

# Process Cooling

Gary Burgardt and Dan Hastings  
Frigel North America, Inc.  
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# Ameren Illinois Energy Efficiency Programs: COVID-19



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- Resources on appropriate PPE
- Links to webinars with information on COVID-19
- Apply for Financial Assistance
- Explore Payment Options

**For more information on financial assistance, contact Ameren Illinois at [1.800.755.5000](tel:18007555000).**



# COOLING TOWERS & FLUID COOLERS

- Most common type is an open loop evaporative cooling tower
  - Provides 85-90°F water temperature
  - Very efficient way to cool water but consumes a large amount of water
  - Open Loop Design allows for better cooling approach temperatures but also allows contaminants in the air to enter the system
  - VFD fans can help save energy in some cases



# COOLING TOWERS & FLUID COOLERS

- Fluid Coolers use a copper-aluminum fin pack to transfer heat
  - Provides 90-95°F water temperature
  - Very efficient when combined with VFD or EC fan motors
  - Can be combined with a spray system for operation in warmer weather



# SAVING ENERGY ON PUMPS

- Understand what pressure your process requires
- The pressure differential associated with heat exchanger is generally below 20-PSI
- Adding a Variable Frequency Drives (VFD) to your process pumps
- Locate the controlling pressure transducer closer to your process



# WASTED WATER FLOW FROM BYPASSES

- Many systems use more pumping power than required because of bypasses in their system. These include:
  - Large bypasses between the supply and return piping at the end a piping branch
  - Heat exchangers with no temperature regulating valve
  - Processes with no flow control
  - A Temperature Control Unit “TCU” can help close the loop



# CHILLED WATER SYSTEMS

Chilled water systems can be divided up into Air Cooled and Water Cooled and operate with the following compressor types:



Reciprocating (Piston)



Screw



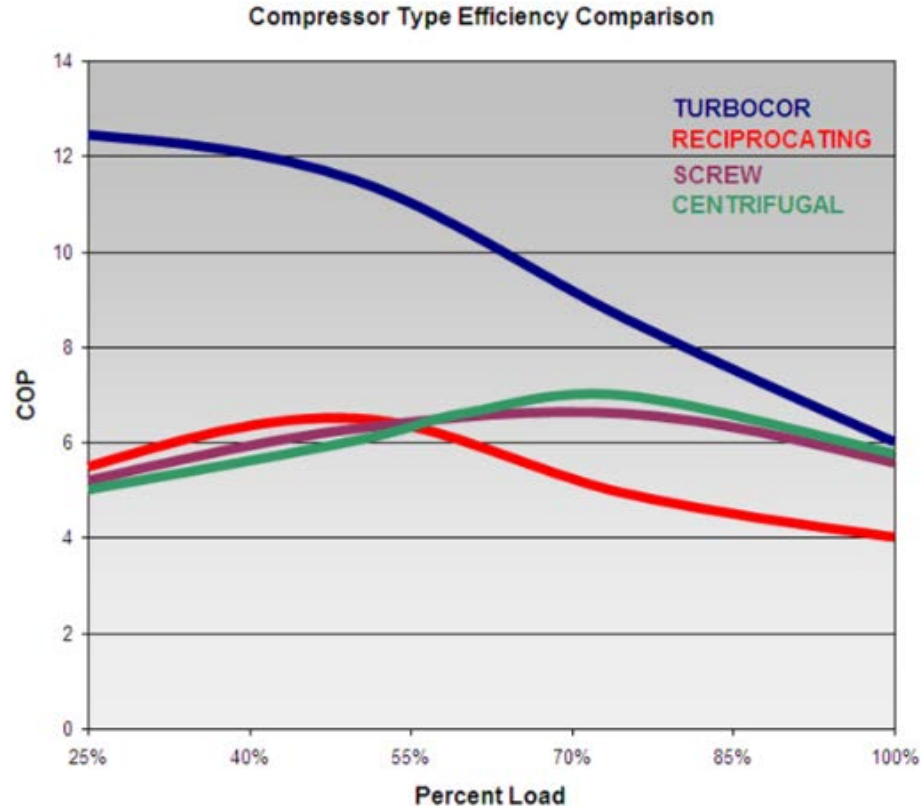
Centrifugal



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# COMPRESSOR EFFICIENCY





# ENERGY SAVINGS IN CHILLED WATER SYSTEMS



- Adding VFD drives on process pumps
- Keeping a regular maintenance schedule to keep condensers and evaporators operating at their best approach temperatures (compressor works harder)
- Upgrading from older chillers reciprocating compressors
- Understanding the process temperature requirement
  - Would a point of use chiller on the coldest process make sense?
  - Can we offload a process needing warmer water to a Cooling Tower or Fluid Cooler?

