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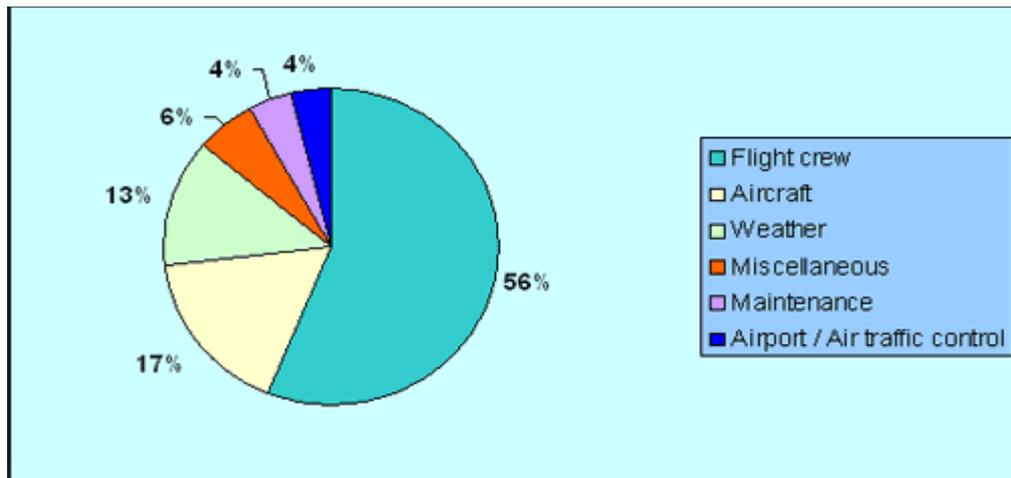
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## Keflavik Airport (KEF) Safety and Air Navigation Services

### **Introduction**

With increased case of plane crashes, hijacks, and terror groups, safety within the airport has become an important factor. Keflavik Airport (KEF) thrives through offering safe and reliable transport. The airport has the Air Navigation Services and Aerodromes Unit that plays important roles in planning and coordinating different actions designed for achieving the objectives of Air Traffic Management in an efficient and safe manner, monitoring and implementing different actions associated with the air navigation standards, monitoring and assessing international aerodrome safety development, and providing guidelines, operating standards, and issuing different permissions related to safety of the airport. KEF leverages on navigation services and aerodromes to minimize the risks of accident, events, and any other incidents which could decrease safety. In essence, airport policy places flight safety and security above other matters posing challenges within the industry. The KEF Airport has enhanced flight safety and security aspects in order to meet the set regulations as well as the Icelandic and international ideals (Keflavík International Airport 4). Through the years, the airport has minimized all operational risks at the aerodrome to acceptable levels and aircraft risks occurring on the neighbouring area of the aerodrome. Some of the causes of air crash are represented graphically in figure 1 on the next page. Ground handling services are important to ensure smooth operation of the airport, and, at the same time, it is the part that experiences some of the huge safety problems. At KEF, there are many ground handling services that are surrounded by safety issues.



*Figure 1: Causes of Air Crash*

### **Fuel Operations and Other Essential Fluids**

At the KEF Airport, there is ground handling operations team responsible to work across the airport in a bid to support a just cult, which encourage an open reporting of the incidents and accidents associated with poor fuel handling. The ground handling employees working with the fuel and other essential fluids utilize the Mandatory Occurrence Reporting (MOR) process developed through the Civil Aviation Authority (CAA). The airport uses MOR if there is significant spillage during fuelling operations, and in this case, CAA views significant spillage as that the airport is unable to contain or control through the spilling kits used by the ground service providers. In addition, MOR is applicable in an even loading of incorrect fuel quantities that could have substantial effects on the operations, structural strength or balance, endurance, and performance of the aircraft.

The ground handling operations team at KEF use MOR when loading contaminated, incorrect fuel type, or any essential fluid such as drinking water and oxygen. Fire safety standards for the fuelling operations need to be established to prevent fire occurrences during the fuelling operations (Abeyratne 112). Moreover, for fuel safety reasons, KEF has aircraft fuel servicing hydrant vehicles, which lack tanks. For the ground servicing of the aircraft, the safety measure at the airport include fire extinguishing equipment considered important for at

least initial intervention in the event the fuel fire occurs. The trained personnel also provide rescue and firefighting service should fire or major spill take place. KEF conducts fuelling inspection to comply with the airport safety standards and checking for fuelling agent compliant with the fire safety standards of the operator.

