

Hyperbaric Emergency Simulations

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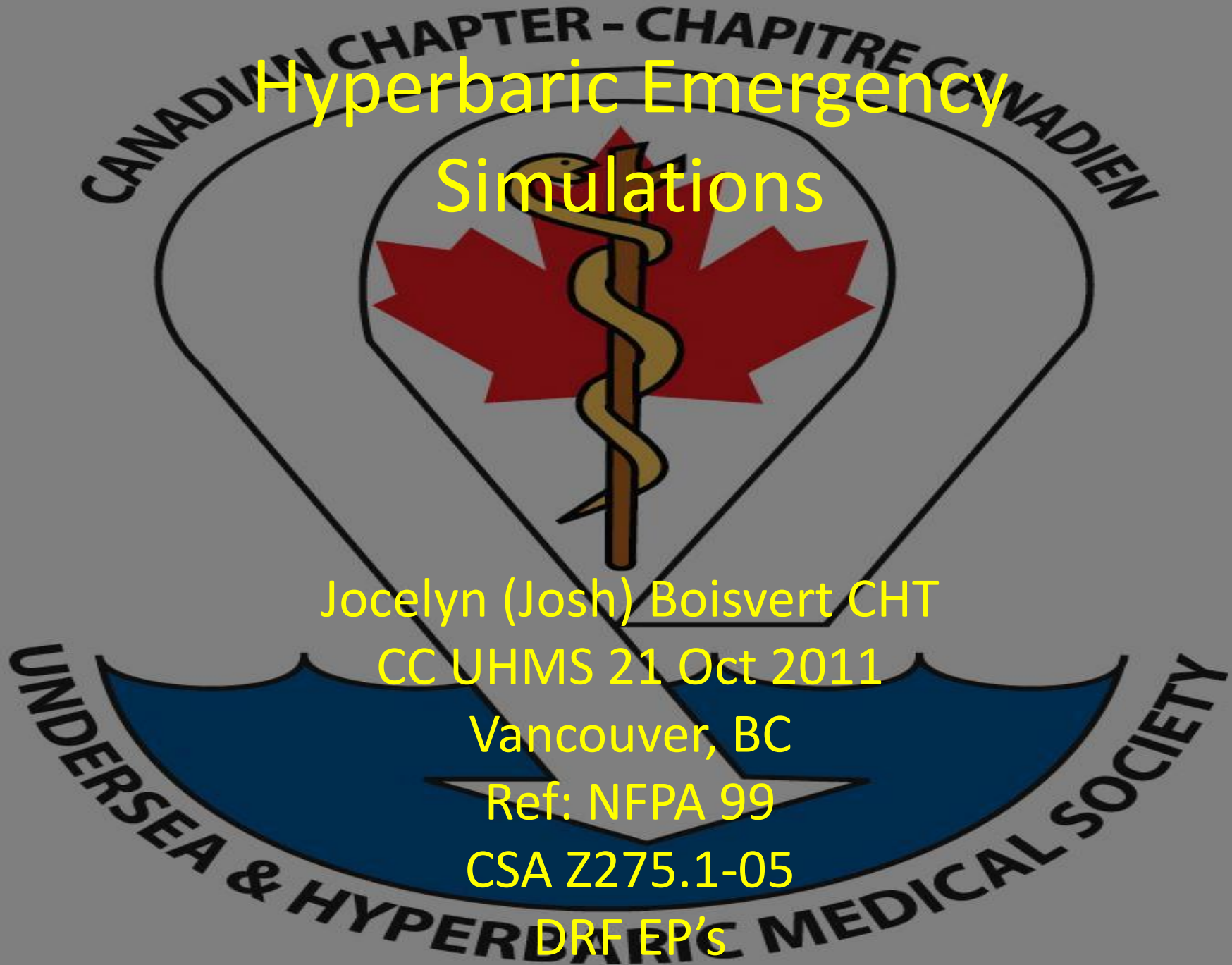
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CSA Z275.1-05

