IAC 2303 Airline Safety Management

UNIT 7:Fire Fighting

ELEMENTS OF FIRE

Remove Heat

Remove Fuel

Remove O2

- **Heat**

A heat source is responsible for the initial ignition of fire. Heat allows fire to spread by drying out and preheating nearby fuel and warming surrounding air.

- **Fuel**

Is any kind of combustible material. It's characterized by its moisture content, size, shape, quantity and the arrangement in which it is spread over the landscape. The moisture content determines how easily it will burn.

- **Oxygen**

Air contains about 21 percent oxygen, and most fires require at least 16 percent oxygen content to burn. Oxygen supports the chemical processes that occur during fire.

When fuel burns, it reacts with oxygen from the surrounding air, releasing heat and generating combustion products (gases, smoke, embers, etc.). This process is known as oxidation.

Fire Classification

- **CLASS A: Class A fires involve common combustibles such as wood, paper, cloth, rubber, trash and plastics.**

- **CLASS B: Class B fires involve flammable liquids' gases, solvents, oil, gasoline, paint, lacquers, tars and other synthetic or oil-based products. Class B fires often spread rapidly and, unless properly secured, can reflash after the flames are extinguished.**

- **CLASS C: involve energized electrical equipment, such as wiring, controls, motors, data processing panels or appliances. They can be caused by a spark, power surge or short circuit .**

- **CLASS D: involve combustible metals such as magnesium and sodium. Combustible metal fires are unique industrial hazards which require special dry powder agents.**

  CLASS K: involve combustible cooking media such as oils and grease commonly found in commercial kitchens

Class of Fire	Type of Fire	Type of Extinguisher	Extinguisher Identification	Symbol
A	Ordinary combustibles: wood, paper, rubber, fabrics, and many plastics	Water, Dry Powder, Halon		
B	Flammable Liquids and Gases: gasoline, oils, paint, lacquer, and tar	Carbon Dioxide, Dry Powder Halon		
C	Fires involving Live Electrical Equipment	Carbon Dioxide, Dry Powder Halon		
D	Combustible Metals or Combustible Metal Alloys	Special Agents		No Picture Symbol 
K	Fires in Cooking Appliances that involve Combustible Cooking Media: Vegetable or Animal Oils and Fats			

Types

1. Engine Fire is detected by the aircraft fire detection and suppression systems. There is a risk that the fire may reignite and is advisable for the crew to land the aircraft as soon as possible.
2. Cabin Fire be detected early and be contained by the crew using onboard fire fighting equipment.
3. Hidden Fire be detected by onboard fire detection systems or by the crew or passengers noticing smoke or fumes.

Effects

- **Smoke & Fumes** Smoke can reduce visibility within the aircraft. The crew are unable to control the aircraft. Smoke and fumes are highly toxic and irritating to the eyes and respiratory system.

- **Heat** will affect aircraft systems and the structural which will lead to **Loss of Control**
-

Smoke can be observed directly if it is coming from a coffeemaker, oven, a seat video screen, or a passenger seat control box.

Sometimes a fire may not always be obvious, and smoke and flames may not always be visible, but there may be other indications that a potential fire is in progress.

Signs to be aware of include:

- Fumes or unusual odors
- Electrical malfunctions, for example, circuit breakers "tripping"
- Noises, such as, popping, snapping or crackling, which may indicate electrical arcing
- Hot spots on sidewalls, floors, and panels should be investigated.

Fire outside the aircraft

On ground

- Notify PIC&AP on location
- Follow PIC instruction

During flight

- Notify PIC&AP on location
- Keep monitor
- Follow PIC instruction

Fire Fighting Equipment

- **Water Extinguisher**

is very effective on class A fires (common combustibles like wood and paper).

- **Halon Extinguisher**

A liquefied, compressed gas that stops the spread of fire by chemically disrupting combustion.

