
Firefighter Personal Protective Equipment Module 3

Chapter 6



LEARNING OBJECTIVES

Explain methods for storing respiratory protection equipment.

Summarize general considerations for protective breathing apparatus inspections and care.

Describe general donning and doffing considerations for protective breathing apparatus.



LEARNING OBJECTIVES

**Summarize
safety
precautions
for refilling
SCBA
cylinders.**

**Explain safety
precautions
for SCBA use.**

**Describe
nonemergency
exit techniques.**

**Explain
procedures for
replacing SCBA
cylinders.**

**Describe
nonemergency
and
emergency
exit indicators.**

**Demonstrate
the method
for donning
structural
personal
protective
clothing for
use at an
emergency.**



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LEARNING OBJECTIVES

With structural personal protective clothing in place, demonstrate the over-the-head method of donning an SCBA.

With structural personal protective clothing in place, demonstrate the method for donning an SCBA while seated.



With structural personal protective clothing in place, demonstrate the coat method of donning an SCBA.



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LEARNING OBJECTIVES

Doff personal protective equipment, including respiratory protection, and prepare for reuse.

Demonstrate the steps for cleaning an SCBA.

Demonstrate the steps for inspecting an SCBA.

Demonstrate the method for filling an SCBA cylinder from a cascade system, wearing appropriate PPE, including eye and ear protection.



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LEARNING OBJECTIVES

Demonstrate the method for filling an SCBA cylinder from a compressor/purifier system, wearing appropriate PPE, including eye and ear protection.

Demonstrate the two-person method for replacing an SCBA cylinder.



Demonstrate the one-person method for replacing an SCBA cylinder.



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FOLLOW THESE GENERAL CONSIDERATIONS WHEN DONNING SCBA.

✓ Beginning
of shift

✓ Air cylinder
gauge

✓ Remote
gauge

✓ Harness
and facepiece
straps

✓ Operate all
valves

✓ Low-
pressure
alarm

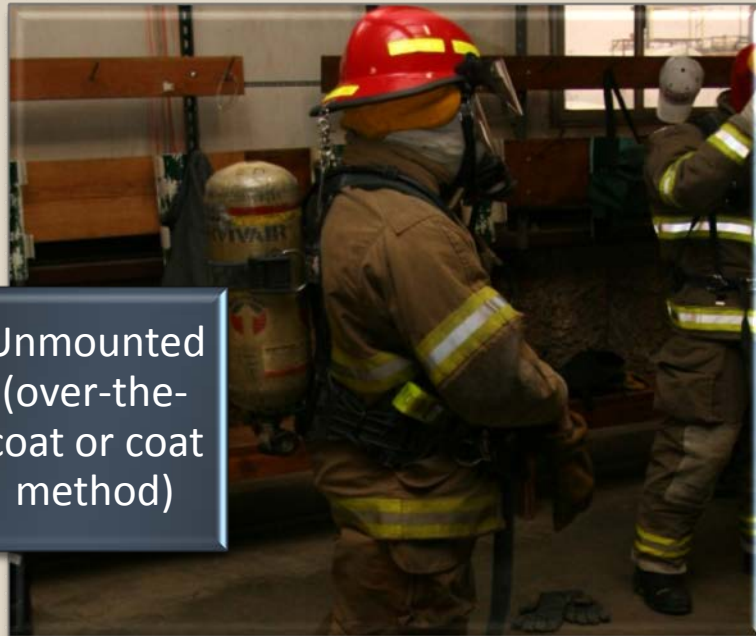
✓ PASS device

✓ Battery-
powered
functions



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SCBA CAN BE DONNED IN SEVERAL WAYS.



Unmounted
(over-the-
coat or coat
method)



Seat mount

Courtesy of Kenneth Baum



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CAUTION

Never connect the regulator and breathe cylinder air when seated in the apparatus. This activity will deplete your air supply before you arrive at the incident.



SCBA CAN BE DONNED IN SEVERAL WAYS.



