

VOLCANIC ACTIVITY OF EARTH'S - NATURAL HAZARDS FOR WORLDWIDE AVIATION IN XXI CENTURY

Marek Zoladek

Pedagogical University of Cracow, Institute of Geography, Poland

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Currently, high technology development has reduced the risk in the event of natural disasters. However, some natural hazards still cause big problems for people and the world economy. In recent years we have seen the negative effects of natural volcanic activity for aviation. Since the first flight of the Wright brothers in 1903, aviation rapidly developed and are an important means of transport in different areas of the economy. Currently air travel are something normal and transportation cargo on board aircraft is the fastest way

to deliver loads over long distances. However, it is not always possible to use air transport. In addition to technical limitations, there are some natural handicaps for this type of transport. One of the most important volcanic areas are liable in the event of an eruption and entering a volcanic ash into the atmosphere threaten the safety of flight. It could easily reach the cruising altitude of typically 10 to 13 km. After the eruption of St. Helens volcanic reached a height of 31 km.



Photograph 1. North side of Mount St. Helens (2,549 m) in 2012.

Source: own photograph

The construction of modern aircraft causes that they are susceptible to damage during movement within the cloud of volcanic ash. They can cause damage to the plating, avionics components and above all lead to the stop of the engines. To prevent air space near volcanic areas is constantly monitored. If a threat flights are suspended until conditions improve. At the beginning of the second decade of the twentieth century reclosable this reason, the air space above include Japan, southern Alaska and Chile.

One of the most active volcanic areas of the globe is the territory of Indonesia where we can find 127 active volcanoes. Among them is one of the „Decade Volcanoes”, Mount Merapi. For this elite group of the International Association of Volcanology and Chemistry of the Earth’s Interior (IAVCEI) passed the 17 volcanoes located in various regions of the Earth, whose eruption can cause great damage to the world economy. Over the territory of Indonesia, run the main air corridors, linking the city to the area of Asian Australian and Oceania. Sky route daily traverse hundreds of aircraft for passenger and cargo carriers. With the increase in air traffic is growing threat from nature in the form of volcanic dust that gets into the air during a volcanic eruption. Scientists know that threat only after the incident airport, which took place on June 24, 1982 year. Passenger Boeing 747 British Airways (flight BA009) operating on the route London - Auckland fell into the range of volcanic ash after the

eruption of Galunggung. The crew unaware of risks and the presence of volcanic ash in the air began to observe a strange phenomenon taking place on the fuselage, nacelles and wing engines. There appeared mysterious lights, resembling flames of fires called St. Elma. All this is accompanied by exclusion of the four jet engines. Luckily managed to start the engines and land safely at Indonesian airport. Initially, the service airline and the auditors did not know the cause of the incident. Only after testing the researchers found that the cause was a volcanic ash cloud which was moving plane. History of Flight BA009 was used for writing one of the episodes of the series ‘Mayday’ (Season 4, Episode 2 “All engines failed!”, Cineflix Production). Currently, every day hundreds of aircraft defeated Indonesian airspace, which the individual zones are closed for increased volcanic activity.

Territory of the island nation located on the route of one of the busiest flight corridors between Europe and North America. Daily air route over Iceland overcomes several hundred planes filled with passengers and cargo load. Increased demand for flights causing traffic congestion along the route, and a large number of applications will use the largest airlines currently flying machines, such as the Airbus A380 “superjumbo” and Boeing 747 “jumbo”, entraining on your board up to 540 passengers. In the case of the use of one class of travel (economy class), A380 capacity increases to 853 passengers.

