North Atlantic Volcanic Threat

OPSGROUP Team
14 November, 2023

Key Points

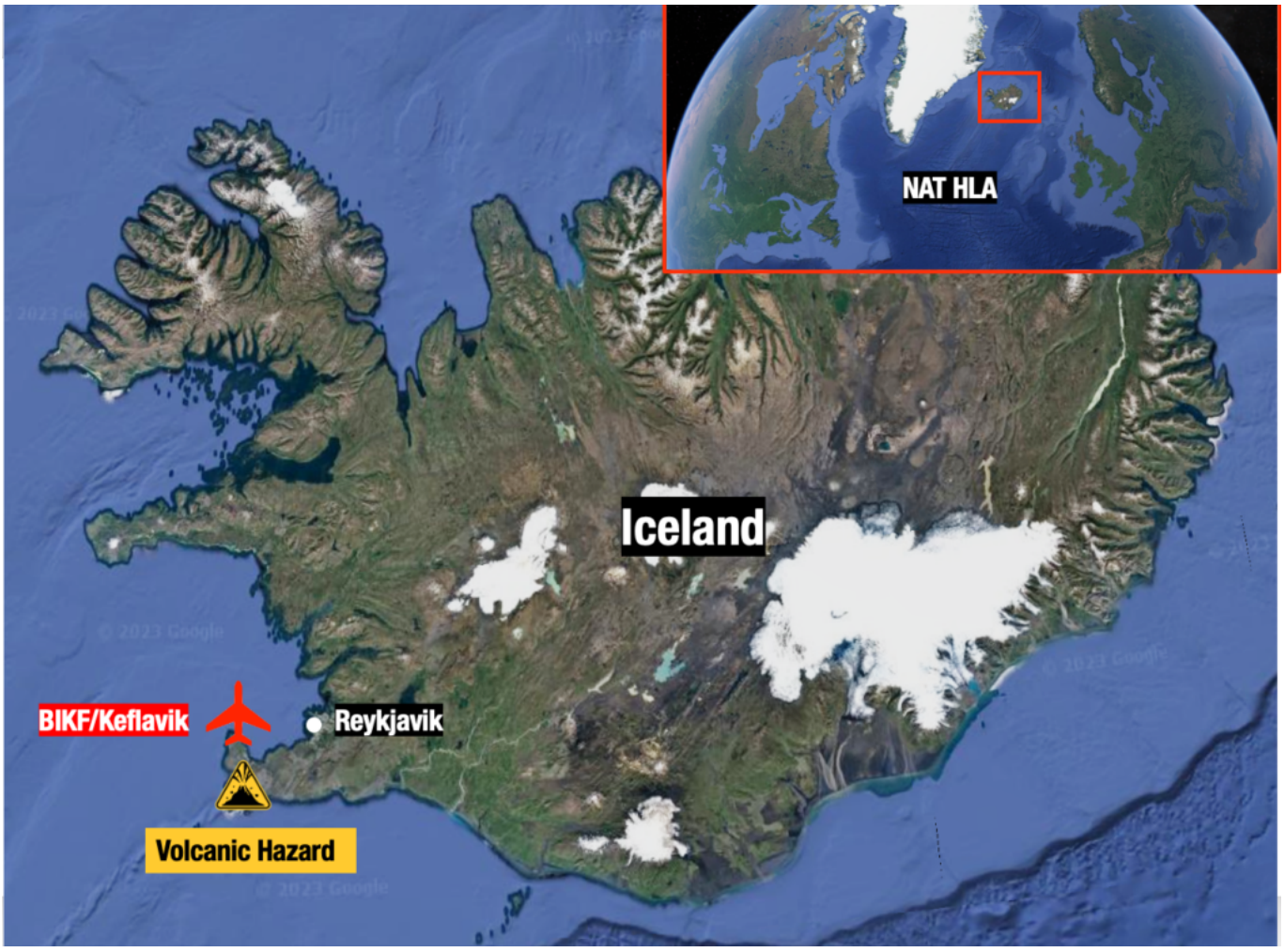
- **One of Iceland's volcanoes (10nm southwest of BIKF/Keflavik) is showing signs it's about to erupt.**
- **If it does, NAT crossing traffic is likely to be affected at short notice.**
- **ICAO have a Contingency Plan ready to go if it does erupt (PDF below).**
- **Pilots and Operators: There is a list of things to watch out for if you do fly through volcanic ash, and a recommended procedure to follow.**

