A wide-angle photograph of a large-scale surface mining operation. The scene shows a deep, terraced pit with reddish-brown soil and dark grey rock. In the foreground, a large yellow haul truck is partially visible, carrying a load of dark material. The background features a long, straight road or conveyor system stretching across the landscape under a clear blue sky with scattered clouds. A white rectangular box with a black border is centered over the image, containing text.

Surface Mining Association for
Research and Technology
“SMART”

Safety Moment



Risk Management



Risk Management

Fire

Erosion

Corrosion

Deflagration

Falling

Flow

Radiation

Confinement

Flame Speed

Dust Suspension

Lifting

Reactivity

Crushing

Roll Over

Organism

Process Hazards

Flammability

Electrical Source

Back-Flow

Piling

Boil Over

Dispersion

Low Oxygen

Explosion

Pressure

Vibration

Low Temperature

Detonation

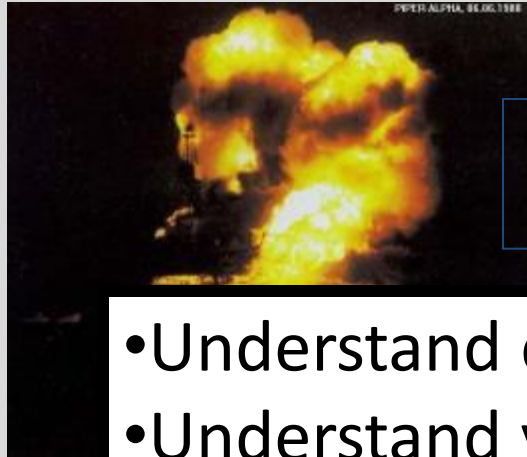
Flaring

Solutions

High Temperature

Toxicity

Engineer's Survival Guide



Top Event
Immediate Cause

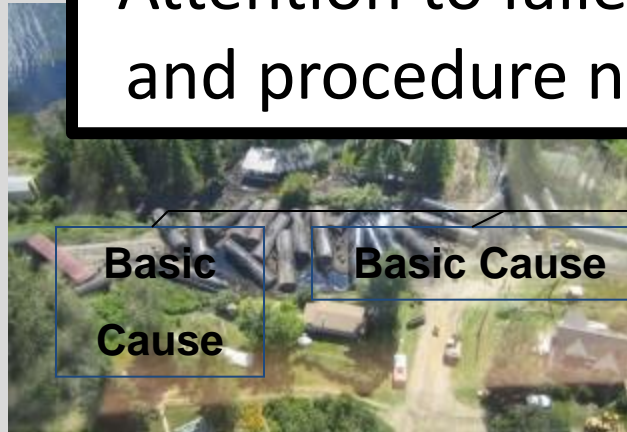


Management Activities
To track company actions against policy.

Risk Analysis Activities
To track look for and analyze hazards or concerns that arise that challenge policy.

Management Activities
To ensure company activities keep risks under control.

- Understand company values
- Understand your program and your responsibilities to it
- Competing objectives managed
- Attention to failed equipment/sensors/controls and procedure noncompliance



Basic Cause

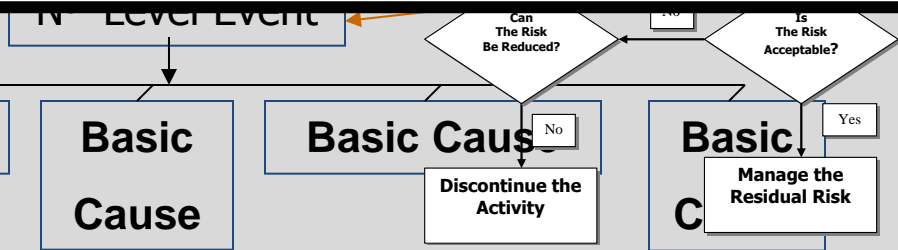
Basic Cause

N Level Event

Basic Cause

Basic Cause
Discontinue the Activity

Basic Cause
Manage the Residual Risk



Surface Mining Association for Research & Technology

SMART

**Celebrating
19 Years!**

**Working Collaboratively To Improve
Mining Industry Effectiveness**



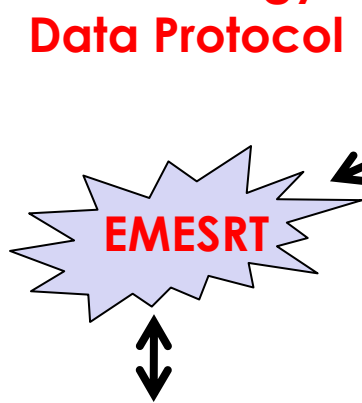
SMART Surface Mining Association
For Research & Technology

the SMART Group ...

- **The SMART Group is made up of Mining people who share a passion for making our Industry better. The SMART membership regularly contribute their personal time and effort to collaborate in Industry wide initiatives, learning forums and best practice sharing that is made possible by meeting and working as the SMART group on a continued basis.**
- **Mining Senior Leaders from across Canada, the United States of America and internationally have come to appreciate the work of SMART on a number of fronts. When we work together, we indeed have a track record of making a positive difference for our Companies that helps our Mining Industry as a whole.**
- **It's a Group where Operators work together and are supported by key personnel/organizations to progress surface mining effectiveness.**

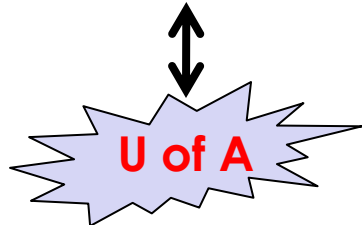
SMART Focus Areas ...

Information
Technology
Data Protocol



Equipment
Safety Design
Improvements

University
Learning
Seminars



Mechatronics,
APCOM Support



SMART is an association of mining companies that meet regularly to coordinate the technology development needed by the mining industry. Since 1995, the member companies and institutions have directed research and influenced the manufacturers and suppliers to improve surface mining technology and services. SMART actively supports learning seminars, collaborative research projects, and user groups.

Members of SMART include many of the surface mining companies in North America and Australia. These companies have recognized the value that collaboration can bring to the needs of individual organizations as well as the global mining industry.

- Historical - Mining GPS User Group
- Mine Haul Road Design and Construction
- Diesel Emissions Evaluation
- Haul Truck Development

Safety
Information
Sharing

Truck Shovel
User Group

Large Tire User
Group

Benchmarking
Project

Targeted
Information
Sharing