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Summary

• **What is supply risk management?**
  - Supply chain risk: a hot topic
  - What is risk
  - Categories of risk
  - Supply Risk

• **Why is supply risk important?**
  - Lead time increases have been painful
  - Are we over the crest?
  - Raw material prices gone wild
  - Will prices come down?
  - Metals have been the hardest to predict
  - But labor is coming up next
  - Budgets are off; variance is increasing
  - Other gaps to manage
  - High stakes

• **How can you manage supply risk?**
  - How some companies approach risk
  - Potential risk management strategies
  - Quarterly market outlooks
  - Key metrics and alerts
  - Managed risk
What is supply risk?
Supply Chain Risk: A Hot Topic

Supply Chain Risk
(ISM Conference 2004)

Supply risk
(Supply Chain Planet)

Business continuity
(MIT)

Supply Network Design
(MIT)

Risk management
(Inside Supply Management)

Holistic Risk management
(Purchasing Magazine)

The breaking point
(Journal of Commerce)

Supply risk
(Supply Chain Management Review)

Supply Management Risk
(International Journal of Supply Management)

Risk control
(APICS Performance Advantage)

Balanced scorecard
(Harvard Business Review)

Supply continuity planning
(Inside Supply Management)
What is Risk?

• Risk: the possibility of an undesirable outcome
  • Will it happen?
    • x% likelihood that an event will occur
    • Probability distribution
  • How severe will it be?
  • What is the cost of mitigating it?
    • Optimal risk level: cost of risk = cost of mitigating it
Categories of Risk

Practical Categories of Risk

Material Availability
- Steel on allocation
- Specialty chemicals

Disaster Avoidance
- 9/11 recovery
- Tsunami

Regulatory Compliance
- 24-hour rule
- CSI

Cost Predictability
- Industrial chemicals up 15% last year
- Energy up 25% last 3 years

Disaster Recovery
- 9/11
- Viruses and hackers
Supply Risk

- Focus on major material availability and cost risks
  - Selecting or changing core suppliers
  - Selecting a plant site
  - Investing in safety stock
- These risks:
  - Relate to excellence in core procurement and supply chain competencies
  - Can be controlled with advance planning

Our Focus: Supply Risk

- Material Availability
- Cost Predictability
- Regulatory Compliance
- Disaster Avoidance
- Disaster Recovery
Why is supply risk important?
Leadtime increases have been painful
Are we over the crest?
Raw material prices gone wild

Selected Producer Price Indices (1994=100)

Source: Boston Logistics Group
Will prices come down?

Price Forecasts for Selected Chemical Inputs

Source: Global Insight
Metals have been the hardest to predict

Source: Global Insight
But labor is coming up next

Labor vs. Materials Costs

Chinese Labor Rates

Source: Boston Logistics analysis

Source: Chinese government sources.
Budgets are off; variance is increasing

- Expense: 50% are over-budget, 62% worsening
- Capital: 60% are over-budget, 73% worsening
Other gaps to manage

- Quality deficiencies
- Chinese toy recalls
- Lack of innovation
- GM
- Microsoft (Windows)

R&D % of Sales

- Medical/pharma
- IT/Electronics
- Vehicles
- Aerospace
- Chemicals
- Machinery & equipment
- Basic industries

Source: Standard & Poors Compustat, Englewood CO
High stakes

- Stock market devaluation
- Financial loss
- Lost productivity
- Lost speed to market
- Personal stress
- Career disruption
How can you manage supply risk?
## How some companies approach risk

### Organizations and Processes to Manage Supply Base Risk

<table>
<thead>
<tr>
<th>Company</th>
<th>$1B Specialty Minerals Processor</th>
<th>$2B Construction Company</th>
<th>$3B Defense Supplier</th>
<th>$6B Medical Device Manufacturer</th>
<th>$23B Controls Conglomerate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Organization</strong></td>
<td>Qtrly committees: Eng’g, SC, Mktg, Ops</td>
<td>Unavailable</td>
<td>Material Program Manager owns risk</td>
<td>Purchasing Council</td>
<td>Supplier Health and Quality group</td>
</tr>
<tr>
<td><strong>Goals</strong></td>
<td>Product availability and quality</td>
<td>Cost predictability</td>
<td>Timeliness and reliability of materials</td>
<td>Cost reduction</td>
<td>Supplier development</td>
</tr>
<tr>
<td><strong>Time Horizon</strong></td>
<td>10 years</td>
<td>5-6 years</td>
<td>4-7 years</td>
<td>1 year</td>
<td>1-2 years</td>
</tr>
<tr>
<td><strong>Process</strong></td>
<td>Long-term, anchor suppliers</td>
<td>Long-term agreements</td>
<td>Ops planning on top of ERP</td>
<td>Single-sourcing</td>
<td>System/ information-driven</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Buy capacity, not piece parts</td>
<td>Critical supplier and material assessment</td>
<td>Gate process</td>
<td>Spend/ budgeting focus</td>
</tr>
<tr>
<td><strong>Results</strong></td>
<td>Incurring price increases anyway</td>
<td>To be determined</td>
<td>High reliability</td>
<td>Incremental cost reductions</td>
<td>Large cost reductions</td>
</tr>
</tbody>
</table>
## Potential risk management strategies

