

Explosives and Blasting Safety

Lawrence J. Mirabelli – Senior Technical Consultant



Improving Processes. Instilling Expertise.



Safety

- **Safety is extremely critical to the profitability of your individual sites and your entire company.**
- **The costs of an incident go well beyond the more obvious consequential losses of personnel, equipment and/or production.**
- **Incidents that involve private settlement either inside or outside your organization and/or a regulatory closure order have a direct affect on sales and profits.**
- **Your safety program is part of your “cost to produce” and is a cost that adds value directly to the bottom line of the balance sheet.**

Value of Safety

Cost of Incident	Amount of Additional Sales Revenue needed to negate the loss. (based on 10 % margin)
\$25,000.00	\$250,000.00
\$50,000.00	\$500,000.00
\$100,000.00	\$2,500,000.00
\$500,000.00	\$5,000,000.00

- **If you consider the cost consequence of reacting to an incident, the value delivered by the cost of a proactive safety program is obvious.**
 - ✓ **Consider the revenue necessary to negate the cost for the loss attributed to an incident.**
 - ✓ **Remember these revenues are above and beyond the budgeted revenues specified to meet annual budget targets.**

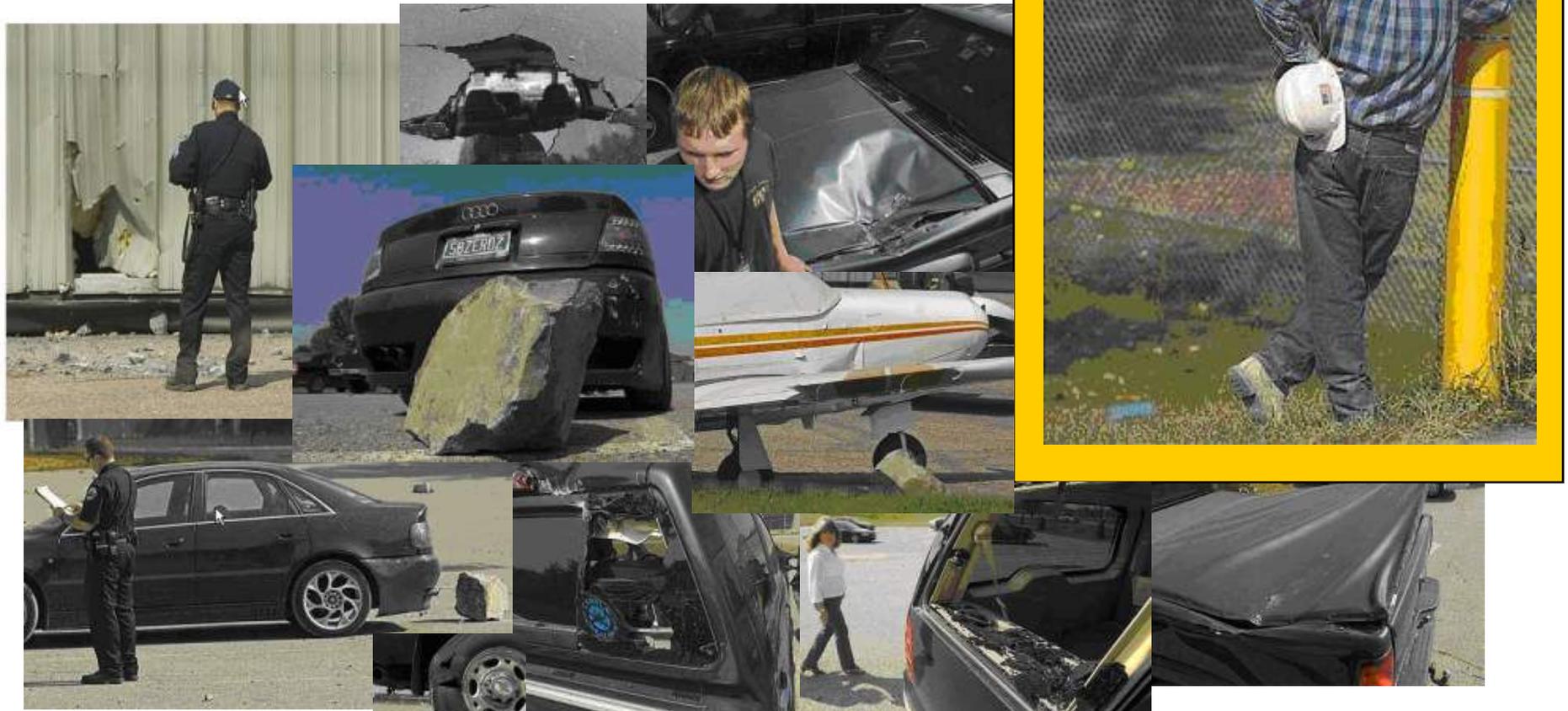
Objective of Today's Presentation

- **Review current events that will keep your “Safety Focus” sharp.**
- **Refresh awareness of other issues that cannot be ignored.**
- **Present Informational Resources for Explosives and Blasting Safety.**
