



ISAVIA

Winter Operations at Keflavik Airport

**HB700 05 - 1
December 2022**

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Samþykkjandi: Forstöðumaður Flugvallarþjónustu ÞOR

1 Background

This document describes in brief the preparedness for winter operations at Keflavik International Airport. In accordance with EU regulation no.139/2014, aerodromes shall develop and implement a snow plan that prepares the airport for exposure to winter conditions. The snow plan documentation for Keflavik International Airport in compliance with the regulation is set out in the Icelandic AIP publication¹.

The current document elaborates further on the winter operation procedures, including the apron winter service.

2 Organisation and resources

2.1 Organisation

Airport Operations department (AO) is responsible for aircraft rescue and firefighting services (ARFF) on the airport, as well as the winter service on runways, taxiways, and aprons. The AO shift manager oversees the total operation while an assisting shift manager called the Snowking is responsible for the winter service in the whole aircraft manoeuvring area. A second assisting shift manager, Fire Command, takes the role of an Apron Supervisor during

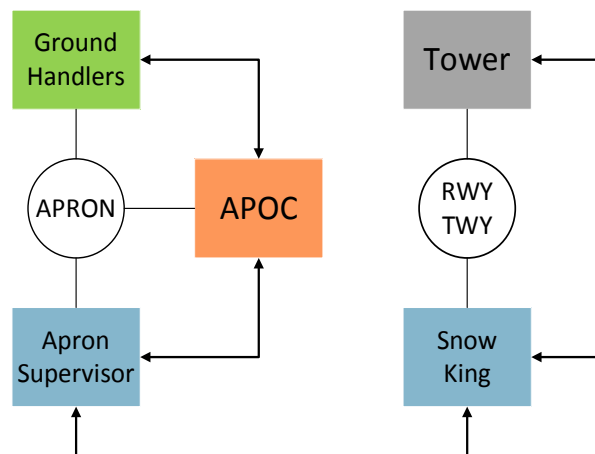


Figure 1. Organization and communication lines of winter service

snow work on the apron. Thereby the Snowking can pay his full attention to the runways and taxiways, while the Apron Supervisor takes care of the apron and aircraft stands. The Airport Operations Center (APOC) handles communication between AO and other apron staff, including ground handlers.

2.2 Equipment

AO department is well equipped in terms of machines for snow removal and anti-skid treatment on the airport surfaces:

- 11 PSB Snow machines (3 in 1 Ploughing – Blowing – Sweeping vehicles)
- 5 Anti-skid spreaders (solid chemical or winter grit)
- 2 De-icing liquid spreaders

¹ <https://eaip.isavia.is/> : Paragraph AD1.2.2 and AD 2.7.

HB700 05 - 1 Winter Operations at Keflavik Airport

Sampykkjandi: Forstöðumaður Flugvallarþjónustu ÞOR

- 9 Payloaders
- 4 Snow blowers
- 1 Grader

2.3 Manpower

Our work force consists of four shift groups of 15 men working 12 hrs shifts 24/7, and 2 shift groups of five men each, working 12 hrs daytime shifts seven days a week. ARFF duties exclude 4 to 6 men from winter service tasks at any time.

Based on the weather forecast, additional staff is mobilised to boost the snow team's capacity when needed. Additional workers are thereby mobilised from the passenger transport division, in addition to regular shift workers being called in on their off days, and even mechanics from the maintenance workshop.

A recent arrangement (autumn 2022) with a local contractor allows us to call in additional workers and machines for special winter service tasks on the apron and service roads.

2.4 Materials

We use both solid and liquid de-icing chemicals on the aircraft manoeuvring area. Grit is used on the apron and taxiways when the conditions are suitable for that.

- Liquid chemical: Potassium formate (KFOR)
- Solid chemical: Sodium formate (NAFO)
- Grit (sand): Crushed and washed aggregate, 0.25 - 4.75 mm

When no longer needed, grit is carefully cleared from the manoeuvring area to reduce the risk of jet engine ingestion of grit.

Solid chemical is mainly used on the apron and taxiways for preventive treatment against black ice formation. Liquid chemical is spread on the runways and used as well as a prewetting agent for solid chemical and grit.

Common road salt, NaCl, is only used on service roads, including apron roads not crossing aircraft taxi lines.

