

BUSINESS RISK REPORT:

Airport Hangar

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1.0 - Introduction

In order to ensure adequate health and safety standards and aspects of risk within the work place, construction sites or any location with the threat of injury or harm, even financially, it is important to carry out risk assessments of all potential threats to employees, business or the public. The following report will assess the risks which could occur within an Airport Hangar and how to eliminate or control the risks associated at the Hangar. The report will consider and acknowledge many potential risks, however will focus on five areas to complete a risk assessment. A crucial aspect to cover within the report will be the current legislation, which will be highlighted in section 1.2 - Legislation and mentioned throughout. Physical threats will not only be assessed within the report, however it is assumed that the risk assessments are being carried out post Covid-19, Brexit and US elections, resulting in these issues not posing as a threat to the Hangar.

1.1 - Health and Safety in the Work Place

Health and safety, risk assessment and management is in place by law to protect the public and employees from injury or harm. According to the Health and Safety Executive, *"Under the Management of Health and Safety at Work Regulations 1999, the minimum you must do is: identify what could cause injury or illness in your business (hazards), decide how likely it is that someone could be harmed and how seriously (the risk), take action to eliminate the hazard, or if this isn't possible, control the risk"* (Health and Safety Executive, 2021). Health and safety work place regulations and legislation are to prevent injury and accidents, as well as in public environments. These regulations and legislation are regulated by agencies such as the Health and Safety Executive (HSE). The HSE enforces health and safety within the work place, as well as enforcing regulations and employee welfare. *"The fundamental principle of health and safety law is that those who create risks are best placed to control them. We take into account the impact on the economy, by ensuring any action we take is proportionate, targeted, consistent, transparent and accountable."* (HSE, 2021).

1.2 - Legislation, Criminal and Civil Law

Within the workplace, civil and criminal law apply to issues when regulations or laws are broken. Usually this would be against the employer if preventions are not taken to protect employees or the public. *"Health and safety law is mostly enforced by the Health and Safety Executive (HSE) or the local authority. Responsibility for enforcement depends on the type of workplace. If you do not comply with a regulation relevant to your work, you'll normally be committing a criminal offence and could: get verbal or written advice, get an improvement or prohibition notice, be prosecuted. If HSE have to help you put things right, you'll need to pay for their time. This is called a 'fee for intervention' (FFI)."* (HSE, 2021). The Health and Safety Executive or Local Authority could take action under criminal law against an employer.

In regards to civil law, the person who has been affected would take action and claim for compensation. This would usually be for negligence and the outcome would be for financial compensation for the damages caused. *"Under civil law, if someone has been injured or made ill through your negligence as an employer, they may be able to make a compensation claim against you. You can also be found liable if someone who works for you has been negligent and caused harm to someone else. This is not the same as a conviction under criminal law."* (HSE, 2021).

A major piece of health and safety law is the Health and Safety at Work Act 1974. This act ensures the welfare, health and safety of people at work and protecting the public from risks in connection to the activities in a work place. In addition to this, “controlling the keeping and use and preventing the unlawful acquisition, possession and use of dangerous substances, and for controlling certain emissions into the atmosphere; to make further provision with respect to the employment medical advisory service; to amend the law relating to building regulations” (GOV, 1974). The Health and Safety at Work Act 1974 has been updated to reference and apply to relevant standards, new regulations, technology, materials and use of chemicals etc.

2.0 - Risk

Risk is the chance that a situation, item or scenario will harm or danger a person. This could be from exposure to hazardous items, danger of falling, fire risk and an endless list of others. Not only physical situations, risk could also financial and business related. *“Risk is essentially made up of three components, these being: Threats or Opportunities, Risk Events, Risk Impacts”* (Shuttleworth, 2017). In order to understand the risks, it is important to identify the threat and impact it can make on a person or business. This is where a risk assessment is completed to establish the level of threat, severity and likelihood of the risk occurring.

2.2 - Risk Assessment and Management

According to Healthy Working Lives *“A risk assessment is a systematic method of looking at work activities, considering what could go wrong, and deciding on suitable control measures. These control measures are designed to eliminate, reduce or minimize the risks of loss, damage or injury in the workplace.”* (Healthy Working Lives, 2020). Completing risk assessments is a legal requirement; if you employ five or more employees these assessments must be recorded. This would be completed by the employer or a competent person.

