

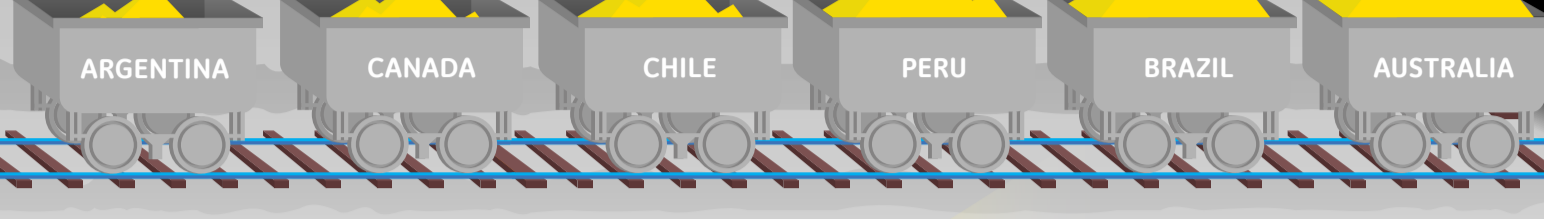
# ELECTRICAL SAFETY IN MINING

Brought to you by GE's Industrial Solutions business

Mining provides resources necessary for everyday commodities and future technologies. As mining grows, companies must protect employees from electrical hazards like arc flashes.

## MINING IS GROWING

Countries that are projected to make the largest investment in the mining industry between 2013 and 2030: <sup>1</sup>



From 2006-2011 Australia's mining industry employment rose over <sup>2</sup>

**+75.5%**



Experts predict the Canadian mining sector will create more than

**6,000**

jobs over the next 5 years.<sup>3</sup>



U.S. mining supports nearly **2 Million Jobs** and generates revenues of more than<sup>4</sup>

**\$100 Billion/Year**

MINCOM REPORTS WORKPLACE SAFETY IS A MAJOR CONCERN OF MORE THAN

**71% OF MINING EXECUTIVES<sup>5</sup>**

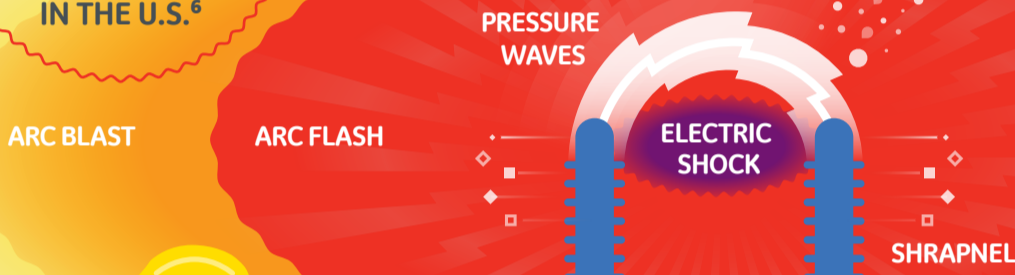
Rapid industry growth puts extra importance on protecting employees and equipment from electric hazards like arc flashes.

### WHAT IS AN ARC FLASH?

AN ARC FLASH IS A RELEASE OF HEAT ENERGY. THEY ARE OFTEN VIOLENT RESULTING IN SERIOUS INJURY AND EVEN DEATH.

AN ESTIMATED **5-10** ARC FLASHES HAPPEN DAILY IN THE U.S.<sup>6</sup>

THE BLAST RELEASES MOLTEN METALS, HOT METALLIC OXIDES AND TOXIC BURNING SMOKE



ARC BLAST

ARC FLASH

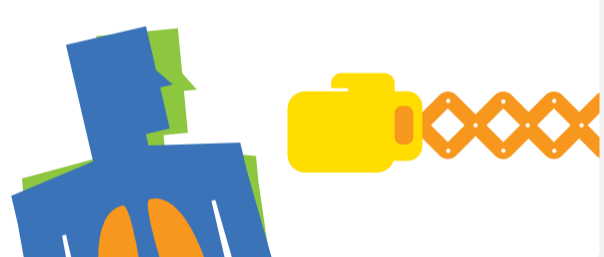
ELECTRIC SHOCK

MOLTEN METAL

SHRAPNEL

## THE DANGERS OF ARC FLASH

With a **700 mph**, projectile-producing pressure, the blast wave can throw a person across the room.