Side or
rear
external
mount

Courtesy of Ron Bogardus

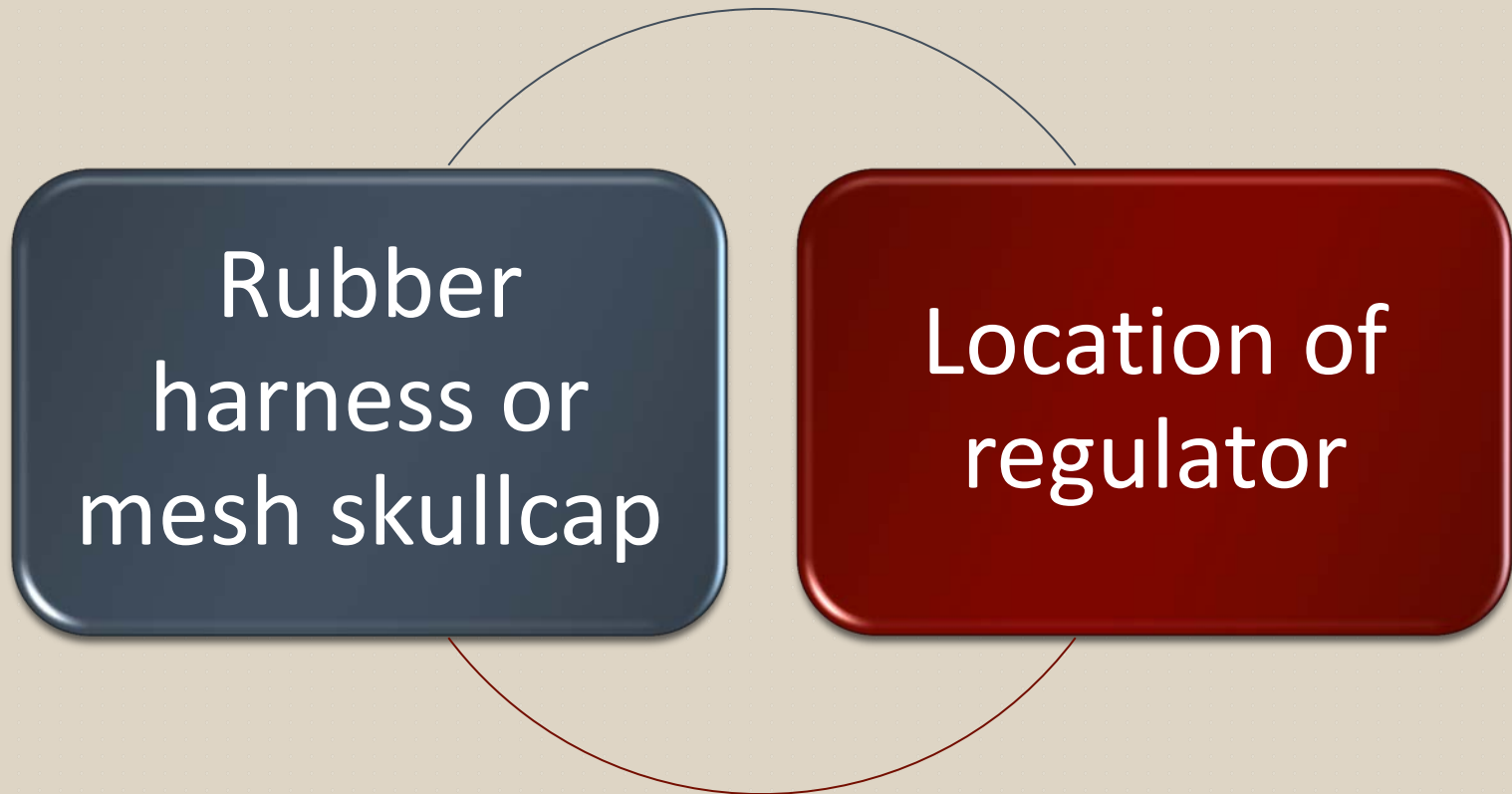


Backup
mount



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BE AWARE OF TWO IMPORTANT DIFFERENCES AMONG SCBA FACEPIECES.



FOLLOW THESE GENERAL CONSIDERATION WHEN DONNING SCBA FACEPIECES.

✓ Straps fully
extended

✓ No hair in face
seal

✓ Chin cup and
harness centered

✓ Straps pulled
simultaneously
to rear

✓ Sealed,
connected, and
exhaling properly

✓ Protective
hood over
harness or straps

✓ Helmet
secured with
chin strap



FOLLOW THESE GENERAL CONSIDERATIONS WHEN DOFFING SCBA FACEPIECES.