DRF EP's





Before



After

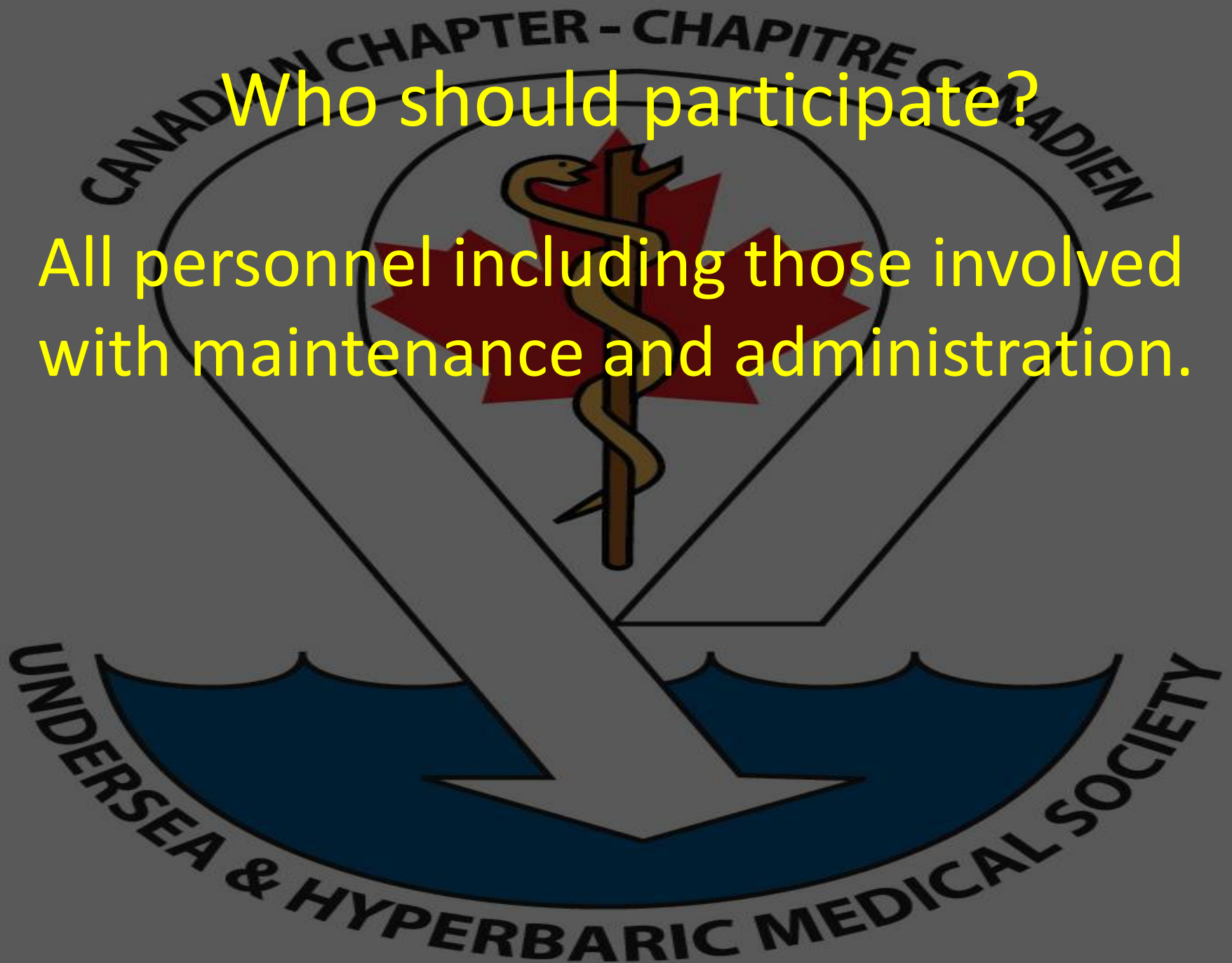


Emergency simulations

- Helps you to control and stabilize the emergency situation.
- Ensures proper action is taken during emergencies. (judgement, identifying emergency equipment, protect the patient and staff, prevent the situation from becoming worse).
- Reduce the delay in the reaction time (second nature).
- Reduce the risk of possible injuries or death (patients and staff).
- Reduce the risk of possible damage to the equipment.
- Promotes quick recovery.
- Reduce the cost of repair or replacement.

