Evolution of Gateroad Development in Pitt No.8 Seam

ACARP March 2008

What if you could improve your productivity by 20% in 10 weeks?

How about, 50% in 20 weeks?

What We'll Cover

What was done, how it was done,
why it worked, and how to repeat.

Pitt No.8 Background

Active Mines/Typical Tonnages & Rates

Typical Manning

Layout/Cut Sequence

Bolting requirements

Equipment

Active Mines,Tonnages, Rates

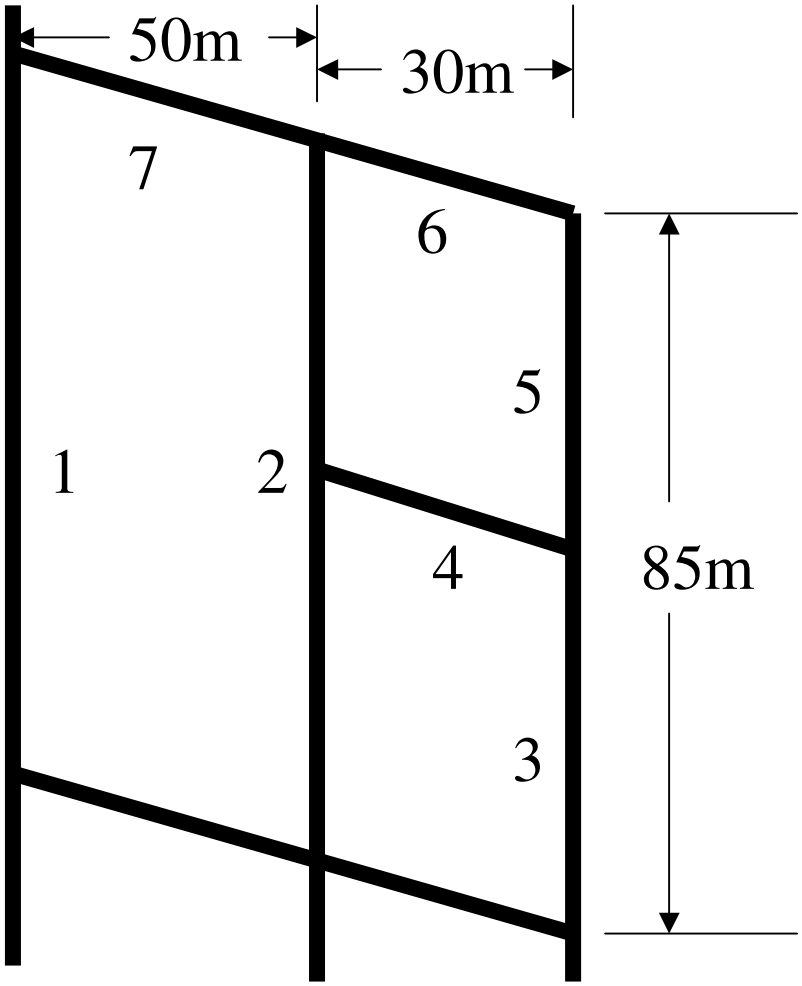
- Enlow – 9.7M tpa
- McElroy – 9.5M tpa
- Bailey – 9.3M tpa
- Cumberland – 6.8M tpa
- Century Mine – 5.9M tpa
- Loveridge – 5.6M tpa
- Emerald – 5.4M tpa
- Robinson Run – 5.2M tpa
- Blacksville – 4.5M tpa
- Federal #2 – 4.2M tpa
- Mine 84 – 3.2M tpa

- 3.4m/hr – 4.2m/hr inclusive of delays
- 1.8km – 1.9km linear advance per month
- 425m – 475m section advance per month