3 Procedures

3.1 Winter service priorities

The following priorities have been established for the clearance of the movement area at Keflavik Airport:

1. Active runway and rapid exit taxiway
 - Service target: RWYCC 4 or higher, cleared runway width ≥ 45 m
2. Taxiways serving active runway. Scheduled aircraft stands. Apron service roads. Access routes for emergency vehicles to active runway.
 - **Priority task #2 is equivalent to task #1**
Exception: During especially difficult or hazardous weather conditions, runways always have first priority
3. East apron and adjacent taxiways S-1 and N-1. Apron stands 101-111, 116-123.

HB700 05 - 1 Winter Operations at Keflavik Airport

Samþykkjandi: Forstöðumaður Flugvallarþjónustu ÞOR

Keflavik Airport is a two-runway aerodrome. Depending on weather situation, the snow team is often faced with major challenges to maintain the usability of runways and taxiways. Users must not expect both runways to be always available.

- Situations like prolonged snowfall, snow-drifting or freezing rain make it impossible to attend both runways at the same time.
- The second runway is then cleared as soon as possible.
- The second runway is however serviced as necessary to maintain a maximum delivery time of 30 minutes, should an unexpected event call for urgent change of active runway

3.2 Inspection, communication, and reporting

3.2.1 Preparing for wintry conditions

For any inquiries, requests or reports concerning winter operations please contact APOC, apoc@kefairport.is or by telephone +354 425 6200.

We have defined a winter condition index (WinCon) to establish a common ground for communicating winter operations preparedness. A scale from 1 to 4 is defined in terms of expected winter weather impact on winter service and aerodrome operations in general, see Table 1.

We aim to announce the expected WinCon based on weather forecast and/or current weather development. Different WinCons will be associated with particular action items and recommendations. Examples are

- Call out additional staff
- Intensified surface condition assessment
- Stowing of handling equipment
- Removal of compacted snow or ice preparing for weather changes

It should be noted that different WinCon classes may lead to different surface conditions. It should not be expected that a particular WinCon guarantees any given surface condition on the movement area, as defined under section 3.2.30. Surface condition may also be deteriorated without any WinCon being announced simultaneously, as contamination may sustain on the ground for days during constant weather conditions.

HB700 05 - 1 Winter Operations at Keflavik Airport

Samþykkjandi: Forstöðumaður Flugvallarþjónustu ÞOR

Table 1. Winter condition classification.

Winter condition class	Weather description	Expected impact on service and priorities
WinCon 1 Light	<p>Precipitation: Showers of snow LIGHT/MOD</p> <p>Wind: No snow drifting</p> <p>Dew and surface wetness: Surface frost or black ice</p>	<p>Normal operation.</p> <p>Priorities as published</p> <p>Apron Surface: CLEAR (green) or CAUTION (yellow)</p>
WinCon 2 Moderate	<p>Precipitation: Continuous snowfall LIGHT/MOD</p> <p>Wind: Light snow drifting</p>	<p>Normal operation.</p> <p>Priorities as published</p> <p>Apron Surface: CAUTION (yellow) or UNRELIABLE (orange)</p>
WinCon 3 Heavy	<p>Precipitation: Snowfall MOD/HEAVY or prolonged snow showers LIGHT/MOD</p> <p>Dew and surface wetness: Rain on frozen ground or supercooled rain</p> <p>Wind: Significant snow drifting</p>	<p>Expect Winter service on Apron to be delayed, single stand at a time.</p> <p>Expect TWYs snow covered</p> <p>Apron Surface: CAUTION (yellow) or UNRELIABLE (orange)</p>
WinCon 4 Extreme	<p>Precipitation: Snowfall MOD/HEAVY</p> <p>Wind: Blizzard, no visibility</p>	<p>Expect only RWY winter service</p> <p>Aircraft may line up on TWYs</p> <p>Apron stands not serviced</p> <p>Apron Surface: Snow cover or ice, local snow drifts. UNRELIABLE (orange) / INOPERABLE (red)</p>

3.2.2 Runway inspection and reporting

Surface condition assessment and reporting on the movement area is a necessary part of the aerodrome winter services. Runway assessment and reporting follows GRF, the Global Reporting Format. The principles of GRF are explained in the AIP. The runway condition is reported whenever significant changes occur, the reports are submitted by SNOWTAM and via ATIS (<https://www.isavia.is/en/corporate/c-preflight-information/snowtam>).



Figure 2. Apron priorities. The green areas are serviced on a daily basis. The yellow ones are serviced on demand in collaboration with APOC and The Coast Guard. The aircraft stands in red east of hangar 885 are closed during winter.