Iceland is on high alert for an imminent eruption at one of the volcanoes on the Reykjanes Peninsula – a stone's throw southwest of Keflavik. If it does erupt, it has **potential to seriously impact North Atlantic traffic.**

The last time this happened in 2010, the (try pronouncing this one) Eyjafjallajökull volcano closed almost every country's airspace in Western Europe in the weeks that followed. **Nearly 100,000 commercial flights were grounded.**

One of the few flights not to be impacted by the volcanic ash in 2010.

Where are we talking about?



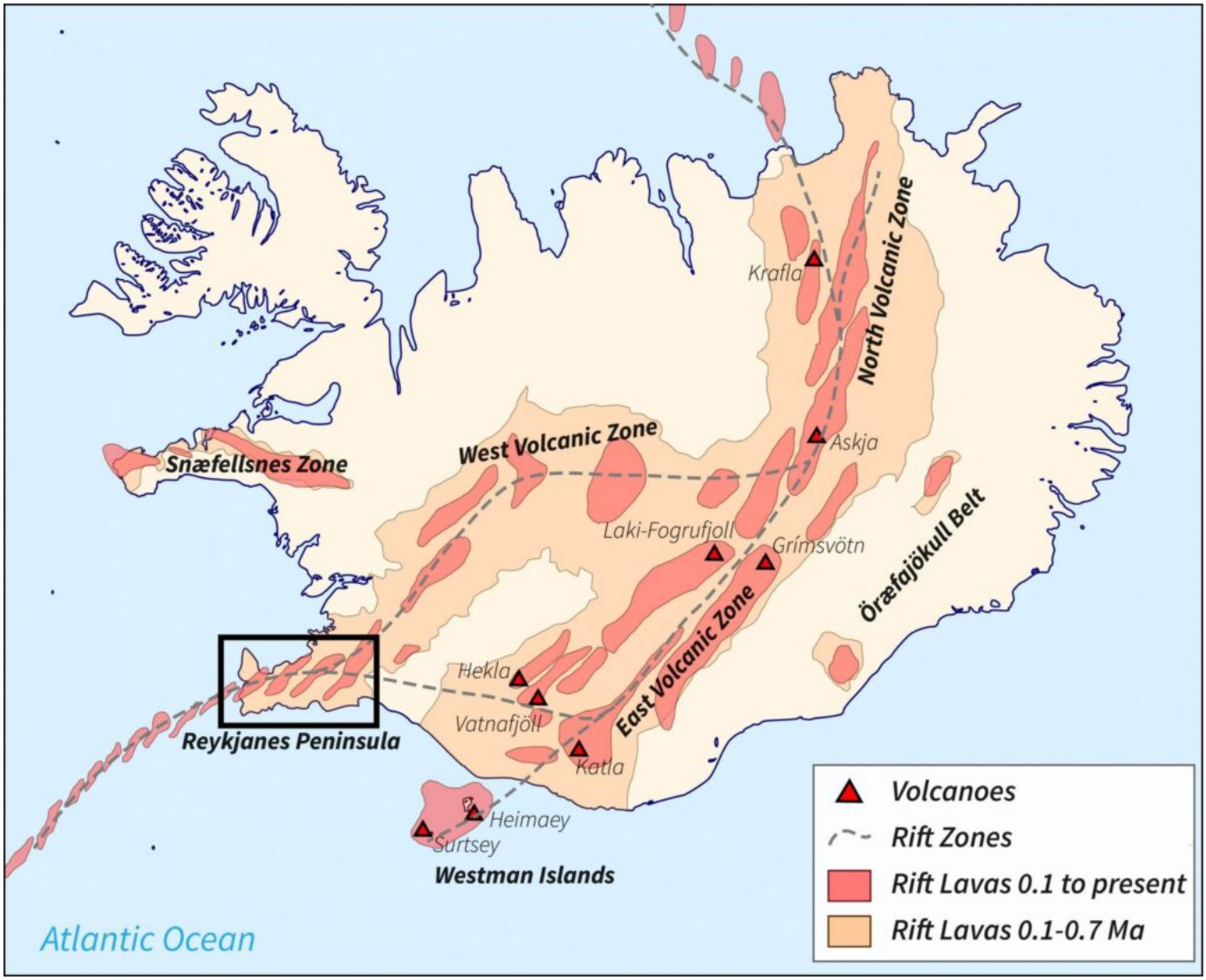
What happens if it erupts?