Typical Manning

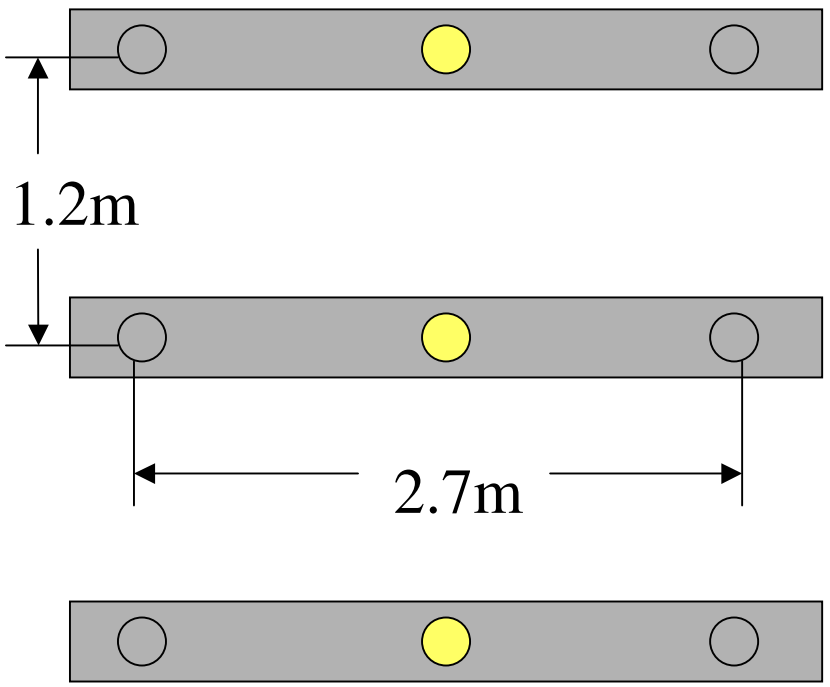
- Underground employment 400-500 per mine
- 7-10 face workers per gate section
- 2 Gate sections always running per active wall
- 1 – 2 Mains crews in production per active wall
- Multiple outbye crews managing belt, track, maintenance, and supplies

Typical Mine Layout



- 3 entry gates conforming to MSHA standards
- 7 cut sequence
- 4.7m wide headings
- 2.3m high entries
- Blocks 85m x 80m
- 200m – 300m depth

Typical Bolting Patterns



- 2 primary bolts (1.8m – 2.4m) plus “w” strap installed from miner
- Single rib bolts on either side of machine
- Secondary bolting completed within 72 hours of primary

Standard Face Equipment

- Simultaneous cut & bolt miner
  - 2 roof drills, 2 rib drills
- (2) Shuttle cars
- Loader
- Breaker feeder
- Single head mobile bolter
- Utility scoop