To completed a risk assessment, the first stage would be to identify the hazards or items which could cause harm. It is important to identify the hazards ti human health, including chemicals, fumes, working at height or even stress. The Health and Safety Executive advises to *“Look back at your accident and ill health records as these can help you identify less obvious hazards. Take account of non-routine operations, such as maintenance, cleaning or changes in production cycles.”* (HSE, 2021). Another aspect of identification would be to establish hazards to vulnerable workers. Vulnerable workers could be classed as pregnant women, disabled people or young workers. An example can be machinery risk for a young workers who may not be of age to operate it.

The next step would be to assess the risk. This would include the likelihood of the risk injuring or harming someone, as well as the severity of the injury. The assessment would also include who could be harmed, what actions are being taken to eliminate or decrease the risk and what, if anything, needs to be done to control the risk. A classification of the risk should be undertaken to understand the potential effect, severity and threat. This will be undertaken within the risk assessments in this report.

Once the risks have been controlled and assessed, there may be further controls to implement. *“Put the controls you have identified in place. You're not expected to eliminate*

all risks but you need to do everything 'reasonably practicable' to protect people from harm. This means balancing the level of risk against the measures needed to control the real risk in terms of money, time or trouble.” (HSE, 2021). An example of further control of a risk would be personal protective equipment (PPE) and ensuring that employees make use of it, as well as implementing practical safety measures and to ensure safe practice.

After recording the risk assessment, a review must take place to ensure the implementations are working and are effective for the business and employees. This can also include reviewing any changes within the business such as employees, change of equipment, chemicals or other processes.

2.3 - Risk Within the Workplace

To complete the initial phase in any working environment risk assessment, the hazards should be recognised in the working environment. Each working environment has hazards and despite the fact that there will be a selected individual for assessing this, it is everybody's obligation to be aware of dangers in the work environment and limit hazard and risk to yourself. Not all dangers are quickly identified and they will be specific to your working environment. This can make it hard to quickly recognise and protect employees.

The most common hazards or risks are chemical, psychological, physical safety and biological. Chemical risks are unsafe substances that can cause harm. These risks can bring about both wellbeing and physical damage, for example, skin irritation, respiratory aggravation, visual impairment, erosion or explosions. Psychosocial risk to employees can damage a persons emotional wellness. For instance, inappropriate behaviour, exploitation, stress and working environment brutality. Physical safety risks are factors such as working from height, radiation and noise. Biological risks include bacteria, vermin, dust or viruses which can have extreme effects to a persons health.

3.0 - Aircraft Hangar

An Aircraft Hangar is a building which is used to store or hold aircraft. The hangars are to provide protection from the elements, shelter for maintenance or storage. There is regulation for hangars, but this is dependent on what country the hangar is located. The regulations will include legislation for fire protection and activities which are permitted to be carried out at the hangar. Within the UK, aircraft hangars are usually constructed from steel, which for the employer/customer, are quickly constructed and have low maintenance costs.

3.1 - Risk Within an Aircraft Hangar

Harbison, who specialises in commercial aviation, defence and aerospace, says *“Every year, the UK Health and Safety Executive (HSE) receives reports of workers in the aviation industry injuring themselves after falling from a height, with many incidents occurring during aircraft maintenance when entering or exiting the aircraft and working on or from service equipment”, “The hazards and risks involved in aviation maintenance work is often similar to those found in construction, however, the non-linear shape of aircraft and intricate maintenance tasks employed by technicians to avoid damaging the surface or structure of the aircraft pose additional risks to safety. Working at height is an issue that needs to be taken seriously”* (Harbison, 2020). Due to the risk within hangars, as well as

the significance of injuries, this is also a risk to businesses as a result from employee injury. This can be a fine from a civil case against the business if working at height regulations are potentially breached. Harbison mentions an example at Luton Airport where Swissport was fined over £500,000 for breaching these regulations. *“The team leader was climbing a ladder when his foot slipped and he fell backwards to the ground, suffering an impact injury to his right foot. The court heard that Swissport had failed to ensure that work at height on high-loaders was properly planned, appropriately supervised or carried out in a safe manner.”* (Harbison, 2020).

3.2 - Considerations

For the report it is important to consider multiple risks which can be seen at an aircraft hangar, and to highlight the possible repercussions which could be seen if an employee was unlucky so suffer from the examples below. It is to be noted that there would be many other risks which could be identified, however for the purpose of the report, the author has identified what is believed to be the more significant and obvious risks. In section 4.0 - Risk Assessments, the author will additionally complete five risk assessments to evaluate the risks, their significance, likelihood, injury severity and how to overcome and reduce the risks.