### **Aircraft Damaged and Unintended Contact**

The KEF Airport ensures that there is no equipment or vehicle obstructing the ramp while the aircraft pushes back or is packing. Ramp accidents occur in most airports due to poor management of contact between the airlines and various objects at the airport. Studies indicate that ramp accidents cost main airlines globally at least US\$10 billion annually, which affect the operations of the airports, lead to personal injuries, damage to the aircraft, facilities, and various ground supporting equipment (Keflavík International Airport 12). Figure 2 below summarises some of the major cause of accidents in airports.

ACI RAMP INCIDENT AND ACCIDENT DATA			
CAUSES OF INCIDENTS AND ACCIDENTS (I&A) (2007)			
Number of participating airports: 158			
Number of aircraft movements: 12,360,425			
Incidents and Accidents	Number	% Total	Rate
I&A involving aircraft	966	31.92	0.078
I&A involving equipment and property	2,060	68.08	0.167
Total	3,026	100.0	0.245
Incidents and Accidents Involving Aircraft			
Damage to stationary aircraft by equipment	725	75.05	0.059
Damage to moving aircraft	241	24.95	0.019
Total	966	100.0	0.078
Incidents and Accidents Involving Equipment and Property			
Caused by jet blast	27	1.31	0.002
Equipment to equipment damage	1,393	67.62	0.113
Equipment to property damage	640	31.07	0.052
Total	2,060	100.0	0.167
Injuries			
Fatal	1	0.21	0.000
Severe	60	12.68	0.005
Minor	412	87.10	0.033
Total	473	100.0	0.038

**Figure 2: Causes of Accidents in Airport**

In response to such accidents and damage, KEF Airport developed a Ground Accident Prevention (GAP) program to address issues associated with unauthorized and unintended contact with the aircrafts. On the other hand, the GAP program developed products and information in an “e-tool” for elimination of the incidents and accidents within the airport

ramps or aprons and the adjacent ways used by taxis and during the movement of the aircraft within the hangers. The airport has developed and deployed the rules and regulations associated with using the ramp (Transport Malta par. 3). In particular, it ensures that all airport users comply with the established standards like complying with speed limits, proper disposal of the hazardous wastes, wearing protective gears (Personal Protective Equipment), ensuring that passengers, equipment, and taxis avoid improper use of the runways. KEF Airport has also trained its employees to handle the presence of large number of people operating different equipment within the airport in the constrained area under pressure.

### **Ground Service Equipment**

Through its ground handling operations safety team, the airport is working to support the culture and encourage open reporting of the accidents and incidents. The airport uses MOR process to ensure smooth operation of the ground service equipment. There are procedures within the airport to assist should there be failure or malfunctioning of ground equipment that might endanger the aircraft including failure of the bars and ground power unit fires. The equipment is positioned or removed with the correct procedures (Landry and Ingola 94). KEF Airport has its ground support equipment at the ramp to support the operations of the aircraft such as ground power operations, passenger loading operations, and aircraft mobility.

To reduce the turnaround time at the KEF Airport, its ground service equipment focuses on efficiency, safety, accuracy, and speed. Small airlines operating within the airport have subcontracted such maintenance activities to larger and reputable carriers on short-term basis since it is a cheaper alternative compared to setting up an independent base of maintenance (Ek and Akselsson 62). Within the airport, there are airlines that have entered into Maintenance and Ground Service Agreement with one another and used by the airlines to assess the cost of maintain and supporting the aircraft. There are ground services at the airport related to services instead of actual flying of the aircraft including cabin services,

which ensure that passengers are safe and comfortable. Besides, KEF has diversified range of vehicles that offer services such as loading and offloading the cargo and carrying out different maintenance services.

