

# Lift Operations

## Lift Operations



- ⊗ Top Drive Lifts
- ⊗ Harmonics Filtering
- ⊗ Rate Structure and Peak Shaving
- ⊗ Energy Efficient Motor Selection
- ⊗ Heating and Lighting in Lift Houses
- ⊗ Sheave Liner Recycling
- ⊗ High Altitude Brushes
- ⊗ Paint Selection for Towers & Terminals

## Top Drive vs. Bottom Drive Lifts

- ⊗ Top drive 10 to 20% less expensive
- ⊗ Top drive 10 to 15% more capacity with same equipment
- ⊗ Issues
  - Power and access at top
  - May need road to top



## Case Study: A-Basin Top Drive vs. Bottom Drive Lift

- ⊗ Theoretical Savings
  - Capital cost savings = \$120K to \$240K
  - Annual energy savings = \$1,787 to \$2,681
  - Annual eCO<sub>2</sub> reduction = 25 to 37 tons
- ⊗ Upon Closer Inspection
  - Supplied Horsepower: 250 hp vs 300 hp
  - Concrete: 130 vs 140 cy
  - Contract Price: \$1,175,610 (top) vs \$1,177,400



## Heating and Lighting in Lift Houses

- ⊗ Relatively small electric load compared to the lift itself
- ⊗ But, more opportunities for low-cost energy savings
  - Reduced electric demand (kW)
  - Reduced electric usage (kWh)
- ⊗ And, the savings add up if applied to multiple lift houses
  - Routine upgrades of existing lift systems
  - New installations

## Case Study: Snowmass Mountain Timers on Heaters

- ⊗ Reduced heater use from 24 hours/day to:
  - 9 hrs/day for operator houses
  - 5 hrs/day for motor rooms and terminals
- ⊗ Capital cost: 55 timers x \$43/timer = \$2,365
- ⊗ Annual energy savings = 736,000 kWh
- ⊗ Annual cost savings = \$23,511
- ⊗ Annual eCO<sub>2</sub> savings = 568 tons (for both case studies)



Grasslin timer installed on Snowmass Mountain heaters.



## Case Study: Snowmass Mountain Reducing Number of Heaters

### ⚙️ No Longer Using 14 Heaters in Return Terminal Houses:

- ♦ Before: Four 10 kW heaters/terminal
- ♦ After: Two 10 kW heaters/terminal

⚙️ Capital cost: \$0

⚙️ Annual energy savings = 112,000 kWh

⚙️ Annual cost savings = \$4,395



## Harmonic Filtering

### ⚙️ Harmonics Filtering

- Harmonic distortion from large DC drives and AC motors
- Numerous possible issues: component life, capacitor failures, control malfunction, drive instability



- ⚙️ You'll save money if you have a power factor charge in your electric rate structure
- ⚙️ Expensive to implement, but Utility may be willing to partner
- ⚙️ Aspen is saving \$41,581/year from filtering

## Other Lift Operations Strategies

### ⚙️ Rate Structure and Peak Shaving

- Consider back-up diesels to avoid coincident peak charges
- Watch out for air quality regulations
- Aspen could save up to \$153,906/yr

### ⚙️ Energy Efficient Motor Selection

- Choose a regenerative drive
- Choose a DC motor if you're including harmonics filtering

## Other Lift Operations Strategies

### ⚙️ Sheave Liner Recycling

- Contact your local rubber recycling company
- If not now, check again in a few years

### ⚙️ Paint Selection for Towers and Terminals

- Avoid paint if possible - Choose dark galvanized steel
- If you have to paint, follow guidelines in Buildings Chapter