<table>
<thead>
<tr>
<th>Avoid risk</th>
<th>Diversify risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Reduce consumption</td>
<td>1. Centralize purchasing</td>
</tr>
<tr>
<td>2. Pass costs on to customers</td>
<td>2. Join a buying consortium</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hedge risk</th>
<th>Minimize risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Buy options</td>
<td>1. Buy in advance at the current price</td>
</tr>
<tr>
<td>2. Study and anticipate market conditions</td>
<td>2. Sign long-term contracts at forecast rates</td>
</tr>
</tbody>
</table>
Avoidance is best; hedging is often practical

Percent Savings by Strategy

- Buying consortium
- Centralized Purchasing
- Value Engineering
- Options
- Stockpile
- Contracts
- Surcharges
- Price Increase
- Spot

6/30/2008
Quarterly market outlooks

Market Assessment and Forecast

MILL ROLLS 2006

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2.2 Capacity 6
2.3 Leadtimes 9
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2.5 Suppliers 15
2.6 Technology 20
3 Implications 22

Figure 1: Key Indicators

<table>
<thead>
<tr>
<th>Indicator</th>
<th>2006-2008</th>
<th>2008-2010</th>
<th>2010-2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order Leadtime</td>
<td>▲ 8.2%</td>
<td>▼ -17.0%</td>
<td>▼ -62.6%</td>
</tr>
<tr>
<td>Prices</td>
<td>▼ -4.8%</td>
<td>▲ 2.8%</td>
<td>▲ 2.3%</td>
</tr>
<tr>
<td>Capacity Utilization</td>
<td>▼ -4.2%</td>
<td>▼ -12.5%</td>
<td>▼ -13.1%</td>
</tr>
<tr>
<td>Supplier Concentration</td>
<td>Low 0.3%</td>
<td>Low -0.2%</td>
<td>Med -3.7%</td>
</tr>
</tbody>
</table>

1 Highlights

Demand: Mill roll demand will continue to grow through 2012, in step with robust capital investment in iron and steel production.

- Capital investments will grow at 10-12% per year from 2006-2012.
- Chinese demand will increase at an average of 10% per year over that period.
- Stainless steel and high-growth segments will fuel a demand for various specialized mills.

Supply: Suppliers are adding capacity, but the incremental capacity will not alleviate the current
### Key metrics and alerts

#### Key Metrics

<table>
<thead>
<tr>
<th>Key Metrics: Change Q1-Q2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Order Leadtime</td>
<td>▲ 3.3%</td>
</tr>
<tr>
<td>Prices</td>
<td>▲ 0.1%</td>
</tr>
<tr>
<td>Capacity Utilization</td>
<td>▼ 0.5%</td>
</tr>
<tr>
<td>Region Risk: Asia</td>
<td>▲ 2.8%</td>
</tr>
<tr>
<td>Supplier Concentration</td>
<td>LO 0.3%</td>
</tr>
</tbody>
</table>

#### Text Alerts

**Yellow (Any Period)**
- Prices change 1-5%
- HHI above 1500-1800
- Capacity margin <$150 million
- Capacity Utilization >85%
- Leadtime up 5-10%
- Important news

**Red (next 2 Quarters Only)**
- Prices change 5%+
- HHI 1800+
- Capacity margin <$100 million
- Capacity Utilization >90%
- Leadtime up 10%+
- Technological breakthrough

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**Prices Rising**

**Capacity Shortage**
Managed risk

- Mapped and benchmarked price curves

- Solid strategies for managing risk

![Graph showing price trends over time with market and adjusted prices]
Global Supply Chain Economists™

Boston Strategies International helps supply chain executives make critical supply chain decisions that involve investment and risk by forecasting the evolution of supply markets and technologies. Our mission is to help our clients develop globally competitive supply networks that maximize Supply Chain Value™. Our products and services include:

- **Industry Research** that helps investors and policy makers identify emerging issues that affect their supply chains, and quantify the impact that they will have
- **Cost and Pricing Analysis** that helps financial and operational managers plan and budget by providing benchmark, best practice, and forecast data tailored to their companies' supply chains
- **Strategy Consulting** that helps supply chain leaders make high-stakes decisions related to mergers & acquisitions, market entry, capital investments, outsourcing, off-shoring, and make-or-buy

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