



**Petroleum Stockpiling in the 21st Century**



# **Threats and Protection Strategies for Strategic Stockpiling Facilities**

**Benjamin M. Butchko**  
**Butchko Security Solutions**



# Outline



- Threats
- Above-Ground Storage
- Underground Storage
- Security Strategies
- Case Studies / Lessons Learned



# Threats



- Aggressors
  - Civil disorder
    - Outside perimeter
    - Inside perimeter
  - Criminal
  - Terrorist / Para-military
    - Organized
    - Well trained and equipped





# Attack Results



- Damage to facility
- Disruption of operation
- Loss of reserve usability
- Environmental damage
- Publicity





# Above-Ground Reserves

- Advantages
  - Large geographic footprint
  - Safety and containment systems
  - Repeated Fill-Empty-Refill
- Weaknesses / Vulnerabilities
  - Aerial and Stand-off attack
  - Reserve exposed
  - Environmental impact of successful attack





# Underground Reserves

- Advantages
  - Natural reserve protection
  - Operational recovery
  - Wellhead loss not significant impact
- Vulnerabilities
  - Removal of product accessibility





# Security Strategies



- Assess Security Risks

- Identify Critical Assets

- Operational
    - Spares
    - Manpower

- Threats

- Malicious
    - Natural

- Manage Security to Reduce Risk

- Don't just focus on Vulnerabilities

Probability of Occurrence

	A	B	C	D	E
1	1	1	2	2	3
2	1	2	2	3	4
3	2	2	3	4	4
4	2	3	4	4	5
5	3	4	4	5	5

Severity of Occurrence

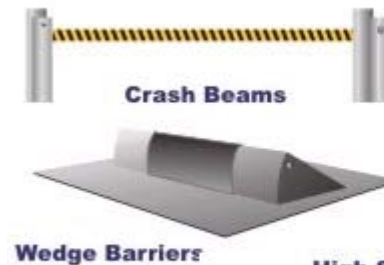
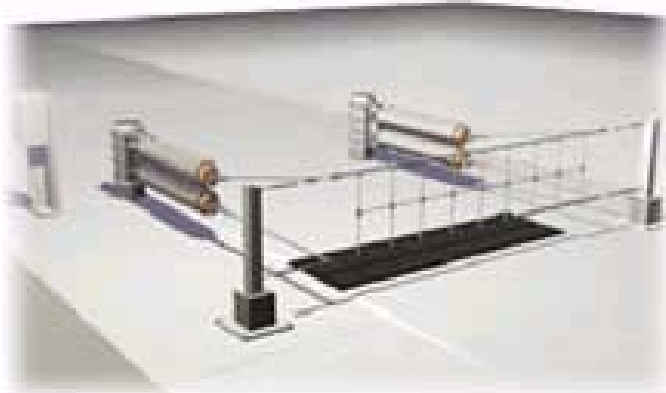


# Security Strategies

(continued)



- Site Perimeter
  - Natural and Man-made barriers
    - Direct vehicle and pedestrian access
    - Prevent unauthorized vehicle entry
  - Video assessment of site access points



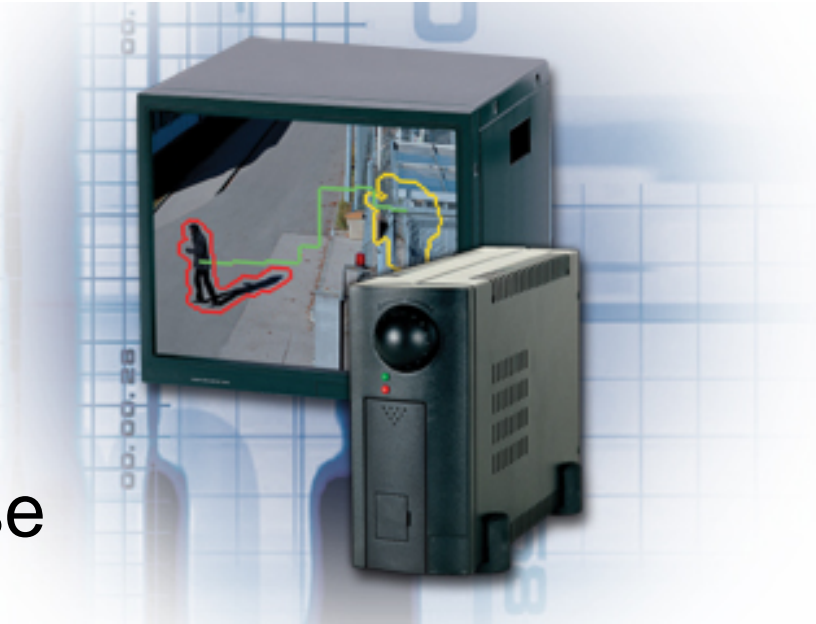


# Security Strategies

(continued)



- Integration of Technology and Personnel
  - Barrier Systems
  - Intrusion Detection
  - Assessment
    - Video
    - Audio
  - Monitoring and Response
    - Operations
    - Security





# Security Strategies

## (continued)



- Geographically dispersed reserves
- Security force deployment
  - Integration
  - Coordination
- Communications
- Safety and Containment systems
- Recovery and Backup operations systems
  - Barge-based pump systems
  - Barge/ship-borne transport
  - Repair and replacement



# Business Case Studies / Lessons Learned



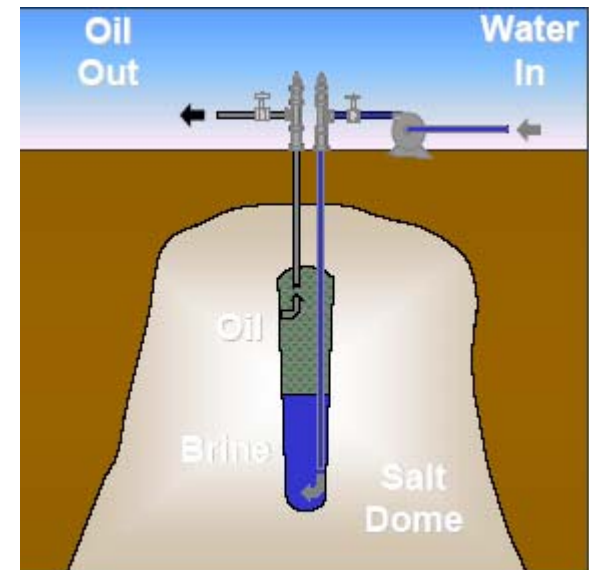
- Locations - West Africa, Indonesia, Colombia
- Above-ground storage utilized for operations continuity
- Stockpile quantity based upon response time to a disruption/attack
- Tanks managed to reduce explosive volatility
- Rapid repair and recovery processes
  - Stockpile spare parts and maintenance equipment
  - Stage in protected and accessible areas



# Strategic Case Studies / Lessons Learned



- Primary security sensors at natural chokepoints and critical assets
- Barge-based pumping and support
- Refined repair and recovery
- Stockpiled spare parts and maintenance equipment
  - Stage in protected and accessible areas
- Deploy protection resources to alternate facilities
  - Maintain backup facilities
  - Recover facility under attack



Oil Drawdown



# Questions



- Questions / Discussion
- Contact Information

Benjamin M. Butchko

President & CEO

Butchko Security Solutions

12335 Kingsride Lane #363

Houston, Texas 77024 USA

1-832-528-9662

[bmbutchko@butchkoinc.com](mailto:bmbutchko@butchkoinc.com)

[www.butchkoinc.com](http://www.butchkoinc.com)