✓ Clear of
contaminated
area

✓ Discontinue
air flow

✓ Disconnect
from facepiece

✓ Remove
protective hood

✓ Loosen straps;
remove
facepiece

✓ Remove
backpack;
protect regulator

✓ Close valve

✓ Relieve
pressure



FOLLOW THESE GENERAL CONSIDERATIONS WHEN DOFFING SCBA FACEPIECES.

✓ Turn off
PASS

✓ Extend
straps

✓ Check
pressure

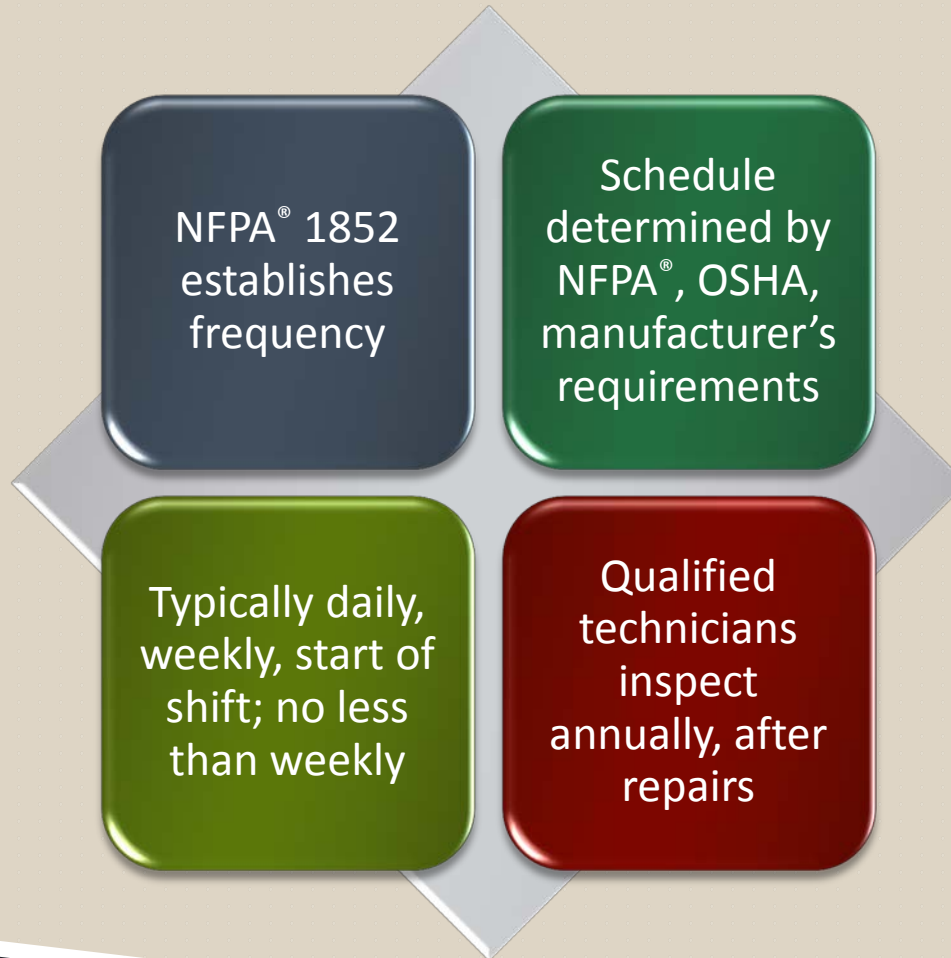
✓ Clean
facepiece

✓ Clean other
parts

✓ Secure in
proper
storage



SEVERAL FACTORS DETERMINE HOW FREQUENTLY SCBA IS INSPECTED.



SCBA MUST BE INSPECTED REGULARLY, AND DAMAGE REPORTED IMMEDIATELY.