Halon is rated for class "B" (flammable liquids) and "C" (electrical fires) , but it is also effective on class "A" (common combustibles) fires.

https://youtu.be/R-gqVUPrkJQ


INSTRUCTIONS
1 HOLD UPRIGHT.
PULL RING PIN.
2 START BACK 8 FEET
AIM AT BASE OF FIRE
3 SQUEEZE LEVER.
SWEEP SIDE TO SIDE
WARNING: THE CONCENTRATED AGENT WHEN APPLIED TO FIRE CAN PRODUCE TOXIC BY-PRODUCTS. AVOID INHALATION OF THESE MATERIALS BY EVACUATING AND VENTILATING THE AREA. DO NOT USE IN CONFINED SPACES OF LESS THAN 156 CUBIC FEET PER EXTINGUISHER.
H3R Aviation
(800) 249-4289 H3Raviation.com

HOW TO USE A FIRE EXTINGUISHER

Pull the pin or turn the handle.

Until the pin is released the extinguisher is locked. The pin needs to be removed to release the handle or lever.

Some water extinguishers require that the handle be turned in a clockwise direction, to pierce the CO2 cartridge and pressurize the extinguisher.

Aim at the base of the fire.

in order to remove the source of fuel.

Squeeze the top handle or lever.

This will release the extinguishing agent. Releasing the lever will stop the flow. should always be held upright.

Sweep from side to side.

stand 8/10 ft away (2.5m). As the fire reduces, move closer with the extinguisher. Always direct the nozzle at the base of the fire.

General Operating Techniques

1. Determine type of fire before obtaining an extinguisher. When in doubt, use a Halon

General Operating Techniques:

2. At least 2 persons fight a fire.
3. Hold extinguisher in vertical position.
4. Depending on type of fire & extinguisher used, stand as close to fire.

General Operating Techniques:

5. Direct at base of fire in a sweeping / circular motion depend on extinguisher
6. Face the fire, if fumes & heat are intense, turn head & body away.

7. Remove equipment producing oxygen out of the area.

8. Upon completion of fire fighting, soak the burnt area or material with water

FIRE FIGHTING TEAMWORK

- Fire Fighter - first C/A
- Communicator - second C/A
- The Assistant Firefighter -third C/A

- **Firefighter:** The first crewmember that finds the fire.
  - Alerts other cabin crewmembers
  - Obtains the nearest fire extinguisher
  - Immediately locates the source of the fire
  - Fights the fire.
- **Communicator :** relaying information to the flight deck, including the location, source, and severity of the fire. In addition to keeping the flight deck updated with all relevant information.

- **The Assistant Firefighter:**
  - **Supplies extra firefighting equipment**
  - **Supports the firefighting effort**
  - **Removes flammable material from the area**
  - **The Assistant Firefighter must be prepared to replace the Firefighter, and exchange roles with the Firefighter, as required.**

Fire Fighting

Quick Action

- ***Fight the Fire***
- ***Notify flight deck crew (PIC)& AP.***
- ***Move Pax from area***
- ***Monitor the situation***

- **The information should be clear and concise, and reflect the conditions in the cabin. Remember to "Keep it Simple"!**
  - **Location**
  - **Source (if possible)**
  - **Severity (density, color, odor, how it is affecting people)**
- **Action taken (Firefighting progress ,Number of fire extinguishers used , Time firefighting action started)**

Fire in a cabin

A significant Fire in the passenger cabin, a lavatory, galley, or luggage compartment within the cabin during flight is among the worst situations that crew can be faced with.

Overhead stowage bin fire

Treat as electrical fire

Check for heat. Using the back of the hand, feel the overhead bin to determine the temperature and presence of fire.

