Gas Well Unloading
Well Unloading ??

Well Flow:
- Depends on Delta P
- Flow Rate is a f of Delta P
- Rate Determines Velocity
- Velocity Determines Fluid Lift

Formations:
- Deplete over Time
- Build P While Well is Not Flowing
- Shut-in Time is Important to Fluid Unloading
“Smart” Automation

- Both Plunger Equipped and No Plunger
- On-site PLC Based
- Custom Control Code – Based on “Turner” Lift
- RTU Transmission to Host
- ~2300 Wells Under Control – Beginning in 2001
- Venting More than Halved – Production UP
Next Steps

“New” Code

- Optimize Performance
  - Improve Production
  - Reduce Venting

- Automate Further
  - “Better Learning”
  - Less Intervention

- 40 Well Pilot
  - 20 Control
  - 20 Test

- More to Come
Tight Gas Reservoir

- Most Wells Not Plunger Equipped
- Condensate and Water Production = Fluid Loading
- Venting to Atmosphere – Historical Approach
- Automated Shut-in Cycles – New Approach
- PLC; RTU; Host; and Automated Flow Valve
- 40 Well Pilot ~ 12 Months
- ~$5 K/Well for Automated Valve + RTU
Tight Gas Production

Tight Gas Type Curve

MSCF/Day vs. Days From Initial Prod.
Results to Date

- Venting Virtually Eliminated
- Production Up ~ 17 MCF/Well/Day
- Overall Better Well Control
- Reduced Operator Trips
- ~200 Well Expansion Planned for 06
- ~Production Enhancement of ~1167 MMSCF/Yr Expected
- Vent Reduction of ? Expected