Facepiece

- Frame
- Head-harness buckles, straps, webbing
- Lens for damage
- Heads-up display (HUD)
- Lens for seal with frame
- Valve seat of exhalation valve
- Springs and covers
- Regulator and hose connection points
- Speaking diaphragm



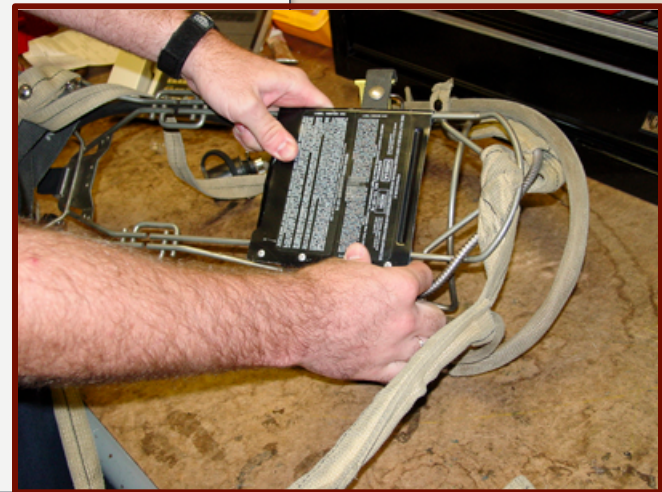
Courtesy of Kenneth Baum



SCBA MUST BE INSPECTED REGULARLY, AND DAMAGE REPORTED IMMEDIATELY.

Backplate and harness assembly

- Abrasions, cuts, tears,
- Heat/chemical damage
- Fasteners/adjustment operate
- Straps extended
- Cylinder retention system
- Cylinder attached



Courtesy of Kenneth Baum



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SCBA MUST BE INSPECTED REGULARLY, AND DAMAGE REPORTED IMMEDIATELY.

Breathing air cylinder assembly

- Hydrostatic test date
- Cylinder gauge
- Cylinder body
- Composite cylinders
- Cylinder valve outlet
- Valve hand wheel
- Burst disc outlet
- Cylinder full



Courtesy of Kenneth Baum



SCBA MUST BE INSPECTED REGULARLY, AND DAMAGE REPORTED IMMEDIATELY.

Hoses

- Abrasions, bubbling, cuts
- Cracks, heat/chemical damage
- Fittings
- “O” ring
- Hose connections

Low-pressure alarm

- Alarm and hardware for:
 - Cleanliness
 - Attachment
 - Damage
- Test alarm

Regulator

- Controls, housing and relief devices for:
 - Cleanliness
 - Operates
 - Damage
- Unusual sounds
- Valve functions properly



SCBA MUST BE INSPECTED REGULARLY, AND DAMAGE REPORTED IMMEDIATELY.

Pressure indicator gauges

- Inspect for cleanliness, damage
- Gauge readings are within manufacturer's limits

Integrated PASS

- Inspect for cleanliness, wear, damage
- Securely attached
- Test all modes
- Test low battery warning



PROPER CARE FOR SCBA MEANS CLEANING AND SANITIZING AFTER EACH USE.

Debris
cause
malfunction

Wash
facepiece

Dry
facepiece
properly

Do not
submerge



PROPER CARE FOR SCBA MEANS CLEANING AND SANITIZING AFTER EACH USE.



Sanitize



Prevent
fogging



Personalized
facepiece



Store
properly



TRAINED AND QUALIFIED PERSONNEL PERFORM ANNUAL INSPECTION AND MAINTENANCE.



Courtesy of Kenneth Baum

Department members
or contractors



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FREQUENCY OF SCBA AIR CYLINDER HYDROSTATIC TESTING VARIES BY MATERIAL.



Courtesy of Kenneth Baum

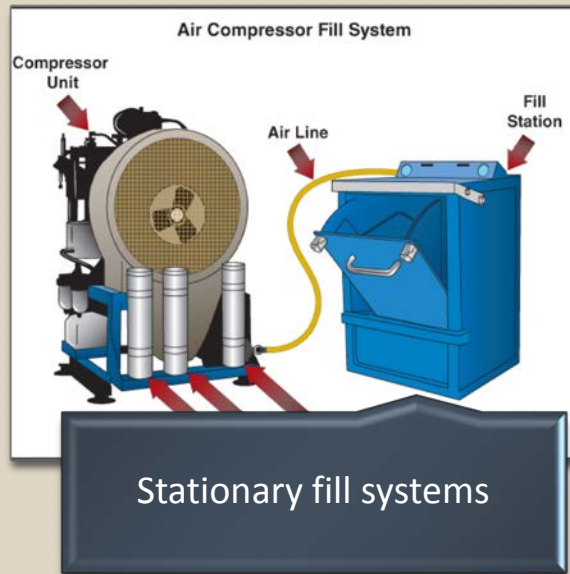
Stamp or label provides testing dates

Material
Steel/aluminum
Hoop-wrapped aluminum
Fully wrapped fiberglass
Fully wrapped Kevlar™
Fully wrapped carbon fiber



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THREE SOURCES CAN BE USED TO REFILL SCBA AIR CYLINDERS.