Remove pax from the area **OSCAR**

Open overhead bin slowly and slightly *Enough to pass the nozzle of the fire extinguisher*

Spray Halon

Close bin and monitor

Await 30 seconds

Re-check to ensure fire is out

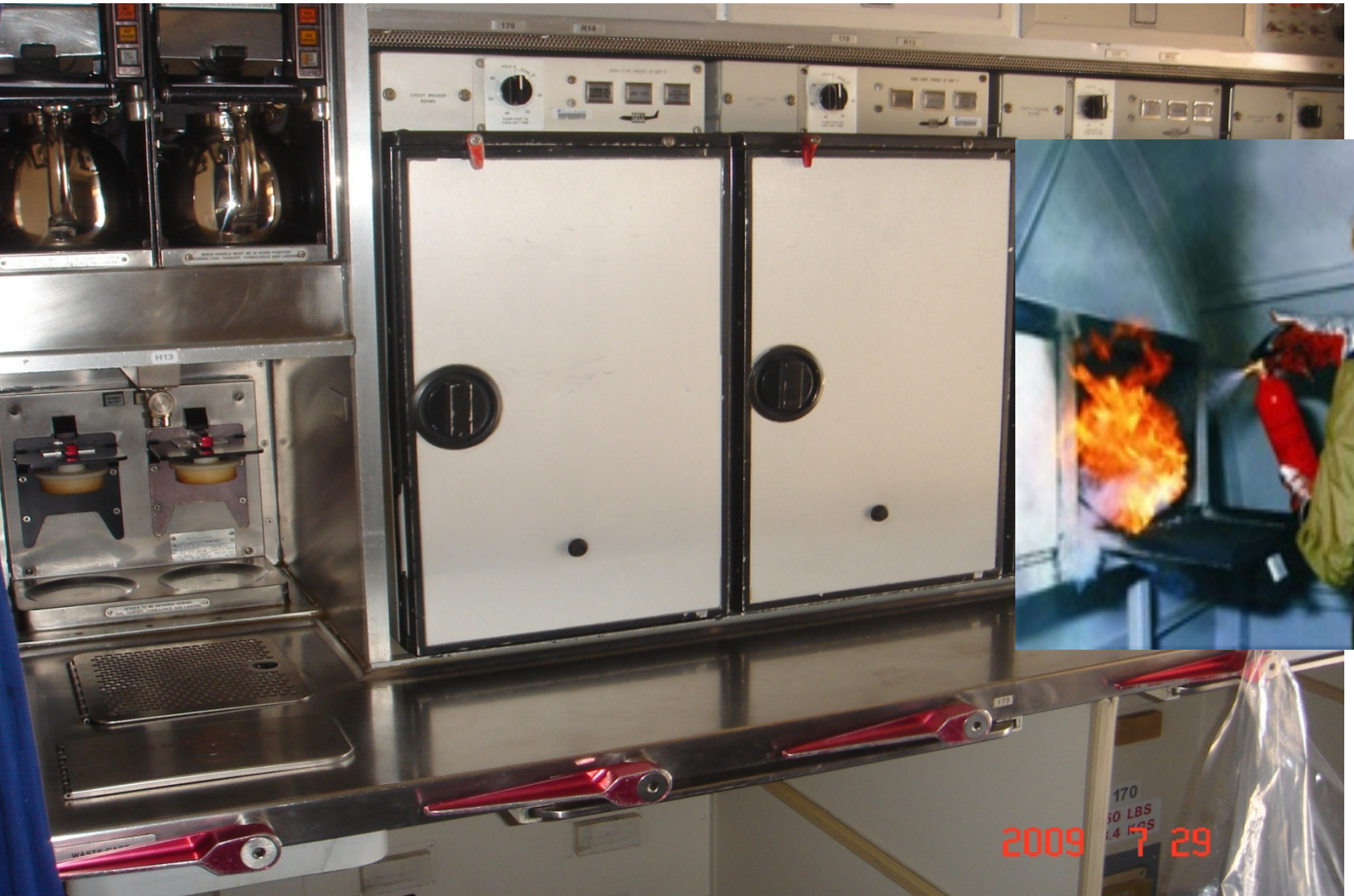
Use water liquid to soak the objects

Check surrounding area for any sign of fire


Don PBE if possible
EXIT/IZEJA

Electrical Fire

Think - **Circuit Breaker & power*



Fire connected to an electrical source (for example, a coffeemaker), the circuit breaker relating to that coffeemaker should be pulled.

If the source of the smoke cannot be identified, and is coming from the galley area, isolate the area by using the “galley shutoff”, or by pulling all of the galley circuit breakers to cut off the power source.