What Was Done…

What Was Done…

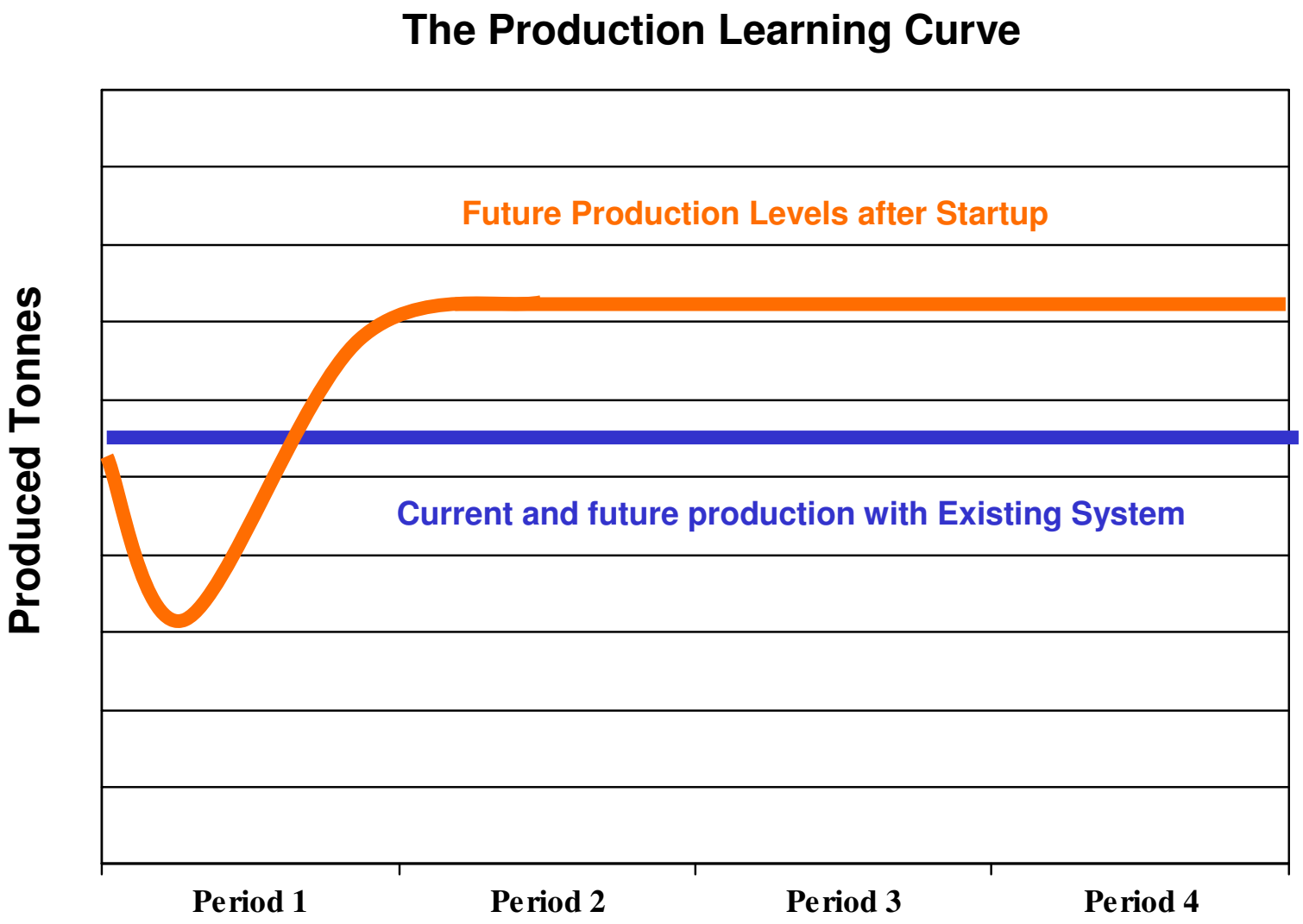
Surface Impression

- Removed
  - (2) shuttle cars
  - Loader
  - Breaker feeder
- Added
  - Continuous haulage system