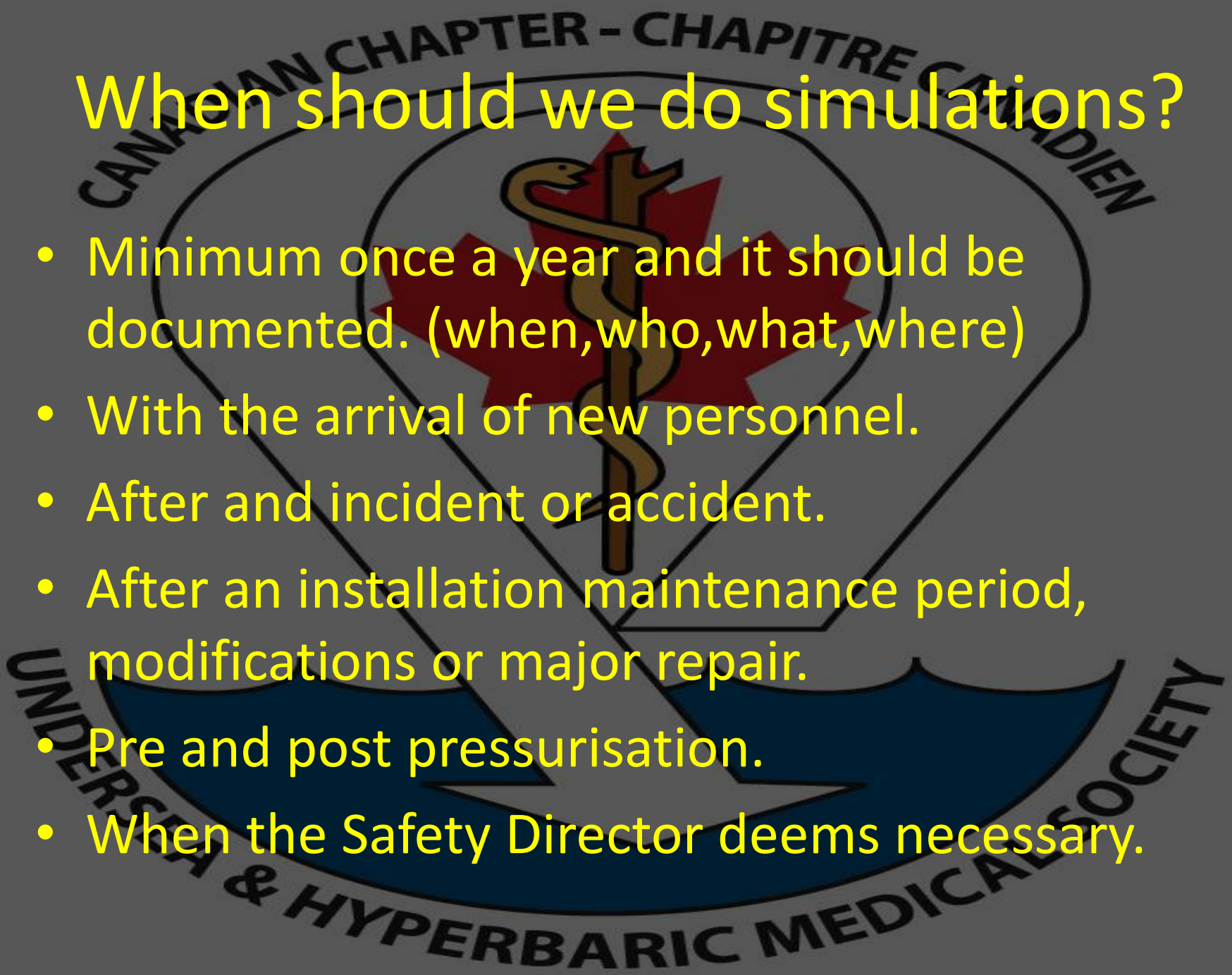
Who should participate?

All personnel including those involved with maintenance and administration.



When should we do simulations?

- Minimum once a year and it should be documented. (when, who, what, where)
- With the arrival of new personnel.
- After an incident or accident.
- After an installation maintenance period, modifications or major repair.
- Pre and post pressurisation.
- When the Safety Director deems necessary.



What kind of simulation

- As realistic as possible. (Shams)
- Video.
- Reading material (emergency procedures).
- Posters.
- OJT (teach and demonstrate).
- Meetings with your team and ask for their input.

