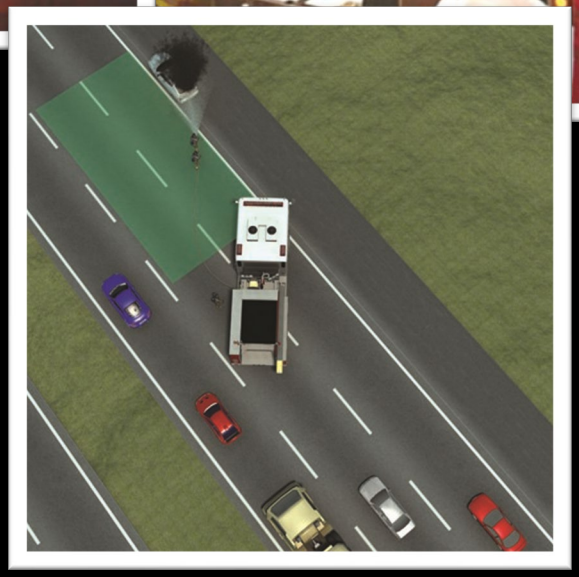
Personal Protective Equipment/Safety

Module 3

All firefighters must conduct emergency operations in a safe manner



During Any Given Year

100 firefighters will be killed in the line of duty

An additional 81,000 will be injured

Most firefighters will be injured during their career

Risk vs. Benefit

Introduction

Risk a lot to save a lot

Risk a little to save a little

Risk nothing to save nothing

Firefighter Injuries

Statistics and Injury Prevention

100,000+ total firefighter injuries in 1981

60,000 total firefighter injuries in 2021

Photo courtesy of Michael Dick

32% of total injuries occurred on the fireground

- 45% strains and sprains
- 13% wounds and cuts
- 6% burns
- 5% smoke inhalation

Many types of personal protective equipment (PPE) are used by firefighters

Purpose of PPE

Introduction

Photo courtesy of Jeff French

PPE

is your first line of defense

Designed

to protect from the day-to-day risks

Limitations of PPE

Introduction

PPE

does have its limitations

Photo courtesy of Diane Gibson

Shouldn't

be considered as last line of defense

Understanding

protection provided by PPE is crucial to safety

Provides Protection

Introduction

Smoke

Fire

Heat

Bodily Fluids

Sharp Objects

Hazmat

Photos courtesy of Brett M. Dzadik , Jeff French, and Pullman FD

Types of PPE

Types of Ensembles

Firefighters

must know their options

Station Wear

Wildland/Brush

Proximity

Photo courtesy of Westport FiD (CT)

Firefighters

must know their options

Medical

Technical Rescue

Hazmat

Photo courtesy of Westport FiD (CT)

Firefighters

must know their options

Water Rescue

Structural Firefighting

Use PPE only for designated purpose

Photo courtesy of William Seward

Photo courtesy of Fireground Strategies, Anthony Avillo

NFPA Standards

Types of Ensembles

NFPA standards address PPE

- Firefighters must understand requirements/regulations for:
  - Design
  - Testing
  - Maintenance

Station Wear

Types of Ensembles: *Station Wear*

Covered

by NFPA 1975

Minimally,

should meet ignition and flame spread testing specs

Considered

a work uniform

Wildland/Brush

Types of Ensembles: *Wildland/Brush*

Fully-

outfitted wildland firefighter

Wildland/Brush

Personal shelters

- Wildland PPE will not protect from extreme heat
- Self-deployable shelter issued to personnel
- Constructed of aluminized material
- Reflects heat during a rollover
- Used as a last line of defense

Medical PPE

Types of Ensembles: *Medical PPE*

Fully-

outfitted EMS PPE

Technical Rescue PPE

Types of Ensembles: *Technical Rescue PPE*

Fully-

outfitted firefighter
technical rescue PPE

Water Rescue PPE

Types of Ensembles: *Swift Water Rescue PPE*

Fully-

outfitted firefighter water rescue PPE

Hazardous Materials PPE

Level A Protection

- Protects from liquids and/or vapors
- Requires full use of SCBA

Photo courtesy of Tom Lenart

Hazardous Materials PPE

Types of Ensembles: *Hazardous Materials PPE*

Level B Protection

- Only protects from liquids
- Requires full use of SCBA
- HazMat Team carries Level B

Photo courtesy of Bob Sprague

Hazardous Materials PPE

Types of Ensembles: *Hazardous Materials PPE*

Level C Protection

- Same level of protection as Level B
- Does not require the use of SCBA

Hazardous Materials PPE

Types of Ensembles: *Hazardous Materials PPE*

Level D Protection

- Lowest level of protection
- Structural PPE is considered Level D protection

Proximity PPE

Types of Ensembles: *Proximity*

Fully-

outfitted firefighter in proximity PPE

Structural PPE Components

Structural Firefighting PPE

- Boots
- Pants
- Coat/Jacket
- Gloves
- Hood
- SCBA
- Helmet

Structural Firefighting PPE & Equipment

Structural Firefighting PPE

SCBA

PASS Devices

Structural PPE

Firefighting Applications

Types of Respiratory Protection

SCBA

- Self-Contained Breathing Apparatus
- Critical tool for structural firefighting and other emergencies