@fahad_4381
GALLEY/
COMMERCIAL
SUPPLY
RCCB
ECMU
CBMU

Concealed Fire, if suspected

LAVATORY FIRE

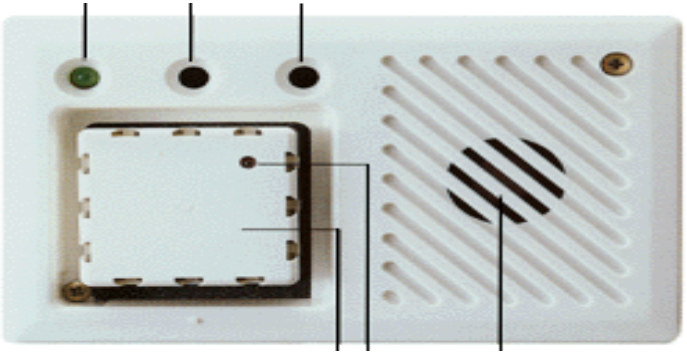
If lavatory smoke detector activated;

1)Identify the lavatory with flashing red light

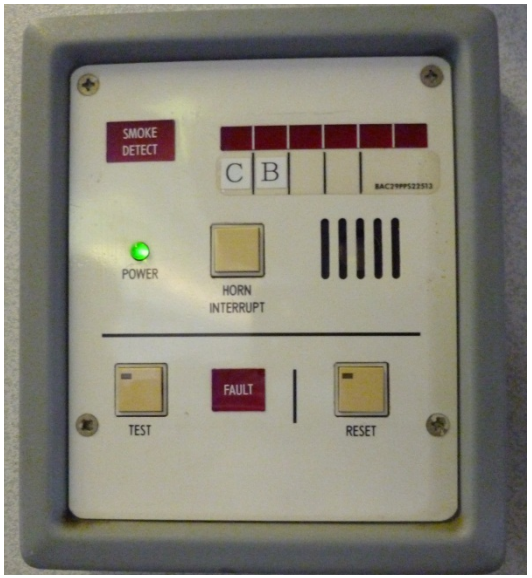
2)Switch off the horn

3)Check the applicable lavatory

4)Start fire fighting procedure



HS-NGA



HS-NGC

LAVATORY FIRE (cont)

If lavatory door is cool.

- Open door slowly with caution
- Keep low below smoke.
- Locate the fire source,
  remove panel if necessary
- discharge HALON extinguisher at base of fire.

LAVATORY FIRE (cont)

If lavatory door is HOT

the fire is at a critical stage. Have extra fire fighting equipment available and ready to use.

PBE.....DON

- **Open door slightly,** *Stay low, and crouch down,*
- *use door as protections*
- **Spray HALON inside and**
- **Close door**
- **Await for 30 seconds (PBE &HALON standby)**
- **Re-check the fire inside is out and keep monitor**


PBE
TRAINING


INSTRUCTIONS
TRAINING ONLY
CABIN CREW

Smoke removal

- Think that smoke is a by product of fire
- Check the area to feel the heat and smell
- If found Notify PIC & Pur
- In case of smoke exceeding and remain in the cabin, Smoke removal can be done by flight crew.

SEE VDO - FAA Fire fighting

Smoke In Cabin

Source of smoke

- Engine or APU failure
- Electrical smoke
- Overheating fluorescent light
- Air conditioning system
- Waste container in lavatories
- Oven fire

Smoke In Cabin

- Think that Smoke is a by-product of fire
- Check the area to feel the heat and smell presenting
- If found, Notify PIC & AP

Smoke In Cabin

- Move pax from heavy smoke area
- Instruct pax to stay low, cover nose & mouth to breathe.
- Avoid opening flight deck door
- Avoid deploying emergency oxygen mask in the cabin.
- Combustible items must be remove; blanket, etc.

FLOOR LEVEL LIGHTING

https://www.smartcockpit.com/docs/Getting_To_Grips_With_Cabin_Safety.pdf