3.2.1 - Noise

Due to the nature of an aircraft hangar, noise will be a significant risk for employees or the public. Aircrafts are extremely loud machines and without the correct personal protective equipment, the noise could cause physical issues to a person's hearing and cause damage to the ear drum. *“Purdue University researchers measured that the sound from a jet taking off at 25 metres away is 150 dB – a sound capable of rupturing an eardrum. A jet takeoff at 305 metres had a significantly lower sound level at 100 dB, but was still said to have the potential to cause serious hearing damage when exposed to it for an 8-hour period, which is common for baggage handlers and runway workers”* (Smedje et.al, 2011).

3.2.2 - Fuelling and Defueling

Fuel is a toxic and flammable substance. By fuelling and defuelling the aircraft, an employee is at risk of inhaling fuel, getting in to contact to skin, as well as being a significant fire hazard.

3.2.3 - Passenger Logistics

It is important to ensure if there are any passengers to ensure risks of tripping, dust or fumes are not present at the hangar. This could be detrimental to a business as passengers are not given personal protective equipment when catching a flight. It would be apart of the risk assessment if a passenger could get in to contact with hazardous items, which the result of the assessment would ensure the off-loading of passengers is completed away from the hangar or where is appropriate.

3.2.4 - Fire

With the toxic fumes, fuel and other flammable hazardous equipment present at a hangar, fire is a significant risk. A small spark in the wrong place could result in an explosion, death and completely burning down the hangar and aircraft. Fire extinguishers, sprinklers or an aircraft hangar fire suppression system would be utilised to put out the fire. *“Safely*

housing aircraft in hangars poses some unique challenges. These high-value assets contain flammable fuel and are often in close proximity to ignition sources so the potential for fuel spill fires is very real. To address this issue, many hangars have foam fire suppression systems. In fact, they can be compulsory as set forth by National Fire Protection Association (NFPA) codes depending upon the type of hangar and associated activity within it.” (Aviation Safety, 2019).



Image 1 - Aviation Safety, 2019

3.2.5 - Waste Disposal

Waste disposal would be a significant biological risk for employees. This would be due to the faeces, urine and rubbish from the aircraft. This could cause viruses, bacteria and potential attraction of vermin, animals and insects to the hangar, resulting in environmental issues.

3.2.6 - Toxic Fumes and Chemicals

There are many toxic fumes and chemicals used when running an aircraft. Examples of this will include Methyl Ethyl Ketone, used within paint and primers. According to the European Risk Observatory Report *“paint and primer thinners – cause 80% of occupational skin diseases. The right, chemical-resistant gloves help protect the skin.”* (European Risk Observatory Report, 2008). The report also mentions *“The biggest hazard in a hangar: airborne chemicals (such as Benzene) and mist from spray applications. Exposure to such VOCs, which evaporate much faster than water, can cause headaches, nausea, liver and kidney damage”* (European Risk Observatory Report, 2008). Many of these chemicals are also carcinogens and can enter the body via liquid splashes, therefore the correct overalls and protection must be worn by technicians and employees within the hangar. This will also assist with protecting from volatile organic compounds, *“Certain chemicals, such as toluene, have been linked to brain damage. Exposure to their vapours should be avoided at all cost, if possible. Alternative dispensing methods (such as closed bucket systems) and application tools can massively reduce the amount of dangerous vapour in the air”* (European Risk Observatory Report, 2008).

3.2.7 - Electrical Hazards

Within the hangar there would be many electrical risks, from hand held tools, batteries or even aircraft malfunctions. This can be due to issues as simple as having too many items plugged in, fuse trips, which can cause burns, shock or electrocution. It is important that compulsory testing is carried out to ensure items are checked to help reduce the risks.

3.2.8 - Vehicles

Finally, hangars always require additional vehicles. Whether they be for transporting luggage, waste, passengers, food, cleaning materials or maintenance equipment, the vehicles are another issue which needs to be assessed. This will create risk with towing, ensuring brakes are secure and pedestrians or employees within the hangar. It is important to ensure that the correct high visual clothing is worn to be seen by moving vehicles, or the risk of being hit with a vehicle or even crushed would be significantly higher.

