

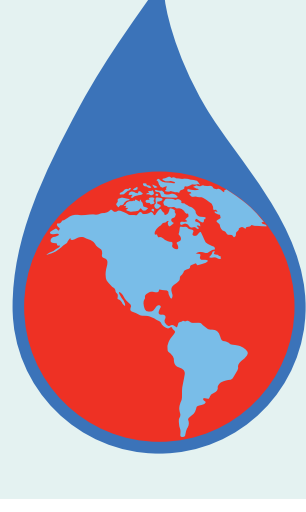
# ELECTRICAL SAFETY IN OIL & GAS



Brought to you by GE's Industrial Solutions business

With rapid industry growth, electrical safety is a key issue in the oil & gas industry.

## OIL & GAS INDUSTRY IS GROWING



This year, global oil demand will increase by **840,000** barrels per day (bpd). Global oil demand is now expected to total **90.2 million** bpd in 2013.<sup>1</sup>

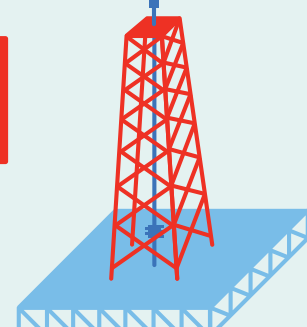
From 2007-2011, U.S. oil & gas drilling and extraction jobs rose<sup>2</sup>

**+73,000**



The heightened demand for heavy oil and natural gas will require thousands of new employees.

HELP WANTED



Global demand for energy continues to grow, especially in developing countries such as China<sup>3</sup>, the Middle East<sup>4</sup> and Brazil<sup>5</sup>.



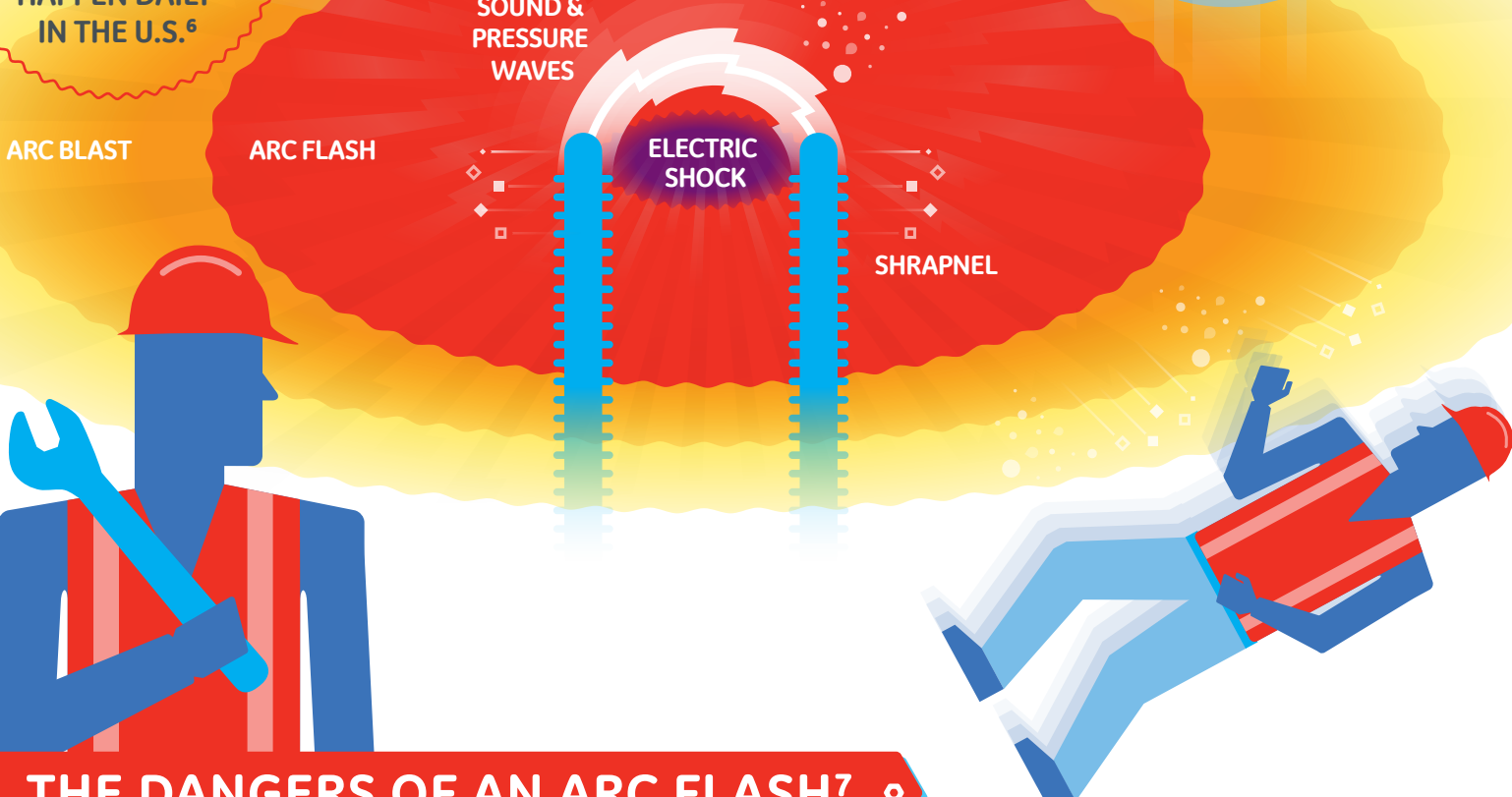
Rapid industry growth puts extra importance on protecting employees and equipment from electric hazards like arc flashes.