During a recent 12-year period in the mining industry,

**36,000+**

lost work days recorded for all electrical injuries.<sup>6</sup>



As loud as a jet engine.<sup>7</sup>

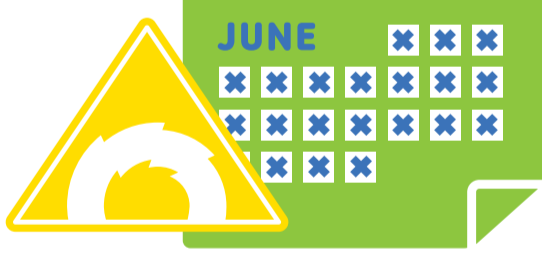
**+140dB.**



In the mining industry, electrical arc flash incidents are the most common cause of non-fatal electrical injuries.<sup>6</sup>

**DANGER**

## THE COST OF ARC FLASH



The average of lost work days at a mine site per arc flash incident was<sup>6</sup>

**21 days**

### Doctor's Bill

- \$\$\$ HEALTHCARE
- \$\$ WORKERS COMPENSATION
- \$\$ NEW EQUIPMENT
- \$ INCREASED INSURANCE PREMIUM
- \$ LOST PRODUCTION TIME

One arc flash can cost up to<sup>8</sup> **\$15 million**



## PREVENTING ARC FLASH INCIDENTS

### GE'S SAFETY RECOMMENDATIONS:

#### ENSURE PROPER TRAINING

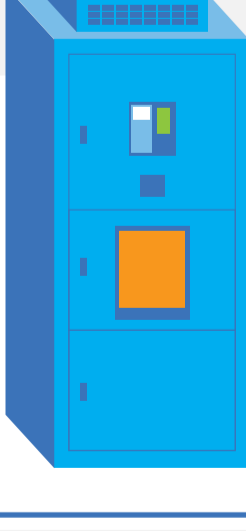
- ✓ Attend IEEE Events
- ✓ Attend NFPA 70E training for qualified individuals
- ✓ Enroll in Plant Engineering's Arc Flash University

#### PERFORM HAZARD ANALYSIS

- ✓ Evaluate your system for hazard locations
- ✓ Calculate incident energy exposure & arc flash boundaries
- ✓ Use warning labels to indicate arc flash hazards

#### INTEGRATE ARC FLASH MITIGATION BY DESIGN

- ✓ Consider arc resistant equipment for new installations
- ✓ Install devices to deliver energy vs. contain energy
- ✓ Solutions for fast fault clearing



### IS YOUR MINE PREPARED FOR ELECTRICAL SAFETY?

For more information on arc flash and electrical hazards, visit [www.geindustrial.com/arcflash](http://www.geindustrial.com/arcflash), and to learn how GE is working with customers in the mining industry to reduce their risk of arc flash, visit [www.geindustrial.com/mining](http://www.geindustrial.com/mining).

• Deloitte's Tracking the Trends 2013 report: <http://bit.ly/UifXMy> <sup>1</sup>  
 • Australian Jobs report for the Department of Education, Employment and Workplace Relations: <http://bit.ly/XiqGgA> <sup>2</sup>  
 • The Mining Association of Canada: <http://bit.ly/WenPi6> <sup>3</sup>  
 • National Mining Association: <http://bit.ly/VvCbym> <sup>4</sup>  
 • The Mincom Annual Study: Mining Executive Insights: <http://bit.ly/UrnndsE> <sup>5</sup>  
 • Center for Disease Control and Prevention's "Reducing Non-contact Electric Arc Injuries: An Investigation of Behavioral and Organizational Issues" report: <http://1.usa.gov/UaiRss> <sup>6</sup>  
 • GE Industrial Solutions' "Arc Flash: The Real Danger of Conducting Business" fact sheet <sup>7</sup>  
 • A 1999 Electric Power Research Institute (EPRI) study pegged total direct and indirect costs of an arc flash incident <sup>8</sup>