- **factors that lead to fire on board an aircraft**

Fire may originate from any source. A running aircraft has plenty of hot components that can overheat and ignite. Electrical system, including wiring, lighting, de-icing, radios, is a major source of ignition. Short circuit can make wiring smoke and result in fire. Every element of aircraft systems, as well as leaking avgas or dripping fluid from brakes, can start to burn from a single spark. The engine can catch fire due to bird or debris ingestion. Occasionally lightning strike can produce fire on board. Dangerous goods may also contribute to fire.

- **situation development in case of fire**

Fire is the most dangerous in-flight emergency and the worst pilot's nightmare. Scenarios depend on the stage of flight, the location of fire (onboard fire or engine fire or hidden fire) and the extent of the problem (open fire or just an indication). Although in flight fires resulting in aircraft loss are relatively rare, they are always significant issues with operational consequences. Smoke or fire-related events can also result in declared emergencies, airplane evacuations and extensive unplanned maintenance following abnormal procedures. In the worst-case scenario ditching or off the field landing may become necessary.

- **dangers posed by fire on board**

The fire may well affect aircraft systems. As a consequence, data link equipment, transponders, and even radios may stop to function correctly or be switched off and the pilots might see simultaneous indications such as multiple system failures and circuit breakers tripping in quick succession. Reduced cockpit visibility, communication difficulties and partial or complete flight control loss could also be expected.

- **pilots' requests and actions in case of a fire emergency**

In the event of in-flight fire pilots will follow emergency procedures. They will initiate an immediate descent to land the aircraft as soon as possible. They declare an emergency and request priority for handling. The crew can start an emergency descent even without a report to ATC.

At the first indication or suspicion of smoke or fire on aircraft, the flight crew will don oxygen masks to prevent incapacitation. It can make the voice messages more difficult to understand. Also they will try to identify the origin and location of fire or smoke and isolate it. If smoke is detected or suspected, an unscheduled or precautionary landing will follow.

In case of open fire pilots activate emergency equipment to contain spread of fire and put it out. They will fight fire using manual extinguishers and airborne anti-fire systems. Even when fire is extinguished, the crew are forced to land as soon as possible so that the fire cannot break out again.

In case of wrong fire or smoke indication, pilots still have to land as a precaution to avoid potential risks.

- **effect of a fire emergency on ATC operations**

Definitely this situation is stressful for both dispatchers and pilots. This will increase the burden on the dispatcher, as he must not only provide maximum support to the emergency aircraft, but also ensure the safety of other aircraft in the area.

· effect of a fire emergency on aerodrome operations

The airport emergency services and all related parties must be informed about aircraft situation, position, post landing intentions, presence of dangerous goods on board, people on board and fuel remaining. It is critical that emergency response equipment and personnel arrive at the scene within the minimum possible time and bring the fire under control if at all possible.

· services alerted in case of a fire emergency

Controllers will have to alert fire and rescue services, ambulance and technical vehicles.

· controller's actions in case of a fire report

Air traffic controllers should consider stress, strain and time pressure which the pilots experience under the circumstances. Controllers should follow ASSIST code.

• provide pilots with navigational and informational assistance
• inform all concerned: adjacent units, authorities, appropriate services
• clear the airspace for the emergency traffic
• ensure priority descent and landing at the nearest available aerodrome

· difference between an emergency evacuation and a normal disembarkation

After an emergency landing of a burning plane the passengers and crew are evacuated via emergency exits and emergency slides (chutes) without any delay.

During normal disembarkation, the usual exits of the aircraft will be used. Any vehicles such as ladders and buses are used. You can pick up your luggage. There is no time limit.

· effective ways of preventing fire on board an aircraft in the future

It is highly likely that in-flight fire and smoke-related events will continue to occur in the future, but professional maintenance, careful preflight inspection and regular fire drills may reduce the probability and severity of in-flight fires.

· situation connected with fire on board you have had / heard about

The major accident was in May 2019, when a Sukhoi Superjet belonging to national carrier Aeroflot crash-landed and burst into flames at Moscow's Sheremetyevo airport, killing 41 people.

The plane, bound for the Arctic city of Murmansk, turned around after being struck by lightning, bounced on the runway on landing and caught fire.

Why is fire on board one of the most dangerous situations?

Fire is the most dangerous in-flight emergency and theworst pilot's nightmare. Fire can spread quickly, fill the aircraft, produce gas and toxic fumes. People can get intoxicated due smoke inhalation.

What types of fire do you know?

Engine fire.

Engine fire is normally detected and contained satisfactory by the aircraft fire detection and suppression systems. But there are such situations when fire can not be determined by onboard systems and it can spread to the wing and the fuselage .Even when engine fire was eliminated the crew need to land the aircraft as soon as possible so that the fire will not break out again.

Cabin fire.

Cabin fire can be easily detected and put out by usage of fire extinguishes. It is also advisable to perform landing as soon as possible in order to investigate the problem.

Hidden fire.

Hidden fire can be detected by onboard systems or by passengers noticing smoke or fume. It is very hazardous as smoke can fill up the cabin and can reduce visibility and lead to suffocation and choking.

What is in-flight fire?

In-flight fire is the one that occurs when the aircraft is airborne. It is actually one of the most dangerous situations that the flight crew might need to deal with. With no counteractions, it may lead to the loss of the aircraft and a fatal accident within a very short period of time.

What firefighting equipment is used on board?

At the first indication, or suspicion, of smoke and fumes, or fire within the aircraft the flight crew will don smoke goggles and oxygen masks.

Secondly, the crew will attempt to find the source of the smoke or fire and eliminate it.
Different emergency equipment may be used, such as smoke detectors, fire extinguishes, fire gloves, fire goggles, hoods, crash axe, emergency chutes for evacuation.

Can dangerous goods contribute to fire? To what extent?

The International Civil Aviation Organization defines Dangerous goods as “articles or substances which are capable of posing risk to health, safety, property and the environment. If the packaging of dangerous goods is damaged, it can lead to fire, explosion, poisoning, radiation exposure.