Photo courtesy of MSA

Provides Protection in IDLH Atmospheres

Use of SCBA

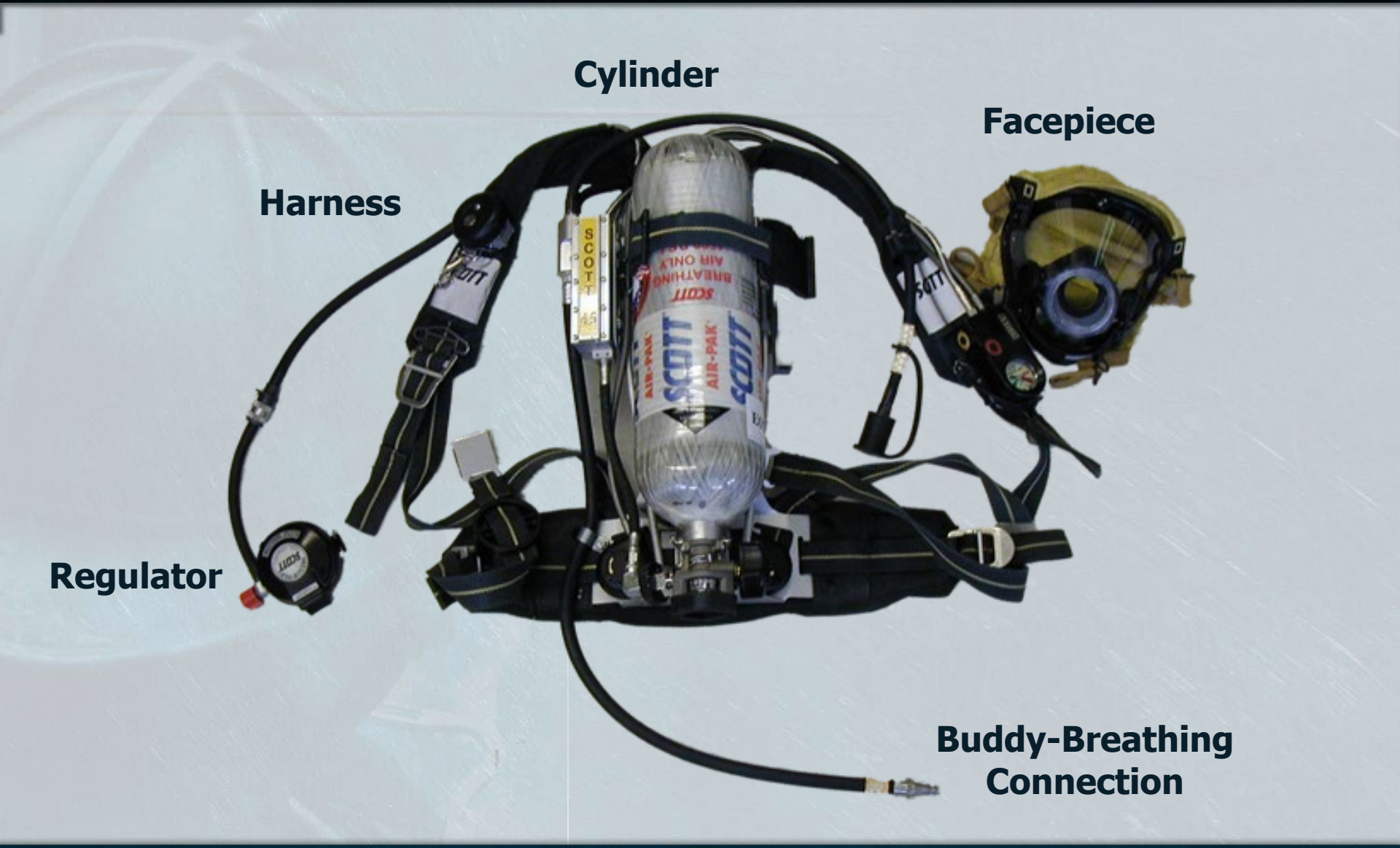
IDLH environments

- Immediately Dangerous to Life and Health
- Single exposures may be fatal
- Low level exposures over a long term may cause serious health issues as well as cancer

Photo courtesy of Jim Duffy

Main Components

Components of the SCBA



Regulator Assemblies

Components of the SCBA

First stage regulators

- Reduces pressure from bottle pressure to about 100 psi

Second stage regulators

- Reduces pressure from 100 psi to just above atmospheric (positive) pressure

Buddy Breathing

Components of the SCBA

- Allows 2 firefighters to breath from 1 SCBA
- Will Alternate Breathes pulling from Higher Pressured cylinder first, then alternating from each when equalized

Common Methods

Donning and Doffing the SCBA

Over-the-Head

Coat Method

Seat-Mounted