Courtesy of James Nilo

Courtesy of Brandon Wagoner



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FOLLOW THESE GENERAL GUIDELINES AND PRECAUTIONS FOR ALL FILL SYSTEMS.

✓ Type 1 Grade D quality air required

✓ Check hydrostatic test date

✓ Visually inspect for damage

✓ Eye/ear PPE

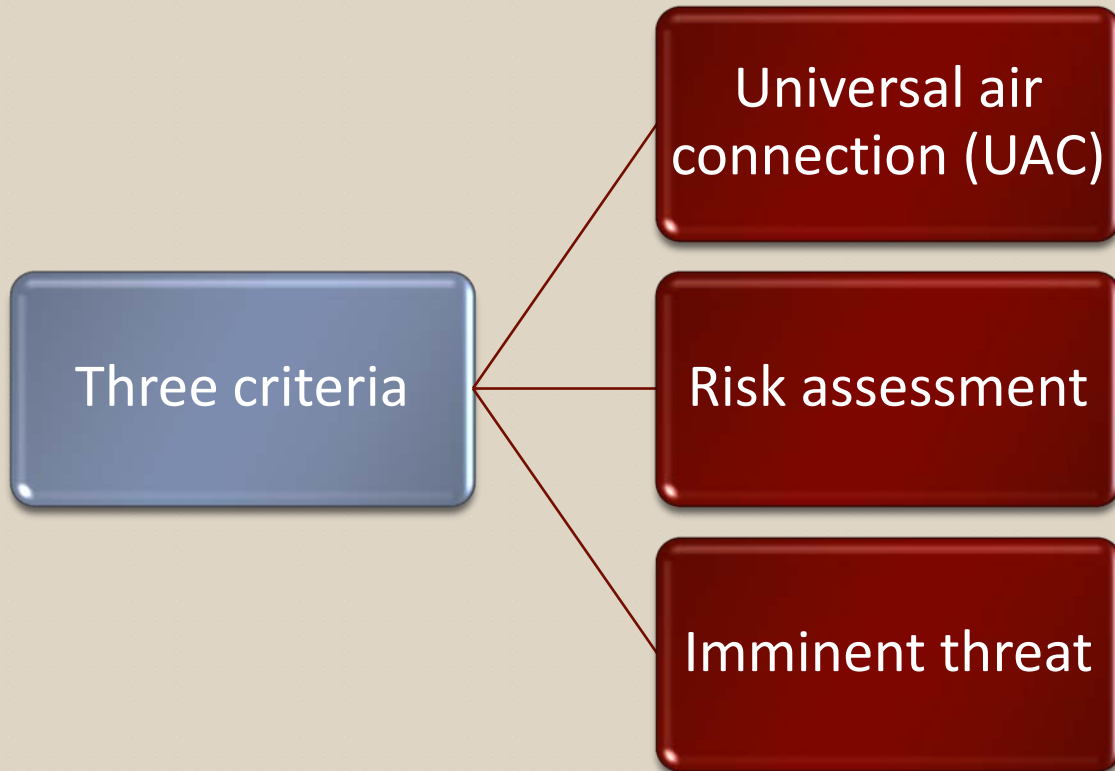
✓ Use shielded fill station

✓ Fill slowly to prevent overheating

✓ Completely full, not over pressurized



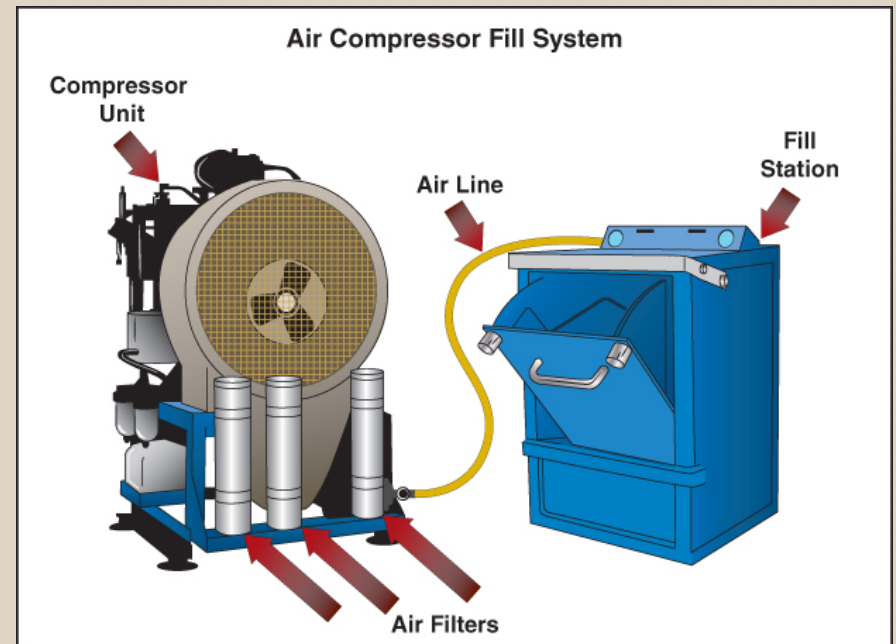
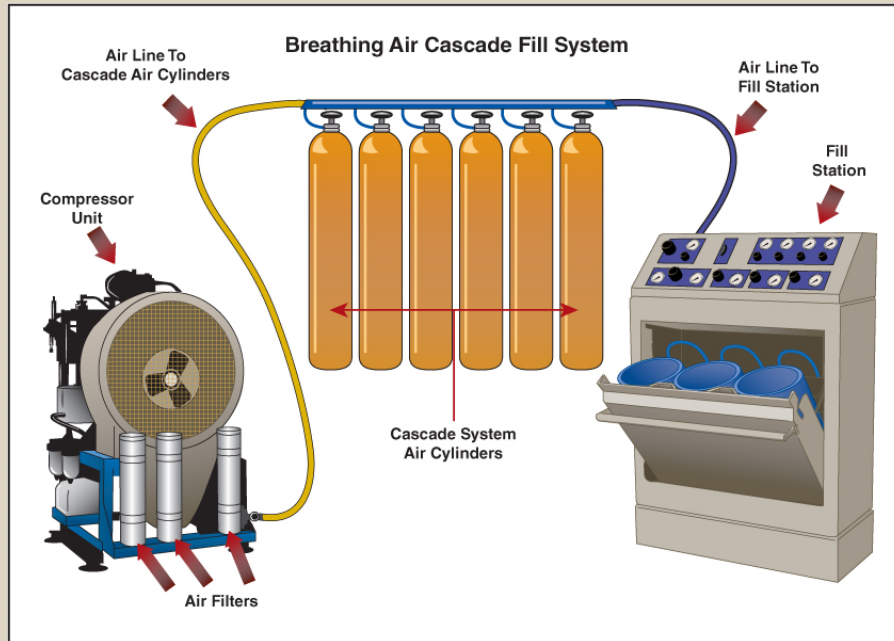
REFILLING UNSHIELDED CYLINDERS WHILE DONNED IS PROHIBITED, BUT RIC/RITS ARE GRANTED EXCEPTIONS.



Courtesy of Kenneth Baum



STATIONARY FILL SYSTEMS USE CASCADE SYSTEM OR FILL DIRECT FROM COMPRESSOR.



FOLLOW THESE SAFETY PRECAUTIONS WHEN USING STATIONARY FILL STATIONS.

✓ Trained personnel only

✓ Inspect before filling

✓ Eye/ear PPE

✓ Shielded fill station

✓ Fill slowly to prevent overheating

✓ Filled to capacity



MOBILE FILL STATIONS ARE USED AT EMERGENCY INCIDENTS.



Courtesy of James Nilo



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FIREFIGHTING BREATHING AIR REPLENISHMENT SYSTEM (FBARS) ARE USED IN HIGHRISE BUILDINGS.