So far, it's just a warning. But it's credible enough for Iceland to declare a state of emergency. Recent earthquakes in the area are an ominous sign. If it does erupt, there are several possible scenarios that could affect air traffic.

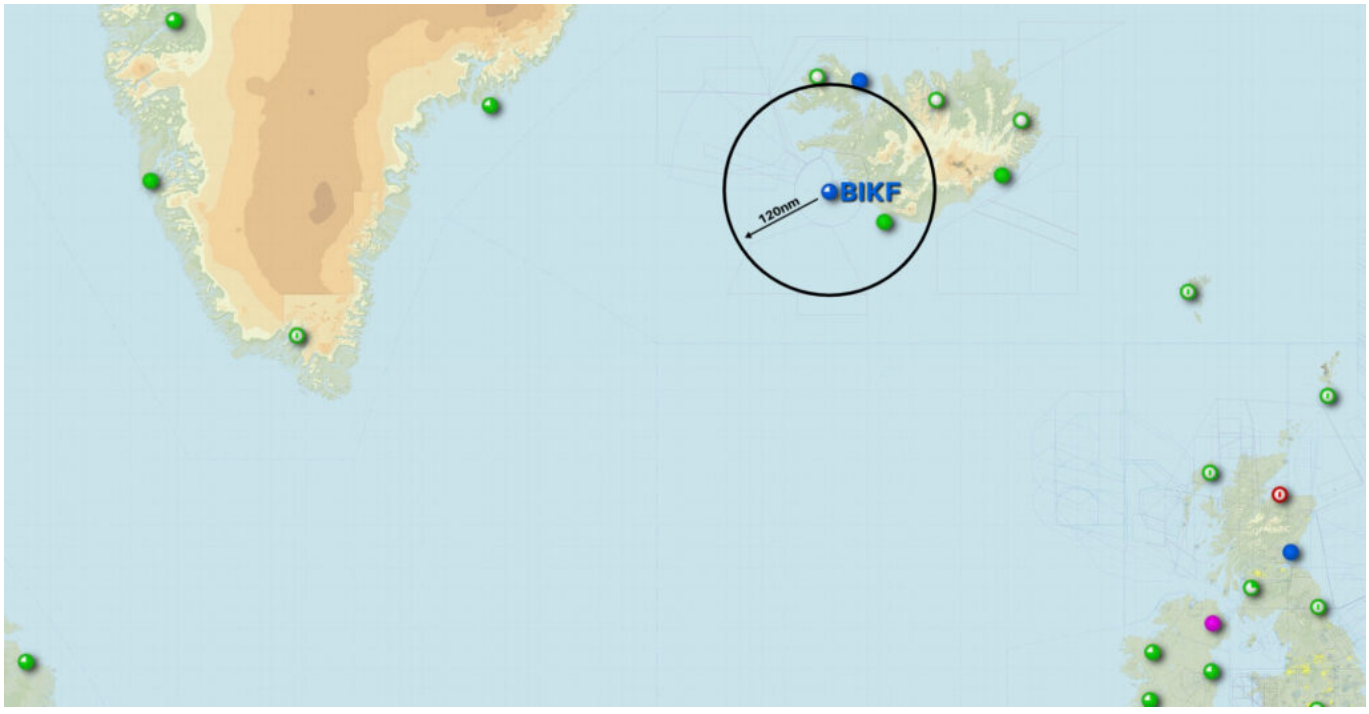
- **BIKF/Keflavik may close.** Unlike previous eruptions, this one is just 10nm away from the airport and a little further from the Icelandic capital, Reykjavik. Aside from being a major airport in its own right, BIKF is a commonly used ETOPS/EDTO alternate for traffic crossing the NAT.
- **Part of the NAT HLA may become unusable depending on the spread of ash.** More southerly routes than usual may become a requirement which means extended flight times and more fuel.
- **Major airspace closures could occur for an extended period of time.** The European mainland may once again be in the firing line, thanks to the mid-latitude westerlies.

