Nordic SWC User Guide

Contents

Introduction

Nordic Significant Weather Chart *(Nordic SWC)* is a graphical aviation weather product which geographically covers most NAMCON countries and their surroundings.

Nordic SWC is a combination of low (L), medium (M) and high (H) atmosphere SIGWX *(significant weather),* extending from the surface to FL450. Nordic SWC is produced to support WAFC *(World Area Forecasting Center)* charts, by providing more detailed information on regional weather circumstances with shorter lead time. It is also recommended to be used alongside with low level forecasts.

Nordic SWC is produced jointly by four meteorological institutes inside NAMCON: Finland (FMI), Sweden (SMHI), Denmark (DMI) and Norway (MET Norway). Each country's MWO *(Meteorological Watch Office)* is responsible for chart production, focusing especially on their own FIRs. However, the chart is still issued either by FMI or SMHI every six hours, some four hours before chart's validity time. Latest chart is available on joint Nordic portal www.northavimet.com and also on possible national websites for distribution.

Nordic SWC is monitored continuously and amended (AMD) or corrected (COR) whenever needed. Amending criteria are presented on page 9. Nordic SWC is a harmonized product both geographically and also with other *en-route* or regional products like SIGMET and low level forecasts within FIRs under responsibility of these four MWOs.

Chart content

Significant weather

Widespread significant precipitation

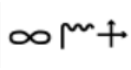
Rain, snow, rain and snow (sleet)	 Rain, Snow, Sleet
Rain shower, snow shower, sleet shower	 Showers
Freezing rain, freezing drizzle	 Freezing rain/drizzle
Thunderstorm, hail	 Thunderstorm, Hail
Drizzle, snow grains	 Drizzle, Snow grains

Demarcation of significant weather

Demarcation of significant weather: Green scalloped line	 Significant weather (SIGWX)

Areas of widespread significant clouds, significant precipitation, OCNL/FRQ/EMBD/OBSC CB/TCU clouds, and moderate or severe icing are delineated with the scalloped line.

Widespread phenomena reducing visibility

Mist, fog, freezing fog	 Mist, Fog, Freezing fog
Haze, smoke, blowing snow	 Haze, Smoke, Blowing snow

Areas of widespread phenomena reducing visibility are delineated using the low ceiling/visibility line, see below.

Low clouds and poor visibility

Widespread low cloud ceiling and/or poor visibility is delineated with a yellow dashed and toothed line, with its teeth pointing into the area.

Low ceiling/visibility is defined as

- visibility < 5000 m, and/or
- ceiling (BKN/OVC cloud base) < 1000 ft

Delineation of widespread low ceiling/visibility areas: yellow dashed and toothed line	 Ceiling<1000ft and/or visibility<5km

Note. Low ceiling/visibility is not detailed in mountain areas (shown with grey shading on the chart). On the other hand, mountain obscuration (MT OBSC) symbols may be used.

Clouds

Cloud **amount** (other than CB or TCU) is described by **FEW** (1-2/8), **SCT** (3-4/8), **BKN** (5-7/8), **OVC** (8/8), or **SKC** (0/8). **Cloud type** is **not identified**, **except for TCU** and **CB**. **LYR** may be used for layered clouds (when there's a cloud free dry layer at least ~2000-3000ft thick).
Cloud **height**, base and top, is indicated **in hectofeet above the surface below FL050**, and **from FL050 in flight levels**. Cloud height is indicated using three digits (e.g. 005 = 500ft, 120 = FL120) with top over base. A range can be used for both cloud base and/or cloud top. In general low clouds (below 1500 ft) are indicated with 100 ft resolution, between 1500 ft and FL100 with 500 ft resolution and above FL100 the resolution is 1000 ft.

In the Nordic SWC, significant clouds (delineated with green scalloped line) are defined as clouds with an amount of **at least BKN** causing

- **moderate or greater icing**, and/or
- **significant weather** (in practice, precipitation)

Example: Cloud bases of BKN layer in the area vary between base1 and base2 and cloud tops vary between top1 and top2	BKN $\frac{\text{top1 - top2}}{\text{base1-base2}}$

CB and TCU clouds (Cumulonimbus and Towering Cumulus)

- **ISOL CB/TCU** (*isolated)*; individual features with a maximum spatial coverage less than 50 % of the area concerned)
- **OCNL CB/TCU** (*occasional)*; well-separated features with a maximum spatial coverage between 50 and 75 % of the area concerned)
- **FRQ CB/TCU** (*frequent);* little or no separation between adjacent clouds with a maximum spatial coverage greater than 75 % of the area concerned)
- **EMBD CB/TCU** (*embedded*) is additionally used when CB/TCU clouds are embedded within cloud layers and cannot be readily recognized
- **OBSC CB/TCU** (*obscured*) is additionally used when CB/TCU clouds are obscured by haze or smoke

Widespread CB/TCU clouds with area coverage of at least OCNL, or EMBD/OBSC CB/TCU clouds are delineated with the SIGWX scalloped line.