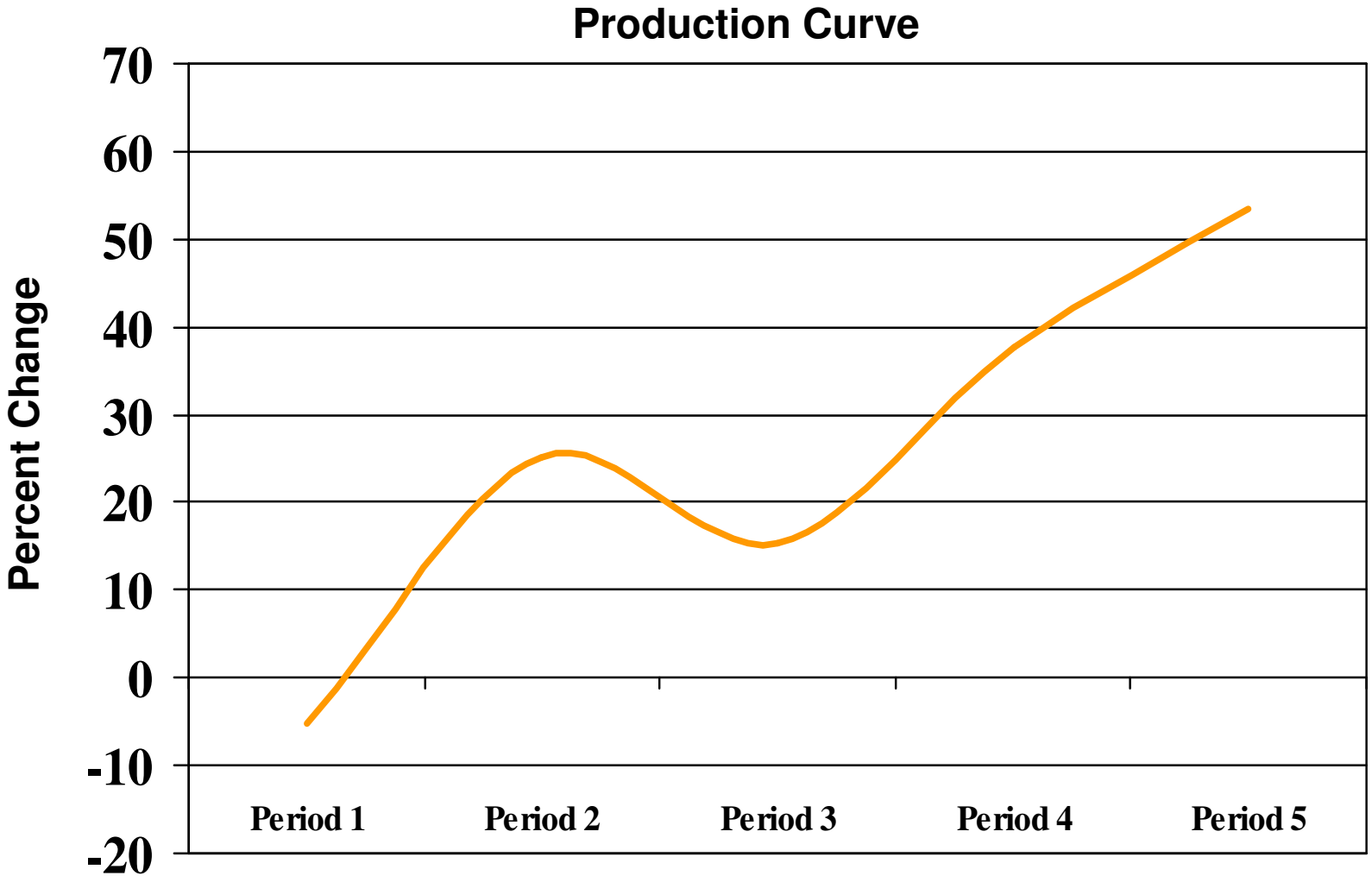
Reality

- Removed
  - Process waste
- Added
  - More cut time

What Was Done…



What Was Done…



How It Was Done…

- A champion was found
  - Saw the vision
  - Had organizational influence
  - Passionate about success
- A team was formed
  - Full time resources outside of local mine
  - Operational, technical, and business knowledge
  - Small in number, large on focus

How It Was Done…

- Evolution of the team
  - Educated on new technology, partnered with OEM
  - Mapped current process
  - Mapped “to-be” process with new technology
  - Refined “to-be” process
    - eliminated wasted steps, asked “Why?”, repeat
- Expansion of the team to mine level
  - Educated mine staff on product
  - Evaluated “to-be” process
    - Eliminated wasted steps, asked “Why?”, repeat

How It Was Done…

- Execution of the plan
  - All areas detailed
    - receipt at mine, assembly underground, flawless startup, production expectations
  - All parties knew their role
  - All teams prepared
- Begin again…

Why It Worked…

- A champion is key
- Small, focused cross functional teams
- Advanced, detailed planning
  - When to cut, when to bolt, when to supply, when to add belt, when to advance
  - Where to move, where to bolt, where to place fans, where to stage supplies
- Development sections run like a longwall…

What if I could improve your productivity by 20% in 10 weeks?

How about, 50% in 20 weeks?

How To Repeat …

- Find a champion for new processes
- Develop a solid cross functional team
- Evaluate “as-is”, define ideal process, eliminate everything else, audit
- Plan early, plan often

Planning and processes ensure success

Thank you.