3.2.3 Apron inspection and reporting

The SNOWTAM message is primarily aimed at air crews and flight dispatchers. To ensure that ground handlers can prepare for winter conditions on the aircraft stand, we have adopted our own assessment and reporting system for the apron. Our aim is that all aircraft stands have been inspected and reported before use.

Aircraft stands are inspected and treated as needed within the operational capacity of the snow team according to flight schedule. The Apron Supervisor of the AO snow removal team is responsible for assessing and reporting the surface condition on individual aircraft stands. The apron surface conditions are categorised according to the scheme presented in Table 2. The current condition for all stands is on display on a dedicated web-page where stakeholders with daily operations on the apron can access the information. The site has access control, contact APOC for information.

Due to less traffic in wintertime than during summer, we organise the aircraft stand allocation to maximize the efficiency of winter service. We do this by shutting down parts of the apron space in winter. Figure 2 shows what arrangement is valid for the winter.

HB700 05 - 1 Winter Operations at Keflavik Airport

Sampykkjandi: Forstöðumaður Flugvallarþjónustu ÞOR

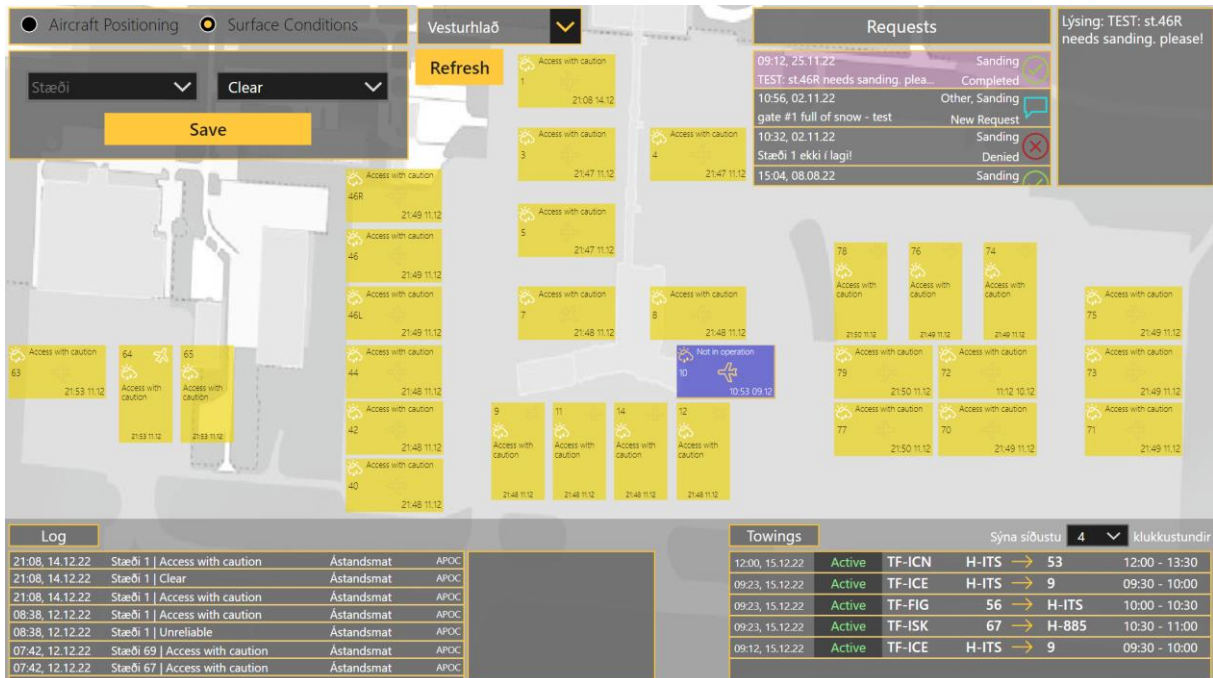


Figure 3 The aircraft stand surface condition web-page. An example indicating „yellow class“ conditions „Access with caution“ for all aircraft stands at the terminal.

Table 2. Surface condition classification system for winter conditons on the apron

Color code	Surface condition class	Advice
Green	Clear	Normal winter operation
Yellow	Access with caution	
Orange	Unreliable	Use stand with great care
Red	Inoperable	No handling advised

Details on the surface condition classification are available in the Apron surface assessment guide².