# FREE COOLING

- Free Cooling allows the chiller to be off-loaded by using a dry cooler in cooler weather conditions
- Can be achieved when outdoor ambient conditions are 10°F below setpoint conditions
- In the St. Louis area, with a chiller setpoint of 50°F, there is a potential to provide free cooling 25% of the year



# FRIGEL NORTH AMERICA

- Frigel North America, Inc is located in East Dundee, IL (NW Chicago Suburbs)
- Founded in Florence, Italy in 1960
- Established in the U.S. in 2006
- Provides cooling equipment and engineering solutions for:
  - Adiabatic Fluid Cooler Systems
  - Portable Air Cooled and Water Cooled Chillers
  - Central Chilled Water Systems
  - Pumps and Tanks



# AMEREN ILLINOIS ENERGY EFFICIENCY PROGRAM



- **Program Cash Available for Your Facility!**
  - Customer funded, paid upon project completion
  - Pre-Approval if >\$10,000 or Custom/Study application
- **Incentives/Applications for Compressed Air Systems**
  - Standard**
    - ✓ \$125 per hp
  - Custom**
    - ✓ Non-standard projects w/annual energy savings, 6 mo. – 10 year simple payback, max. 80% project cost
    - ✓ \$0.12/kwh saved, no max., 1-2 weeks pre/post metering typical



# AMEREN ILLINOIS ENERGY EFFICIENCY PROGRAM



## ❑ Feasibility Study

- ✓ Up to 75% third party costs (\$20,000 max.) for technical analysis/modeling, performance component

## ❑ Retro-Commissioning Study – Process Cooling/Refrigeration

- ✓ Up to 80% third party technical study cost, \$0.02/kwh saved annually on low/no cost efficiency measures (lower condensing pressure, raise suction pressure, modify evap, fan controls/defrost settings, compressor sequencing, etc.), identify/develop capital improvement projects for further incentives in other app's

## ❑ Metering & Monitoring Study

- ✓ Up to \$30,000 for equipment/install costs, performance component, example: cooling system flow meters



# PROGRAM RESOURCES

## Local Energy Advisors

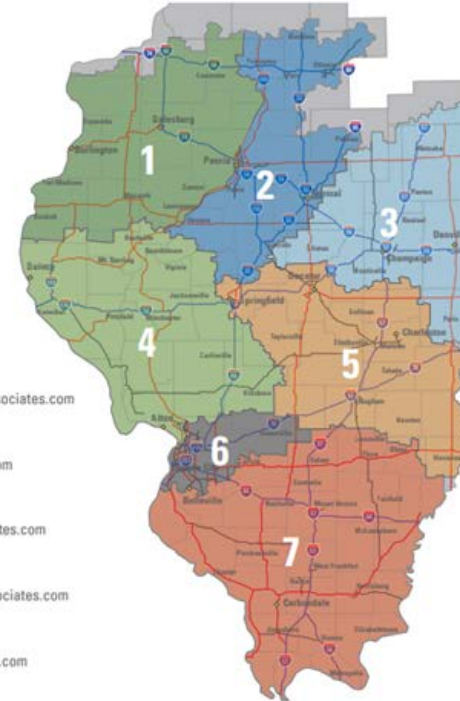
- Free site walk-throughs/consultations
- Consult on projects/application process

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## Program Industrial Energy Manager

- Joe Birschbach
- [Joseph.birschbach@leidos.com](mailto:Joseph.birschbach@leidos.com)
- 1.636.215.5096

## ENERGY ADVISOR TERRITORY MAP



- 1 Chad Whitehead**  
Chad.Whitehead@gdsassociates.com  
309.620.6333
- 2 Steven Smith**  
Steven.L.Smith@leidos.com  
309.212.5831
- 3 Rod Rhoads**  
Rod.Rhoads@gdsassociates.com  
217.649.8897
- 4 Mark Steinmetz**  
Mark.Steinmetz@gdsassociates.com  
217.670.9606
- 5 Michael Harrison**  
Michael.Harrison@leidos.com  
309.212.1490
- 6 Mike Thompson**  
Michael.E.Thompson@leidos.com  
309.213.0336
- 7 Larry Erwin**  
Lawrence.F.Erwin@leidos.com  
309.838.2340

**QUESTIONS?**





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