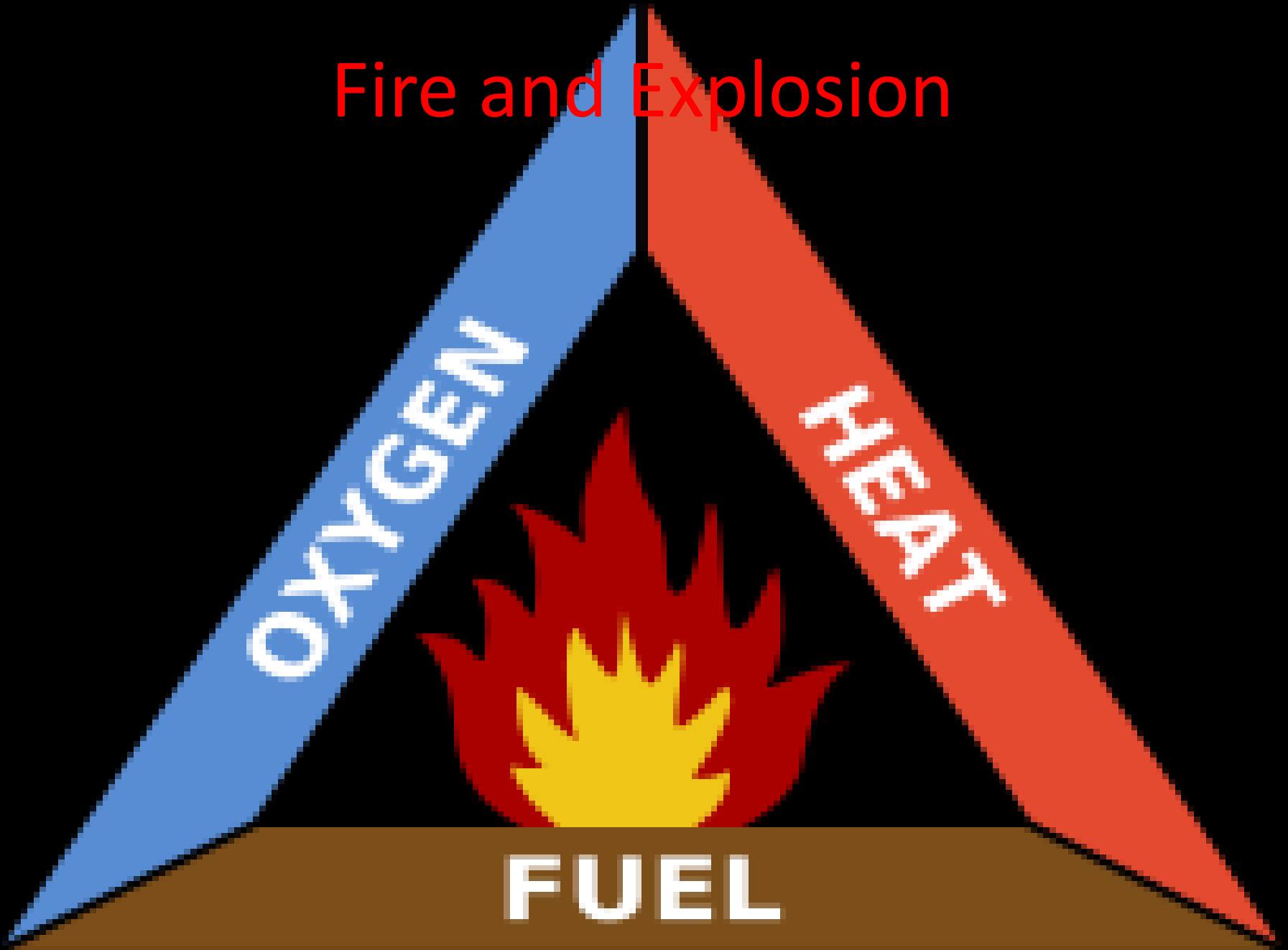
CANADIAN CHAPTER - CHAPITRE CANADIEN
UNDERSEA & HYPERBARIC MEDICAL SOCIETY

Potential Hazards



- Fire and Explosion
- Mechanical Hazards
- Physiological and Medical Hazards

Fire and Explosion



Fire and Explosion

OXYGEN

- 23.5 % to 24% O₂ level in Multiplace Facility (Flammability of material increases as the partial pressure of oxygen increase).
- 100% O₂ level in Monoplace chamber.



