

# **Declining Pressures in Compression**

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## **Issues & challenges faced by producers**

- ✓ **Decreased, low, unstable, and unpredictable production**
- ✓ **Man-power intensive production**
- ✓ **Increased HSE risks**

# Declining Pressures in Compression

## Compressor specific challenges

- ✓ Increased compression ratios
- ✓ High cylinder temperatures
- ✓ Potential rod overload
- ✓ Increased likelihood of part failures
- ✓ Overall decreased equipment performance & reliability

# **Declining Pressures in Compression**

**Is the compressor owned or leased?**

# Declining Pressures in Compression

## If owned:

- ✓ Re-cylinder or reconfigure the existing unit
- ✓ Add a second compressor to add a stage of compression or boost pressure with a rotary screw
- ✓ Lease a replacement unit and dispose of compression asset
- ✓ Refurbish and/ or Relocate compression asset to another lease or area
- ✓ Field abandonment if economic limits are met

# Declining Pressures in Compression

## If leased:

- ✓ Operator has option to swap it out with a new right sized/type rental compressor unit
- ✓ Producer will face demob, transport, hook-up expense and some minimal downtime / lost production to swap compressors

# Declining Pressures in Compression

## If leased (cont'd):

- ✓ Capital can be used for other purposes such as drilling programs
- ✓ Compression cost is a fixed item on the operating expense and can be budgeted with certainty
- ✓ Manpower needs can be focused on exploration & production

# **Declining Pressures in Compression**

**Quote from producer who  
both owns and leases  
compression equipment:**

**“With the current low pricing  
environment in the rental market,  
leasing is our preferred business  
strategy for most applications”**



# Declining Pressures in Compression

## Standpoint of packagers & rental fleet operators:

- ✓ Rubber compressor still not available
- ✓ Allowing for wider operating ranges is usually not cost effective when leasing
- ✓ Whereas for purchase the customer's pocketbook dictates the design and ultimate cost
- ✓ It's what we do for a living

# **Declining Pressures in Compression**

## **Dealing with Declining Pressures in Gathering Systems**

# Options to Reduce Pressures

- ✓ Re-cylinder existing compression
- ✓ Re-stage existing compression
- ✓ Install additional compression in parallel
- ✓ Install additional compression in series

# **Key Consideration in Adding Compression in Series**

- ✓ **Optimizing Compressor Configuration**
- ✓ **Choosing the Most Effective Compressor**
- ✓ **Optimizing Intermediate Pipeline Pressure**

# Optimizing Compressor Configuration

- ✓ **Compressing to transmission line pressure at the wellhead uses less total horsepower.**
- ✓ **Large centralized compressor packages cost less to purchase and maintain per horsepower.**
- ✓ **However, wellhead compression is seldom cost effective due the higher costs associated with purchasing and maintaining a larger number of smaller compressors.**

# Decentralized Compression

- ✓ Can combine the efficiency of wellhead compression with the cost effectiveness of centralized compression.
- ✓ Usually the first choice when designing low pressure gathering systems initially.
- ✓ Can result in significant saving on initial, maintenance and fuel costs due to efficiency!