4.0 - Risk Assessments

4.1 - Risk Assessment 1 : Noise

What is the Risk?	Who and how could someone be harmed?	What action could be done to control the risk?	What are the possible injuries from the risk?	What is the severity of the risk?	Who should carry out the actions?	When should the action be done?
Noise within the workplace.	Employees, Injury to eardrums, hearing	Earmuffs with adequate db protection, training, PPE	Perforated eardrum, deafness, rupture	Very severe Unacceptable	Employee to wear and manager to enforce	ASAP

4.2 - Risk Assessment 2 : Fire

What is the Risk?	Who and how could someone be harmed?	What action could be done to control the risk?	What are the possible injuries from the risk?	What is the severity of the risk?	Who should carry out the actions?	When should the action be done?
Fire hazard	Employees within the hangar, surrounding environment and public	Fire suppression system, sprinklers, extinguishers , training	Burns, death, toxic fumes, smoke inhalation	Very severe Unacceptable Death	Employee to enforce and manager to oversee	ASAP

4.3 - Risk Assessment 3 : Working at Height

What is the Risk?	Who and how could someone be harmed?	What action could be done to control the risk?	What are the possible injuries from the risk?	What is the severity of the risk?	Who should carry out the actions?	When should the action be done?
Working at height	Employees falling from ladder, wings, scaffolding	Training, instructions, cages used on platforms, signage, PPE	Broken bones, back injury, injury from impact, death	Very severe Unacceptable Death	Employees to enforce and manager to oversee	ASAP

4.4 - Risk Assessment 4 : Toxic Fumes and Chemicals

What is the Risk?	Who and how could someone be harmed?	What action could be done to control the risk?	What are the possible injuries from the risk?	What is the severity of the risk?	Who should carry out the actions?	When should the action be done?
Toxic fumes and chemicals	Employees, manager, resulting in fire and affecting area.	Training, PPE, masks, goggles, overalls, supervision	Burns, cancer, skin irritation, radiation poisoning, boils, death	Very severe Unacceptable Death	Manager to oversee due to the severity	ASAP

4.5 - Risk Assessment 5 : Vehicles

What is the Risk?	Who and how could someone be harmed?	What action could be done to control the risk?	What are the possible injuries from the risk?	What is the severity of the risk?	Who should carry out the actions?	When should the action be done?
Vehicles	Employees, passengers, could be run over, crushed, vehicles crashing in to other vehicles	Training, high visibility clothing, PPE, signage, common sense	Death, broken bones, amputation, crushing, minor injuries	Severe Unacceptable	Employees	ASAP

5.0 - Conclusion

To conclude the report, the importance of undergoing risk assessments to ensure physical and workplace health and safety has been discussed. To be able to abide by legislation and regulations, risk assessments are required to understand the potential risks, injury and significance to a business. The report has discussed the issues which could occur in an aircraft hangar; the report not being able to discuss each single issues, but has highlighted many significant risks which would result in major injuries. Risk assessments are carried out for a persons safety and to control or eliminate risks to the employees, avoiding warnings or fines from the Health and Safety Executive, or even a civil or criminal case. The aim is to ensure safety and allowing people to work without risks, or for them to be well instructed, correctly trained and protected from risks which can not be completely eradicated.

6.0 - References

- Aviation Safety, 2019, Pros and Cons of Hangar Foam Fire Suppression Systems, <https://www.global-aero.com/pros-and-cons-of-hangar-foam-fire-suppression-systems/> [Last Visited 24/04/21].
- European Risk Observatory Report, 2008, Hangar Hazards, [https://www.kcprofessional.co.uk/media/124992844/Hanger Hazards infographic.pdf](https://www.kcprofessional.co.uk/media/124992844/Hanger_Hazards_infographic.pdf) [Last visited 25/04/21].
- Health and Safety at Work etc. Act, 1974, 1974 Chapter 37, <https://www.legislation.gov.uk/ukpga/1974/37/introduction> [Last visited 22/04/21].
- Health and Safety Executive, 2021, Health and safety at work: criminal and civil law, <https://www.hse.gov.uk/simple-health-safety/law/health-safety-law.htm> [Last Visited 22/04/21].
- Health and Safety Executive, 2021, Managing risks and risk assessment at work, <https://www.hse.gov.uk/simple-health-safety/law/index.htm> [Last Visited 22/04/21].
- Ian Harbison, 2020, Aircraft Hangar: Key tips to ensure technicians' safety, <https://www.aviationbusinessnews.com/mro/aircraft-hangar-safety-tips/> {Last Visited 23/04/21].
- Mike Shuttleworth, 2017, Describing Risk: Accurate Description = Better Management, www.project-risk-manager.com/blog/describing-risk/ [Last Visited 22/04/21].
- Smedje et.al, 2011, ARE AVIATION WORKERS LOSING THEIR HEARING?, <https://uk.widex.pro/en-gb/care-counselling/people-hearing/aviation-workers-losing-hearing> [Last Visited 23/04/21].