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Fire and Explosion

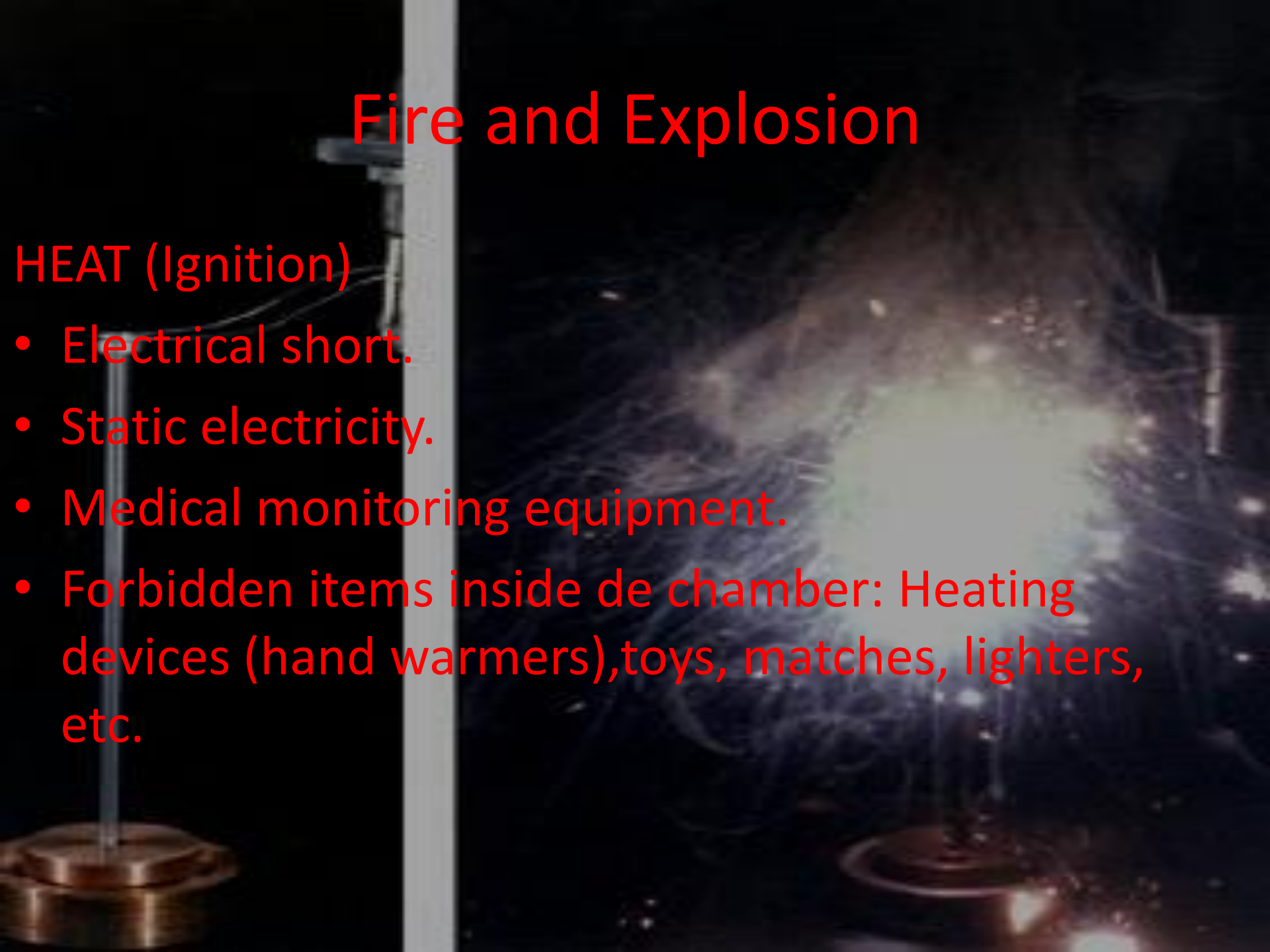
FUEL

- Material that do not burn in the air at atmospheric pressure will burn vigorously in an enriched O2 environment at a high partial pressure.
- Garments (patient and attendant).
- Wound dressing.
- Magazines (multiplace facility only).
- Towels and blankets.

Fire and Explosion

HEAT (Ignition)

- Electrical short.
- Static electricity.
- Medical monitoring equipment.
- Forbidden items inside de chamber: Heating devices (hand warmers), toys, matches, lighters, etc.