Yeah but what ACTUALLY happens?

If the volcano warning goes to code **RED** (it's currently code **ORANGE**), that basically means an eruption has started. In this case, **the airspace within a 120nm radius will close**, until they confirm there's no ash cloud. They currently think there is a 15km long line where magma is flowing and moving towards the surface – an eruption could happen anywhere close to that line.



120nm of closed airspace around BIKF/Keflavik airport (remember, the volcano is just up the road) would look something like this:



There’s also a thing called the Volcanic Ash Contingency Plan that ICAO put together. This doc is the one you want to read – there are a few more scattered around online, but they’re all older versions of this one.

Where was ICAO when the Westfold fell?

This doc sprang from the misery caused by the eruption in 2010, and aims to set out what actually happens if a big volcano erupts.

Essentially, it goes like this:

1. **Volcano erupts. There’s ash all over the place.**
2. **Volcanic ash people issue a volcanic ash warning.**
3. **Notam people issue a Notam.**
4. **Pilots/Operators read the Notam and don’t fly into the ash. ATC help them.**

All volcano walking tours are cancelled.

What should I do if I fly through ash?

Don’t fly through ash.

But if you do, then do this:

1. **Reduce thrust.**
2. **Do a 180 degree turnback.**
3. **Put masks on.**
4. **Declare MAYDAY.**
5. **Panic a bit as you do whatever emergency tasks you need to do.**
6. **Divert somewhere pronto.**

Or as it says in more official language in the Contingency Plan:

Appendix 1 (page 2 of 2)
— Anticipated Flight Crew Issues when Encountering Volcanic Ash —

4. Depending on the severity of the encounter, the reaction of the flight crew will be as follows:

a) Carry out the emergency drill for a volcanic ash encounter. This generally has the following elements:

i. Reduce thrust to idle if possible. *By reducing thrust, the temperature in the combustion section will be lower and less ash will deposit in the engine. Also lower thrust requires lower airflow (and ash) through the engine. To maintain a safe speed, the aircraft will have to descend. The resulting descent rate will be less that during an emergency descent due to pressurisation failure.*

ii. Execute a descending 180 degree turn. A turnback is usually the quickest route out of an ash cloud.

iii. Don oxygen masks if required. This may make communication on the flight deck and with ATC difficult.

iv. declaration of an emergency (MAYDAY MAYDAY MAYDAY) or request for an immediate reclearance possibly accompaniment by an urgency signal (PAN PAN; PAN PAN; PAN PAN). **Note:** the manoeuvre above may commence prior to an emergency or urgency being declared.

v. Carry out various emergency/non-normal drills as required, such as engine relight, unreliable airspeed, system failure drills.

vi. Communication with Cabin crew and passengers.

b) Diversion to the nearest suitable aerodrome.

c) If an aerodrome is contaminated with ash, the deceleration will be less than usual despite the use of maximum braking, resulting in a longer ground run. This may be aggravated by limited use of reverse thrust to avoid blowing up ash from the runway surface. If reverse thrust is necessary to bring the aircraft to a stop, a dust cloud may be raised.