Courtesy of Brandon Wagoner



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REPLACE SCBA CYLINDERS ONLY IN SPECIFIC CIRCUMSTANCES.

Training

Long-duration
operations



After any
operation



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SEVERAL SAFETY PRECAUTIONS MUST BE CONSIDERED WHEN USING SCBA.

Use properly fit tested facepiece

Air supply duration varies



Monitor for signs of fatigue

Activated and on in contaminated areas



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SEVERAL SAFETY PRECAUTIONS MUST BE CONSIDERED WHEN USING SCBA.

Work in teams

Check supply frequently

Test
atmosphere

Exit before alarm



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EXIT PROCEDURES HELP YOU MAKE RAPID EXITS FROM MANY TYPE INCIDENTS.



Nonemergency
exits



Emergency
exits



NONEMERGENCY EXIT INDICATORS ARE THE MOST COMMON.

Situation stabilized

Shift in strategy

Replace cylinder

IC command

Assignment complete



EMERGENCY EXIT INDICATORS SIGNAL LIFE THREATENING SITUATIONS.

Low-pressure alarm or SCBA failure

IC or safety officer command

APR/PAPR damage

Increased respiratory hazards or PEL met or exceeded

Change in conditions, O₂, temp, or new hazards



IC MONITORS POTENTIAL HAZARDS BUT YOU SHOULD MONITOR YOUR OXYGEN LEVELS.



- Light-headed
- Disorientated
- Loss of coordination
- Increased breathing rates
- Rapid fatigue



NONEMERGENCY EXIT TECHNIQUES ARE BASED ON INCIDENT COMMAND SYSTEMS (ICS) AND NFPA® 1500.



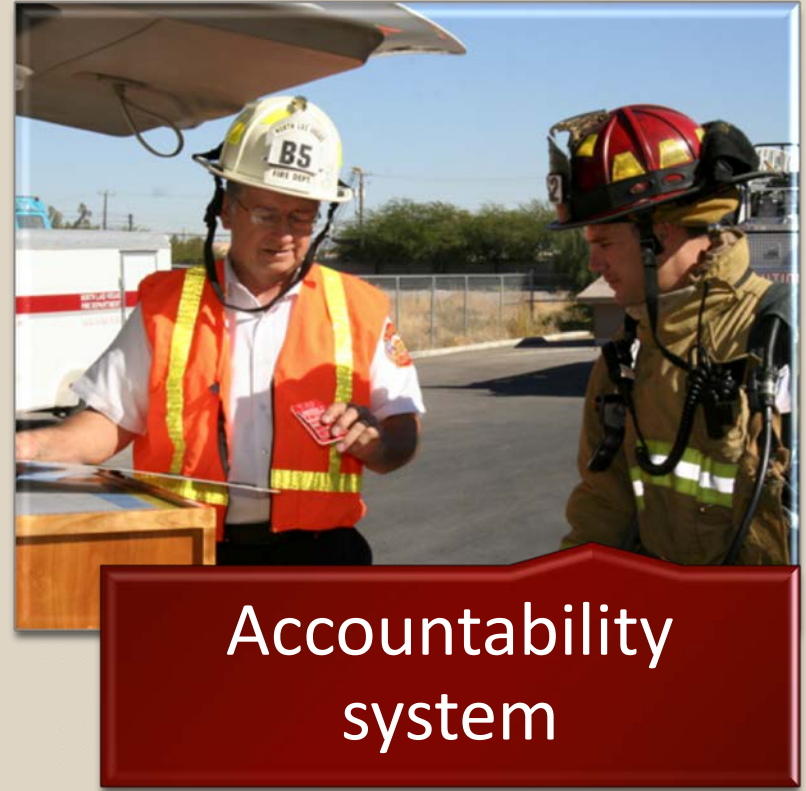
Buddy system



Controlled breathing



NONEMERGENCY EXIT TECHNIQUES ARE BASED ON INCIDENT COMMAND SYSTEMS (ICS) AND NFPA® 1500.



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SUMMARY

Respiratory equipment can protect you from toxic gases and vapors, particulates, and disease, but only if properly used, inspected, cleaned, and maintained.



Knowing how to select the type of respiratory equipment that is appropriate, as well as manage your air supply, are also important.