Mechanical Hazards

- Equipment failure or malfunction (valves, regulators, gauges).
- High or low pressure leaks.
- Chamber control failure or malfunction (press and depress).
- Chamber sub systems failure or malfunction (BIBS, comms, lighting, monitoring, computer, electricity).
- Chamber seals (doors, medical locks, viewports)
- Gases (air, O₂, mixed gas).

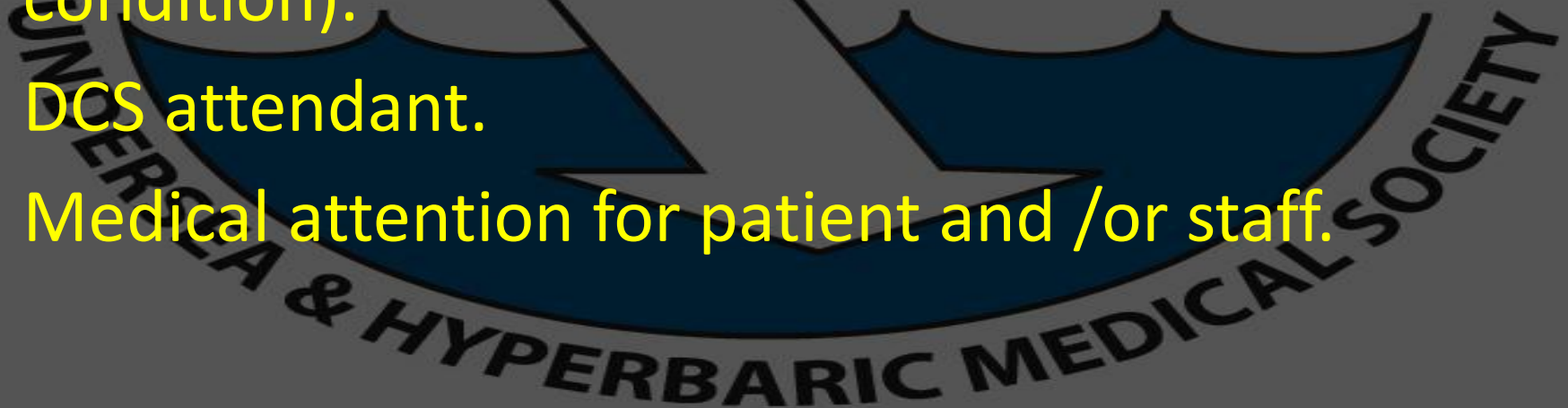
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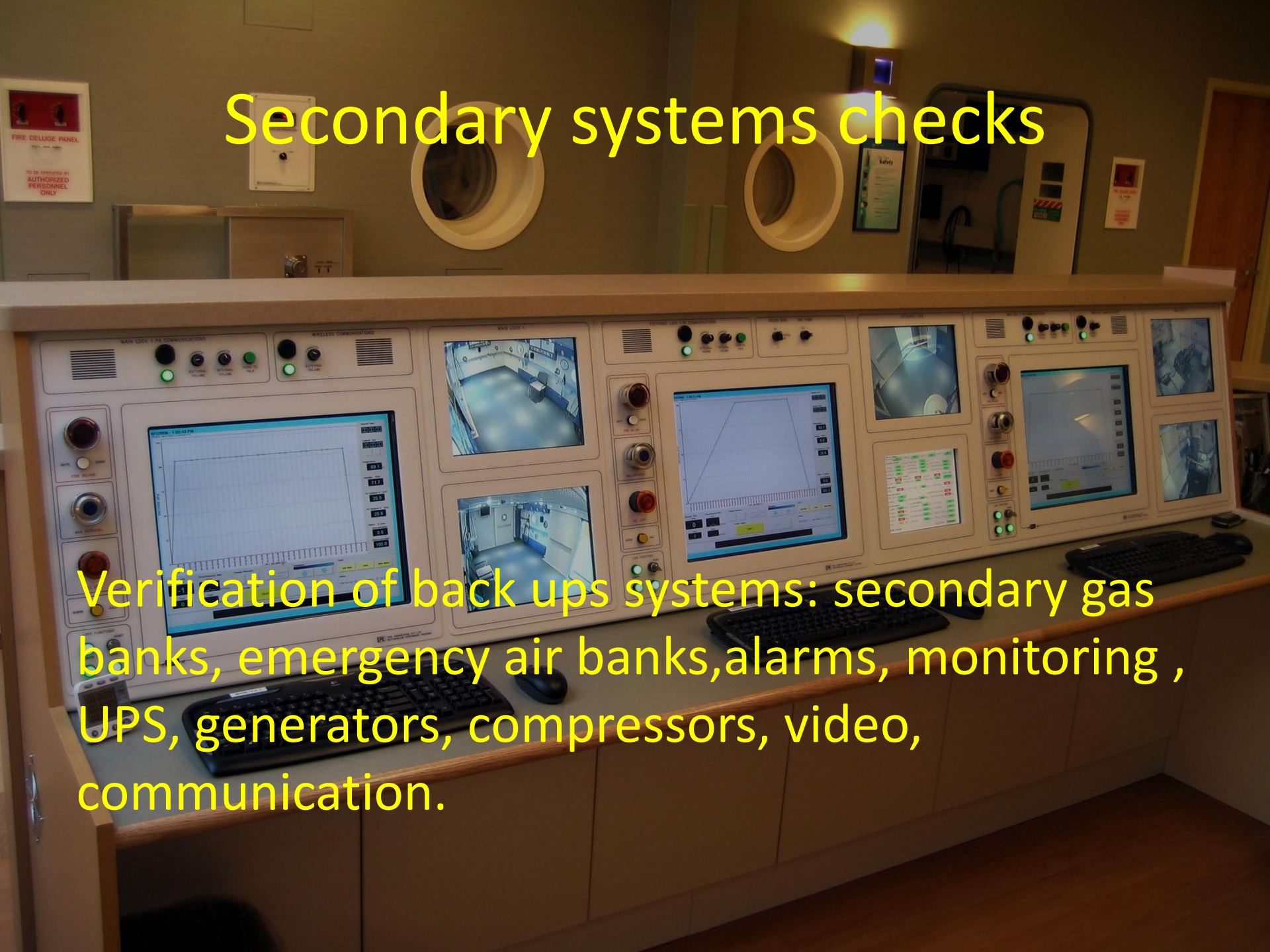
Physiological and Medical Hazards