² <https://www.isavia.is/fyrirtaekid/c-forflugsupplýsingar/flugvedur/keflavikurflugvollur-bikf> , <https://www.youtube.com/watch?v=dmznEjhdFsY>

HB700 05 - 1 Winter Operations at Keflavik Airport

Samþykkjandi: Forstöðumaður Flugvallarþjónustu ÞOR

3.3 Recommendations to ground handlers

During wintry conditions, as always, all members of the airport community are responsible for contributing to safe operation, focusing on passenger experience. To minimize the impact of winter conditions on the apron operations, including aircraft handling, efficient snow removal and friction improving measures is necessary. To facilitate this, keep in mind that according to the aerodrome Safety Rules, the winter service machines have priority over other vehicles on the apron. Good housekeeping practices to enable efficient winter service includes

- Park your GSE in the assigned places and as far front at the stand as possible
- Stow wheel chocks and cones in the designated crates when not in use
- Remove cars, baggage trolleys and other GSE items from the stand, if snow removal machines or anti-skid spreaders are expected
 - This is important both when requested by APOC for a pre-planned service action, and when stands are to be treated just in time for aircraft handling
- Inform APOC if you find the announced surface condition for your stand not according to expectations
- Help yourselves to the grit bins positioned at all stands when needed.
- Respect that AO may need some time, depending on the circumstances, to respond to service requests
- Keep updated on current weather and forecasts

<https://www.isavia.is/fyrirtaekid/c->

[forflugsupplýsingar/flugvedur/keflavikurflugvollur-bikf](https://www.isavia.is/fyrirtaekid/c-forflugsupplýsingar/flugvedur/keflavikurflugvollur-bikf)



Figure 4 Ground handling in winter time.

HB700 05 - 1 Winter Operations at Keflavik Airport

Samþykkjandi: Forstöðumaður Flugvallarþjónustu ÞOR

3.4 Aircraft de-icing

Aircraft de-icing is conducted at the aircraft stand. Ground handling companies provide the service upon direct contact.

3.5 Winter service landside

Winter service in the terminal area on footpaths, parking lots and roads is carried out by external contractor. All inquiries and complaints are welcomed by APOC.

4 Appendix

4.1 Resource consumption and snowfall amount

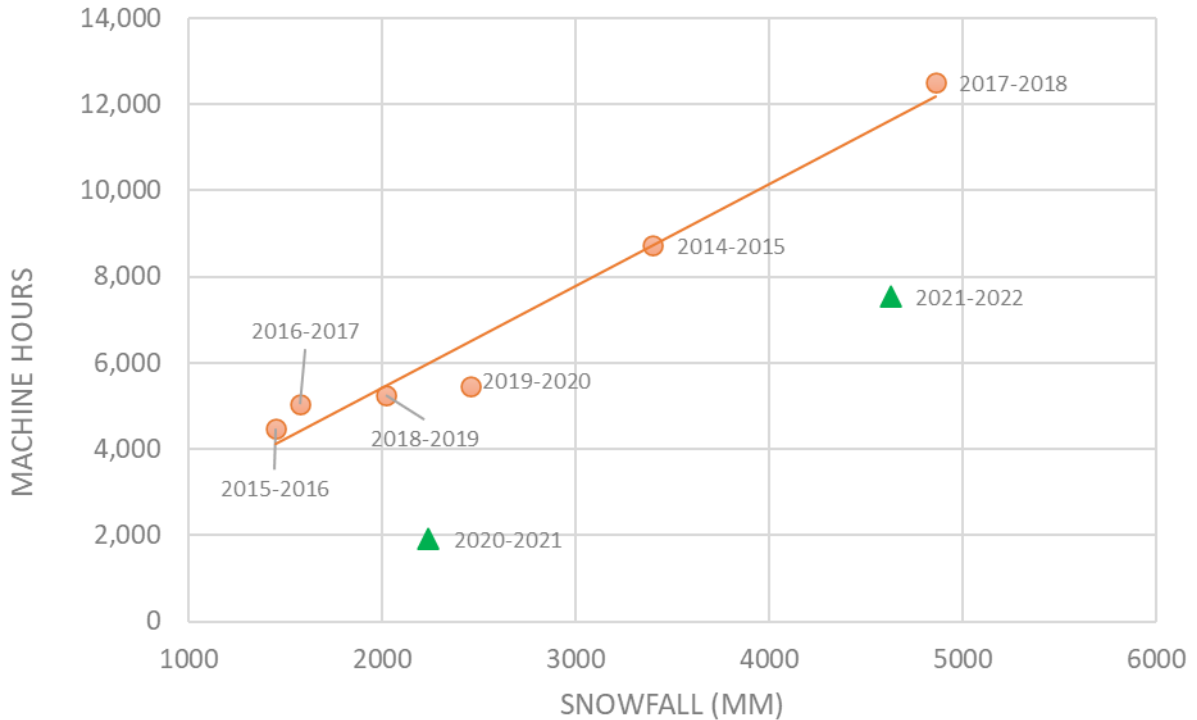


Figure 5 Machine hours spent on snow removal vs. accumulated snowfall.