- **Deliver a safety audit tool focused on the blasting process that can be used at your operation to identify areas of improvement for your safety programs.**

Current Events - Flyrock

Quarry blast rains rocks in S. Burlington Explosion propels stone onto buildings, cars, airplanes

By Matt Sutkoski, Free Press Staff Writer • September 25, 2008 SOUTH BURLINGTON, VT



Current Events - Lightning

Lightning triggers quarry blast

Boulders roll onto loaders. One woman killed. 15 People Injured.

Bettahalasur Rocks, Chikkajala

Times of India, India Times • July 24, 2008 Bangalore, India



Current Events - Misfires

Fatal Accident Newsflash

Death of a quarry blaster at Ewekoro Quarry

April 28, 2008 – Wapco Nigeria, Africa

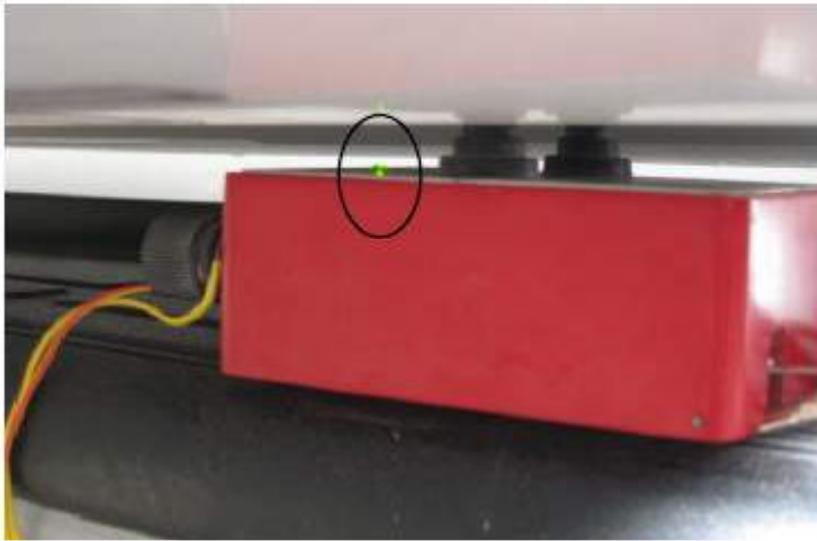


Current Events – Premature Detonation

Hazard Alert

Blasting Machine / Inadvertent Detonation

September 15, 2008



Current Events - Misfires

Explosives Turn Up in Shore Rocks. Maryland Discovery Disrupts Erosion Control Project Severna Park, Md

By William Wan, Washington Post Staff Writer • August 1, 2008



Don't Forget - Highwall Safety

- **Routine work involved with Drilling and Blasting bring personnel and equipment both near to elevated open crests and immediately below exposed faces and elevated bench tops.**



Don't Forget Highwall Safety

- Demarcation of danger zones should be **NON NEGOTIABLE** in all circumstances.
- Personnel must **ALWAYS** use proper personal fall arrest or fall restraint systems whenever working closer than 6 feet to the crest of any high-wall, or where there is any danger of falling due to unstable conditions, slopes, etc.