Flight crew expectations from ATC

5. What the flight crew may require from ATC:

a) An immediate reclearance, laterally and/or vertically.

b) If carrying out the escape manoeuvre, ensuring other traffic is kept clear.

c) vectors to an area clear of ash if possible.

d) Information on the nearest suitable aerodrome and its weather and condition, including braking action. An aerodrome with a long runway.

e) vectors to an alternate and a priority landing.

f) If the windscreen is obscured, an autoland.

g) Emergency services for landing and provision of medical assistance for passengers and crew.

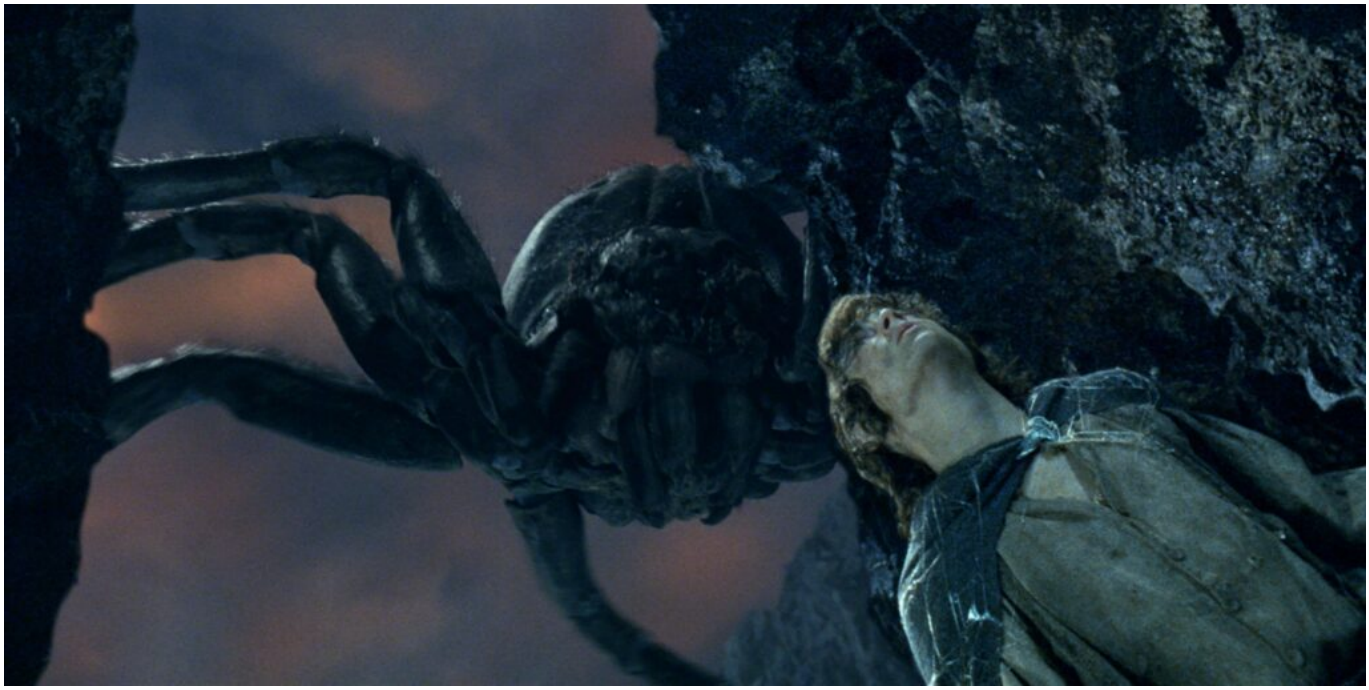
Note: *While carrying out an escape manoeuvre, and associated emergency/non-normal drills, the flight crew workload and the priority to control the aircraft may limit the ability of the crew to communicate to ATC and comply with ATC instructions.*

If I do fly through ash, how scary will it be?

Very scary. Don't do it. Here's a list of nightmarish things that will probably happen if you do:

1. **Smoke, fumes or dust may appear in the cockpit. Get those masks on.**
2. **Engine malfunctions, stalls, over-temperature, thrust loss, engine failure.**
3. **Reduced visibility due to the abrasive effects of ash on windshields and landing lights.**
4. **Pitot tubes may become blocked, so airspeed indications may become unreliable.**

Advice: disconnect the autopilot, set engine thrust to an appropriate value and maintain the aircraft's pitch attitude manually. This will keep the aircraft at a safe speed, but will probably result in difficulty to maintain the assigned altitude. Increased separation is required (above and below).