Table 3 Seasonal de-icing chemical consumption.

	SOLID DE-ICER – Sodium formate (ton)	LIQUID DE-ICER - Potassium formate (m3)	GRIT Sand 0.25-4.75 mm (ton)
2014-2015	44	94	1590
2015-2016	35	74	1420
2016-2017	46	72	1100
2017-2018	140	288	3100
2018-2019	156	241	1943
2019-2020	141	335	1760
2020-2021	39	156	433
2021-2022	116	190	1080

HB700 05 - 1 Winter Operations at Keflavik Airport

Samþykkjandi: Forstöðumaður Flugvallarþjónustu ÞOR

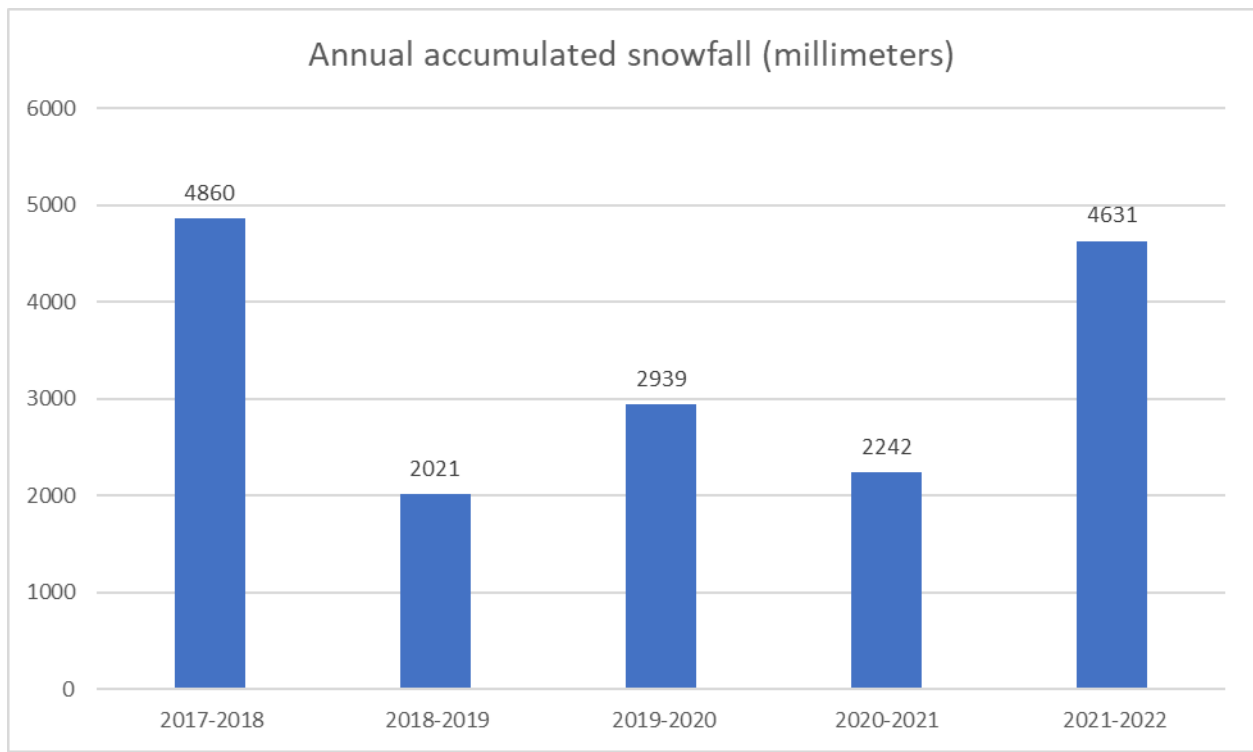


Figure 6 Annual snowfall in Keflavik Airport is very variable.