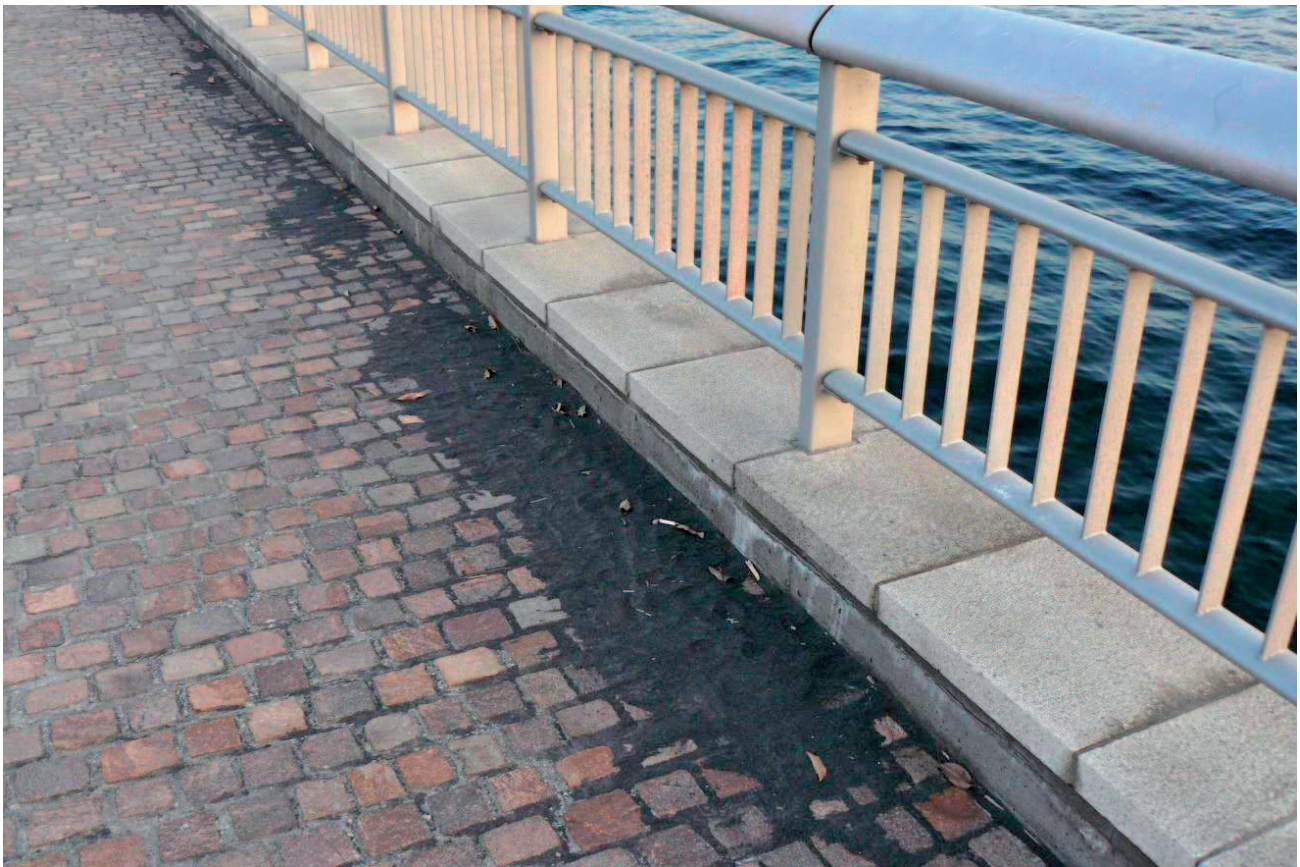


Photograph 2. “Superjumbo” Airbus A380, currently (August 2015) the biggest passenger aircraft.

Source: own photograph

However, by 2014, none of the airlines having in its fleet of this type of aircraft is not decided on the configuration of the passenger compartment. But few people out on board realizes what could threaten flight machine on the volcanically active area. Geological map of Iceland shows what her uniqueness. Located on the border of tectonic plates has about 130 volcanoes of which 18 were active from the year 874, that is, since the settlement of Iceland by man. In that year he reached the coast of the island of Norwegian Viking Ingolf Arnarson. This is one of the areas of the world where air transport is largely determined by the current situation of the volcanic. This is one of the areas of the world where air transport is largely determined by the current situation of the volcanic. One of the largest in the history of aviation ground in times of peace (September 11, 2001 after the terrorist attacks for security reasons was closed airspace over the United States and parts of the North American continent) occurred in April 2010. After a violent volcanic eruption of Eyjafjallajökull (1651 m) air space over most of Eu-

rope was closed for several days. This resulted in periodic retention of air transport in this part of the world. The huge chaos reigned for a few days after the re-opening of airspace. According to estimates by the International Air Transport Association (IATA), difficulties have affected nearly 10 million registered travelers and losses for the same carriers and the airline industry amounted to EUR 150 million. Was also temporarily closed the airspace of eastern Canada. Currently, one of the most dangerous volcanoes in Iceland is Hekla (1491 m), located just 115 km from the capital city - Reykjavik. In the immediate vicinity Hekla volcano runs one of the main flight corridors. With the modern scientists and air traffic controllers constantly monitor the area. In the event of a hazard zone limit available to the aircraft or changing the route of machines already in the air for safe and free from volcanic ash. The crew and passengers on flights running on Iceland can feel safe, but about a hazard recalls only view volcanic cones viewed from a height of several thousand meters.



Photograph 3. Volcanic ash from Sakurajima (1117 m) volcano on the Kagoshima's street (Japan) in 2011.

Source: own photograph

The rapid development of aviation in the late twentieth and early twenty-first century brought the density of air corridors. Air traffic has increased especially between the major population centers and major economic centers of the world. After opening the political world of the late twentieth century, the international corridors airlines run on almost all the countries of the world and the areas of the North Pole to the Equator. Un-

fortunately, many of them marked the volcanic areas, which are potentially hazardous to aviation. The current design of aircraft does not provide protection, so the only 100% safe method of flights in this area is to avoid this danger. Thanks to a sophisticated system of monitoring, air traffic controllers when detecting this threat modify routes or threatened areas close to any air traffic.

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Marek Zoladek

E-mail: herrmagen@poczta.fm

Adress: Pedagogical University of Cracow, Institute of Geography, ul. Podchorazych 2, 30–084 Krakow, Poland.