Another thing that might happen – SPIDERS.

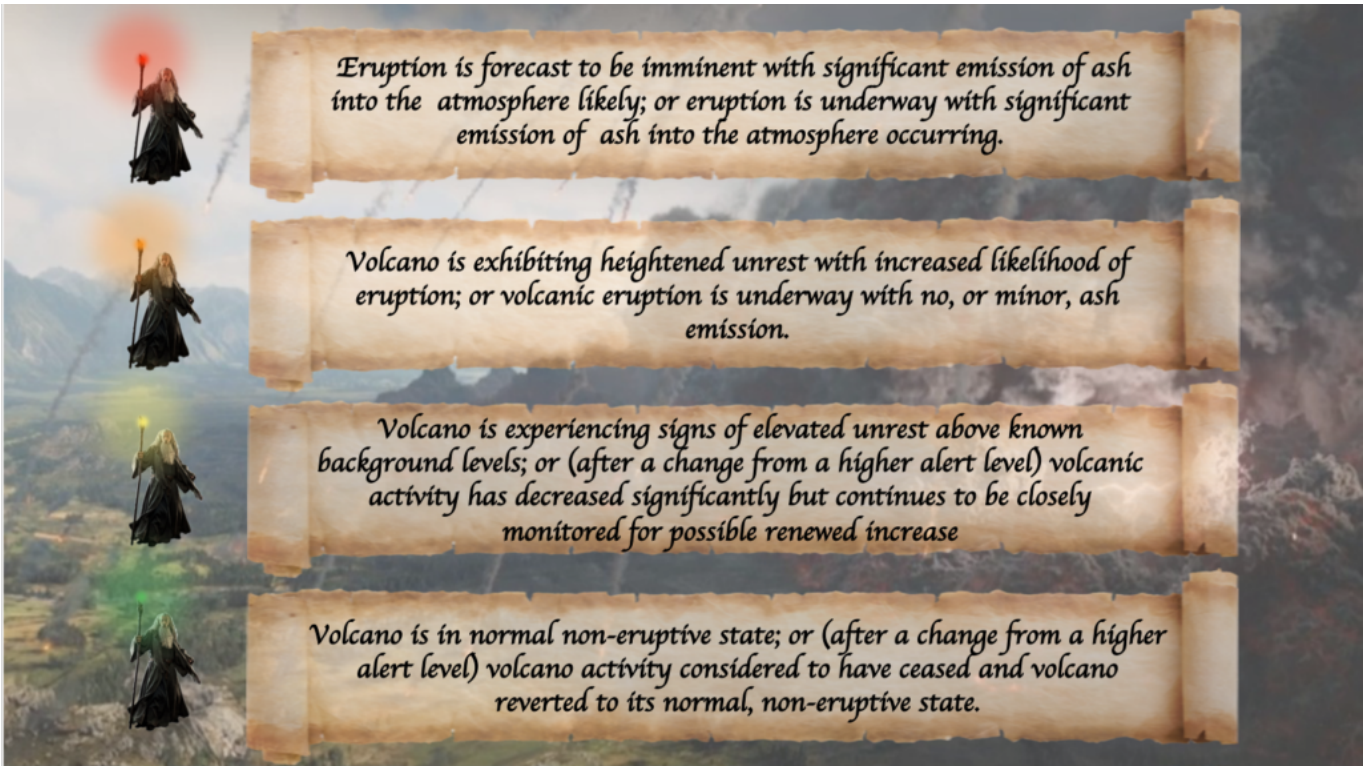
Advisories and Warnings

The London Volcanic Ash Advisory Center (VAAC) is responsible for issuing any ash advisories for this region. You can access those here.

Senior staff meeting at the London Volcanic Ash Advisory Center.