Don't Forget - Highwall Safety

- **ALWAYS** use specific demarcation and warning signage on all operating benches below which personnel are working.



Don't Forget Blast Site / Blast Area Security

- **ALWAYS** consider necessary adjustments to the Blast Area for each blast event.



Don't Forget Blast Site / Blast Area Security

- Mobile equipment not directly related to the drill and blast operation must be restricted from the Blast Site from start of loading through to blast initiation.
- **NEVER** permit blasting equipment (non electric, electric or electronic) on the blast site.
- **ALWAYS** evacuate the blast site and secure an appropriate blast area on approach and during a lightning storm.
- **ALWAYS** keep the blast area secure until the “all clear” has been sounded.
- **ALWAYS** keep an appropriate blast area secure until a misfire has been resolved.



Don't Forget Blast Site Security Radio Frequency & Electrical Hazards



- Recent technology developments and increasing popularity of personal portable communication devices, increase the probability of RF hazards and sources of electrical current entering the blast site.
 - ✓ Be aware that such devices can not only be carried-in by personnel but also carried-in as accessories to or built-in options to mine equipment and transient vehicles.
 - ✓ Whether electric or electronic initiation system RF hazards still must be respected.
 - Current MSHA language does not differentiate between electric and electronic detonators.
- **Regardless of the type of explosive materials or initiation system used, because cell phones distract personnel from their job task, it is best practice to keep them off the blast site!**





Homeland Security Preparedness

National Threat Advisory:

ELEVATED



SIGNIFICANT RISK OF TERRORIST ATTACK



- The IME recommends that all manufacturers, distributors and users consider implementation of enhanced security measures based on the varying levels of security threat declared by the Department of Homeland Security (DHS) using its Advisory System.
- Quarry operations should develop action plans with enhanced security measures to be enacted in the event of increased threats.
 - ✓ DHS Threat Level “Orange” or ‘High” and above.
- Recommendations for both general security and enhanced security when security risks have temporarily increased can be found in the IME Safety Library Publication No. 27 “Security in Manufacturing, Transportation, Storage and Use of Commercial Explosives.”
 - ✓ Appendix A of SLP-27 presents a template for development of a security plan.

Available Reference Resources Safety Information

- Internet websites to visit for safety information relative to explosives and blasting.

- ✓ www.msha.gov
- ✓ www.atf.treas.gov
- ✓ www.ime.org
- ✓ www.isee.org
- ✓ www.dynonobel.com

Today's Message

- **The real value of Safety can easily be lost in the balance sheet. The cost of prevention far outweighs the cost of an incident.**
- **Use current events to help keep your “Safety Focus” sharp.**
- **Use “Near Misses” to maintain awareness of issues that can easily be de-emphasized over time.**
- **There are many informational resources for Explosives and Blasting Safety.**
- **There is a Blasting Process Safety Audit Tool focused on the issues discussed in this presentation. Use it at your operations to identify opportunities for improvement in your safety programs.**

What to do next?

- **Consult the Blasting Process Safety Audit Tool in your package.**
- **Take it back to your operation and use it.**
 - ✓ **Complete it yourself.**
 - ✓ **Have personnel at various levels in your organization complete it individually. (Safety Manager, Pit Foreman, Labor Force Peers)**
- **Compare the results recorded by you and the other individual auditors.**
- **Any “NO” responses, identifies an area of opportunity to improve your safety program.**
 - ✓ **Take action to make it a “YES”.**

What questions do you have?



www.quarryacademy.com



Improving Processes. Instilling Expertise.

DYNO
Dyno Nobel



SANDVIK