- Chamber atmosphere contaminants (CO₂, CO, odors).
- Smoke, heat and toxic gases from a fire.
- Medical problems patient (Heart attack, syncope, O₂ toxicity, anxiety attack, diabetes, medical condition).
- DCS attendant.
- Medical attention for patient and /or staff.



Secondary systems checks

Verification of back ups systems: secondary gas banks, emergency air banks, alarms, monitoring, UPS, generators, compressors, video, communication.



Emergency procedures

The background image shows the interior of a hyperbaric chamber. A large, curved control panel is visible, featuring numerous gauges, dials, and digital displays. Several individuals are seated at the control console, appearing to be monitoring the chamber's operations. The lighting is dim, with a blueish tint, and the overall atmosphere is technical and focused.

Any member of the team can declare an emergency. Every member of the team shall have their specific emergency actions.

The Safety Director, Dive Supervisor, Controller, Operator, Certified Hyperbaric Technician shall take charge of the situation and act accordingly.

Emergency procedures

- Fire, Bomb Threat, in the vicinity of the chamber. and fire inside the chamber.
- Uncontrolled lost of pressure.
- Uncontrolled increase of pressure.
- Main air or oxygen supply failure.
- BIBS failure.
- Chamber contamination (CO, CO₂, odors).
- Lost of electrical power.
- Emergency decompression.

Emergency Decompression

Monoplace

- Know how to decompress your patient safely.
- Stat emergency team on site.

Note high O₂ % around the chamber (defib away)

Multiplace

- Know how to safely bring your attendant(s) and patient to the surface (decompression obligations).
- Look at your options (Sur D, in water O₂, TT5, TT6).
- Use the entry lock (lock patient out with another attendant).
- Stat Emergency team on site.

Near misses

- A **near miss** is an unplanned event that did not result in injury, illness, or damage – but had the potential to do so.
- They should be a «lesson learned» and reported in order to improve or revise your emergency procedures and/or protocols.
- Encourage the participation of your staff to report near misses.
- Encourage their participation to come up with solutions to prevent them.

Conclusion

The emergency simulation drills are essential and shall be revised and practiced as often as possible. Your team shall be able to identify, correct and stabilise the situation quickly. The safety of your patients and staff is paramount.