### **Stand Conditions and Operating Environment**

KEF Airport, through its ground handling operations safety team, uses the CAA's MOR in the event that there is a failure or significant deterioration in the operating surfaces of the aerodrome, unsatisfactory airside environment or the ground de-icing, ramp conditions that could cause any hazardous condition for the airline, and the jet wash incident that could result in any significant damage or serious injury to the passengers. There are environmental issues associated with the operations of the airport: energy and water consumption, noise and vibrations, solid waste, air emissions, and hazardous material management (Federal Aviation Administration 3). Noise pollution is the main cause of noise disturbance. For instance, noise from automobiles on roads heading or leading to the airport are also other environmental aspects that remain of great concern. Due to the risks associated with the collision between the birds and the aircrafts, the airport has undertaken pollution control programs to frighten or shoot the birds. Globally, countries are concerned with environmental issues. As a result, KEF Airport has implemented environmental mechanisms to ensure pollution levels are minimized.

### **Personal Safety and Injury**

The ground handling operations safety team uses the CAA's MOR process to see if the people are endangered by the aircrafts. There are many operations within airport that can endanger the safety of people within the airport. Therefore, KEF Airport has safety management practices. Airlines are responsible to ensure the disabled and the elderly passengers are conveyed in various steps of their journey. The airport has developed a safety policy that emphasizes on the workers being critical resources within the company, which

makes prevention to their injury critical. Additionally, the airport has trained employees on various principles of ergonomics and proper handling of the materials. At the same time, the airport is in association with other air transport association to set up global standards accounting for various challenges associated with manual airline baggage handling (Grossman par. 4). In addition, the airport has developed and enforced occupational and health safety regulations.

The ground equipment and aircraft loading systems are maintained to the desired levels. However, the management needs to establish investigations to determine the contribution of various factors to injuries as well as establish rules and procedures that might assist in eliminating the risk of injuries. There are signs and cautions displayed to guide passengers and visitors using the airport to prevent injuries. Furthermore, through installed camera and scanning systems, the management is able to monitor the movement of people to prevent entry into risky areas without authorization.

### **Aircraft De-Icing and Anti-Icing**

KEF Airport's MOR contains guidelines on how aircraft de-icing on the ground should be carried out as well as how the issue should be handled in case of contamination or degradation of the de-icing fluid (Keflavík International Airport 6). Within KEF Airport, all the flight personnel and those involved in inspection of the aircraft and application of the ground de-icing receive frequent training on the subject and through the De/Anti-Icing Code, the airport ensures that there is communication at all time and records of treatment taken to prevent cases of misunderstanding. Airport operations ensure that chances of ice forming in the engine are minimal since such ingestion in the engine may damage it. In this dimension, various chemicals of fluids containing propylene glycol (PG) and other extracts, which can function at lower temperatures, are used in de-icing (Grossman par. 7). Failure to decontaminate an aircraft on the ground may make it lose control when it becomes airborne.

## **Proposals for Improvements**

In any airport, irrespective of the configuration size, safety practices are mandatory. KEF Airport needs to enhance its passenger screening technology by integrating them into long-range implementation plans to upgrade the airport security. The passengers should also be given smart credentials and provisions for integrating various intelligence agencies' data with information within the airport and database of the airline. The government, through the Department of Transport, needs to oversee the progress used to set the new standards for various security operations, background checks, and train various security personnel on ways of dealing with the rising cases of terrorism and plane hijacks (International Civil Aviation Organization 69). For the safety of the employee, they need to undergo a series of trainings before official delegation of the duties. Based on the available statistics, ramps are considered the most dangerous time zones. Therefore, the airport needs to have clear signs and posters directing the passengers, and, at the same time, having only trained and qualified employees accessing such areas. Moreover, the movement of vehicles within the airport need to be controlled to prevent noise pollutions and reduce environmental impacts associated with the airport.

## **Conclusion**

Based on the foregoing analysis, safety of passengers and workers is the most important factor within the airport. Inadequate safety and security measures have led to increased cases of terror activities, hijacks, and plane crashes. The treatise focused on safety and security management at Keflavik Airport (KEF), and noted that despite the airport having standardized security and environmental practices, it still needs to enhance its ground service equipment to guarantee efficiency, effectiveness, and reliability. Through its Air Navigation Services and Aerodromes Unit, the airport has been able to plan and coordinate various objectives as outlined in the Air Traffic Management.

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