## WHAT IS AN ARC FLASH?

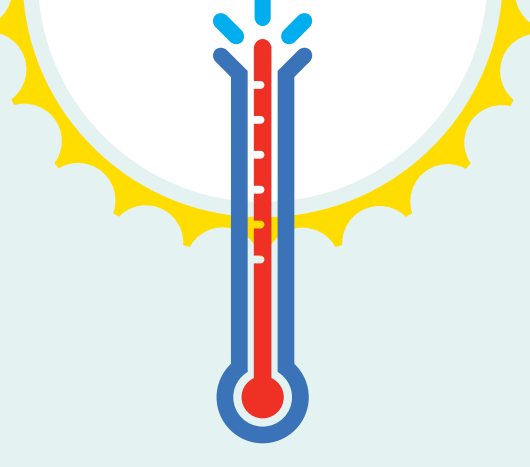
AN ARC FLASH IS A RELEASE OF HEAT ENERGY. THEY ARE OFTEN VIOLENT RESULTING IN SERIOUS INJURY AND EVEN DEATH.

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

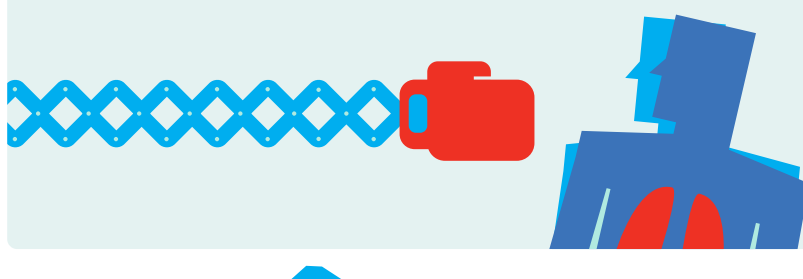


## THE DANGERS OF AN ARC FLASH<sup>7</sup>



Temp. exceeding **35,000°F** Hotter than the surface of the sun.

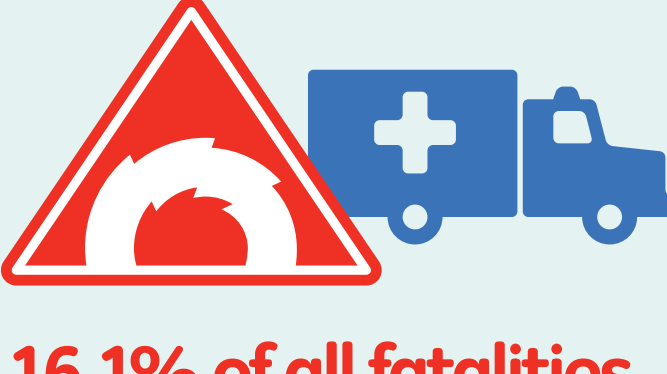
With a **700 mph**, projectile-producing pressure, the blast wave can throw a person across the room.



An arc flash has a serious-injury radius greater than **DANGER! >10 ft.**

As loud as a jet engine. **+140dB.**

## THE COST OF ARC FLASH



**16.1% of all fatalities** at oil fields were caused by an electrical accident, explosion or burn.<sup>8</sup>

### Doctor's Bill

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

One arc flash can cost up to **\$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

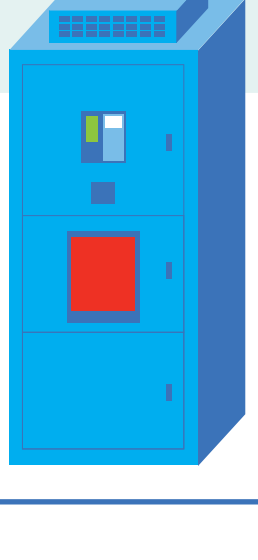
- Evaluate your system for hazard locations
- Calculate incident energy exposure & arc flash boundaries
- Use warning labels to indicate arc flash hazards

#### 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 OIL & GAS FACILITY 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 oil & gas industry to reduce their risk of arc flash, visit [www.geindustrial.com/oilandgas](http://www.geindustrial.com/oilandgas).



• OPEC 'Monthly Oil Market Report', February 2013: <http://bit.ly/Z87TWe><sup>1</sup>

• Brookings' 'The Role of Oil and Gas in Driving Job Growth' report: <http://bit.ly/RbKeRe><sup>2</sup>

• BP Energy Outlook 2030 - China Insights: <http://bit.ly/Z7n9OS><sup>3</sup>

• BP Energy Outlook 2030 - Middle East Insights: <http://bit.ly/VRLZof><sup>4</sup>

• BP Energy Outlook 2030 - Brazil Insights: <http://bit.ly/Y1aR9t><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>

• International Association of Oil & Gas Producers' 'Safety Performance Indicators - 2010 Data' report: <http://bit.ly/WerIDV><sup>8</sup>

• A 1999 Electric Power Research Institute (EPRI) study pegged total direct and indirect costs of an arc flash incident.<sup>9</sup>