The current alert level is **Orange**. Verbatim, this means that the volcano is *'exhibiting heightened unrest with increased likelihood of eruption; or that an eruption is underway with minor ash emission…'* Or in other words, it may be about to erupt.

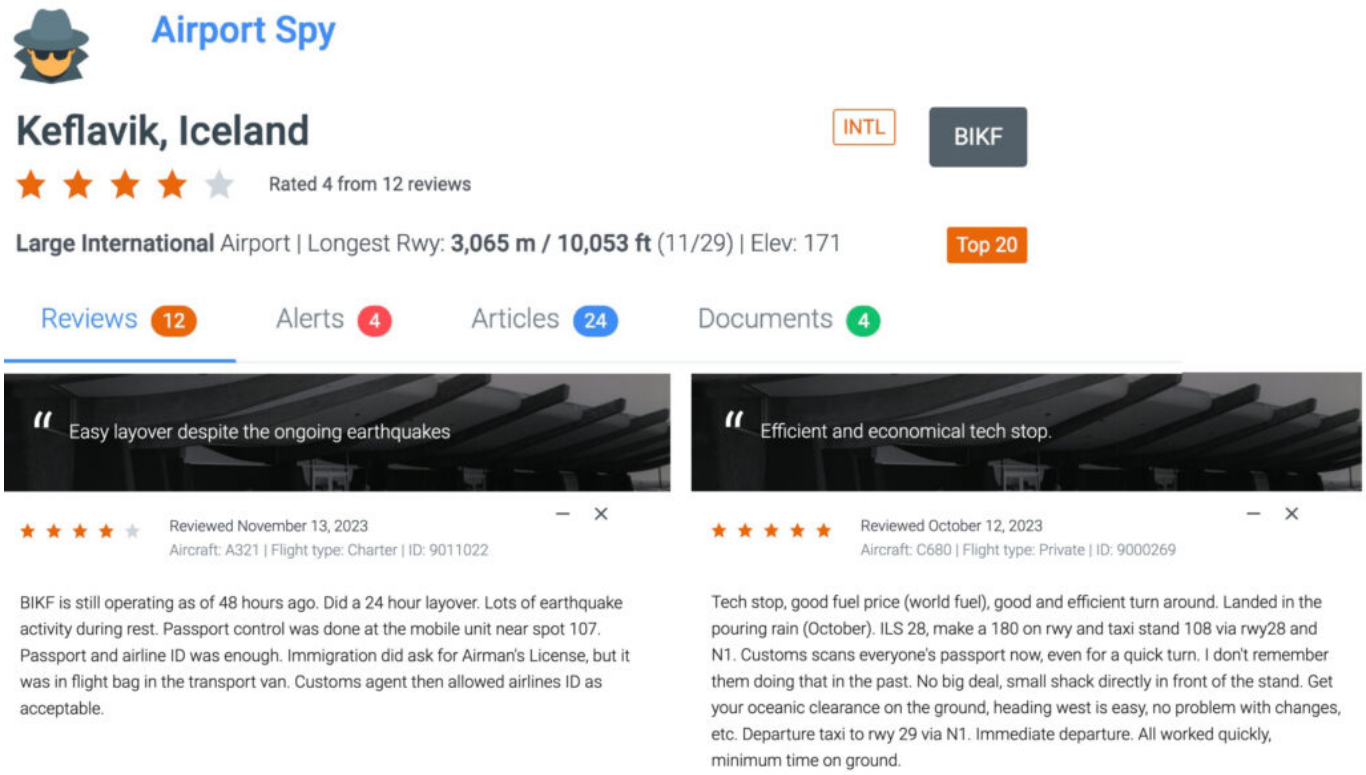
If you're not familiar with the volcanic alert scale, here's how it works:



All traffic crossing the NAT or operating over Western Europe right now should be keeping a close eye on this one.

What's the latest at BIKF/Keflavik Airport?

We've had a couple of reports from members who have been through there recently. If you've got anything to add, please file a report at Airport Spy! For info from the airport, you can contact the local handlers at jetcenter@icelandair.is or ops@southair.is.



Click image for full reports at Airport Spy homepage.