Date

RECOGNITION

49 Better Projects & Better Practice Winners

59 Goal Achievers

350+ Solutions on Solution Center

17 National Labs Activate the Country

17 Lab Technology Days

Field Validation

National Recognition in Media and Online

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Survey

- How is DOE INPLT going for you so far?
- Kim will post a link to the survey in the chat window.
- Please hit the survey, then we'll wrap things up!

<https://bit.ly/ammoniaSURVEY>

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Next Steps

- Start saving energy! Complete the projects on your opportunity lists.
- Feel free to reach out to us with questions as you start implementation!

Stick around after this to ask questions for Steve and Tom!

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Thank you for joining!

Feel free to stick around and ask questions!

- Unmute yourself and ask away
- Send a chat
- Email: steve.koski@cascadeenergy.com
tom.simenc@cascadeenergy.com

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Slide 75

MK13 [@Kim Reed] is this the right suvery link?

Michael Koch, 11/18/2020

KR3 [@Michael Koch] Just updated the link. I didn't see where I could customize without paying, but I didn't take a lot of time to research.

Kim Reed, 11/18/2020

MK14 [@Kim Reed] i updated the link. A heads up, the link you had directed them to the view for us. There is an option to share that gives a different view.

Michael Koch, 11/18/2020

KR4 [@Michael Koch] you are right! I remember that now. My bad for rushing.

Kim Reed, 11/18/2020