# Choosing Most Effective Compressor

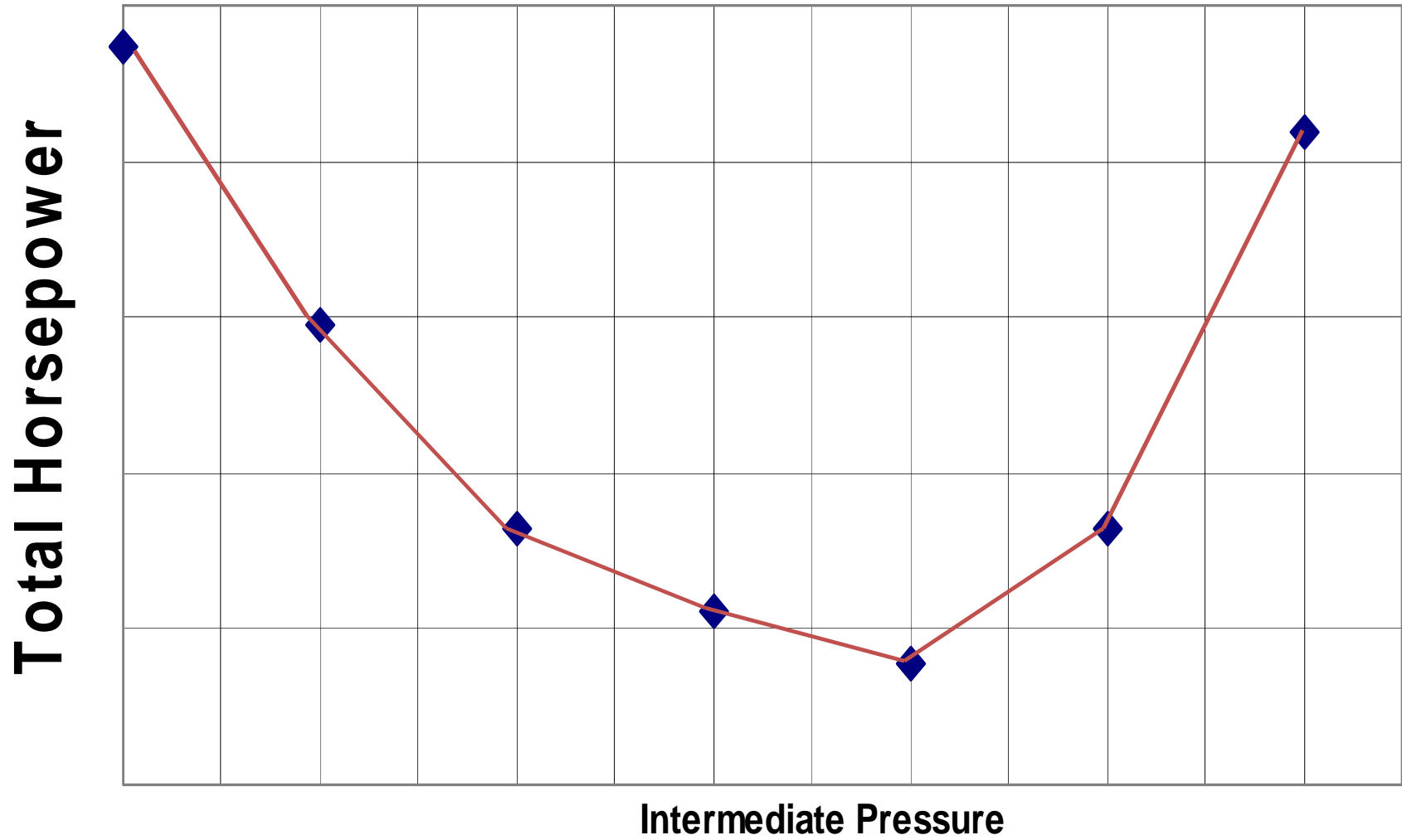
- ✓ Generally, reciprocating compressors tend to be more economical when suction pressures are above about 30 psig and compression ratio is less than 2.7 per stage.
- ✓ Rotary screws are usually more cost effective when suction pressure are less than 30 psig and compression ratios per stage are above 2.7.
- ✓ Other compressor types should be investigated if compression ratio and discharge pressure are low.

# **Declining Pressures in Compression**

**Optimizing Intermediate  
Pipeline Pressure Reduces  
Overall Horsepower**



# Optimizing Intermediate Pressure



# **Wellhead vs. Centralized Compression**

# Wellhead vs. Centralized Compression

- ✓ Impact on performance
- ✓ Impact on maintenance
- ✓ Emissions concerns
- ✓ Equipment preferences

# Wellhead vs. Centralized Compression

- ✓ Gas turbine driven vs. EMD
- ✓ Multi-body trains
- ✓ Restaging
- ✓ Power augmentation

# Declining Pressure in Compression

Questions?