Icing

Moderate or severe icing, with forecasted base and top	Moderate/Severe icing
Delineation of icing: green scalloped line, additionally blue short dashed line if icing conditions vary significantly inside a SIGWX area	Change in icing

- **INC** *(in cloud)* can be used to specify levels where icing occurs

Turbulence

Moderate or severe turbulence, both high and low level turbulence with forecast vertical extent	Moderate, Severe turbulence
Delineation of low level turbulence (below FL100): purple dashed line	Low level turbulence
Delineation of high level turbulence: grey dashed line	High level turbulence

If the layer of turbulence starts at the surface and extends above FL100, the low level turbulence line is used.

Mountain waves

Significant (MOD or SEV) mountain wave (MTW) activity is forecast with the MTW symbol over the area affected and it is delineated with the turbulence line (i.e. risk for associated turbulence is considered high, even though not all MTW are turbulent).

Mountain waves

Mountain obscuration

The mountain obscuration (MT OBSC) symbol is used when mountains are forecasted to be obscured by clouds or poor visibility **over a widespread area** (in the vicinity of the symbol), e.g. mountain tops cannot be seen from below the cloud base and/or from above the cloud top.

Mountain obscuration

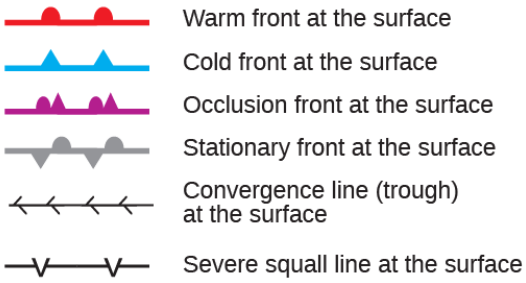
Jet streams

The jet stream axis (strongest wind within the jet stream) is marked on the chart when the wind speed is at least 80kt. The jet stream axis height is indicated in flight levels. The jet stream axis is intersected by two slashes (//) where the wind speed changes by at least ±20kt and/or the jet stream axis height changes by at least ±3000ft.

FL280 Position, speed, direction and level of max wind

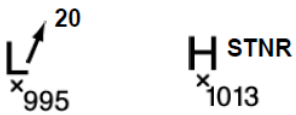
Fronts, troughs and squall lines

Fronts, troughs and squall lines indicate their position at the surface. The movement direction of fronts is indicated with an arrow and their movement speed in knots (or SLW = moving slowly, STNR = stationary).



High and low pressures

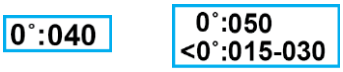
Surface high (H) and low (L) pressure centres are marked on the chart with their forecasted QNH (hPa). Their movement is indicated in the same way as the movement of fronts.



0°C level

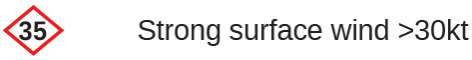
The 0°C level is indicated regionally. If there are multiple 0°C levels at different heights, the highest 0°C level is shown first, and the sub-zero layer below it is indicated separately with the lowest 0°C level as its base (e.g. 0°: FL050, <0°: 010-030).

0°: SFC means that the 0°C level is at (or only a couple of hundred feet above) the surface, or that temperatures are below zero degrees Celsius in the whole troposphere (i.e. no 0°C level).



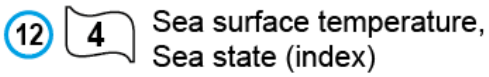
Strong surface wind

Widespread strong surface wind above 30 kt is marked on the chart over the area concerned (no delineation).
Note. The value indicated is the mean wind speed, i.e. gusts can be significantly stronger.



Sea surface temperature and sea state

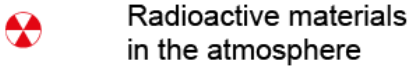
Mean sea surface temperature (°C) and significant wave height (index) is indicated over the main sea areas. The sea state index values and corresponding wave heights are described in the table below.



Wave height (m)	Sea state index
0 – 0,1	0/1
0,2 – 0,5	2
0,6 – 1,2	3
1,3 – 2,5	4
2,6 – 4	5
4 – 6	6
6 – 9	7
9 – 14	8
> 14	9

Radioactive materials

In case of radioactive material is released into the atmosphere the incident location is marked on the chart with the RAD symbol. Additionally a text box with the RAD symbol, release time, source site coordinates and the text "CHECK SIGMET AND NOTAM FOR RDOACT CLD" is placed on the side of the chart.

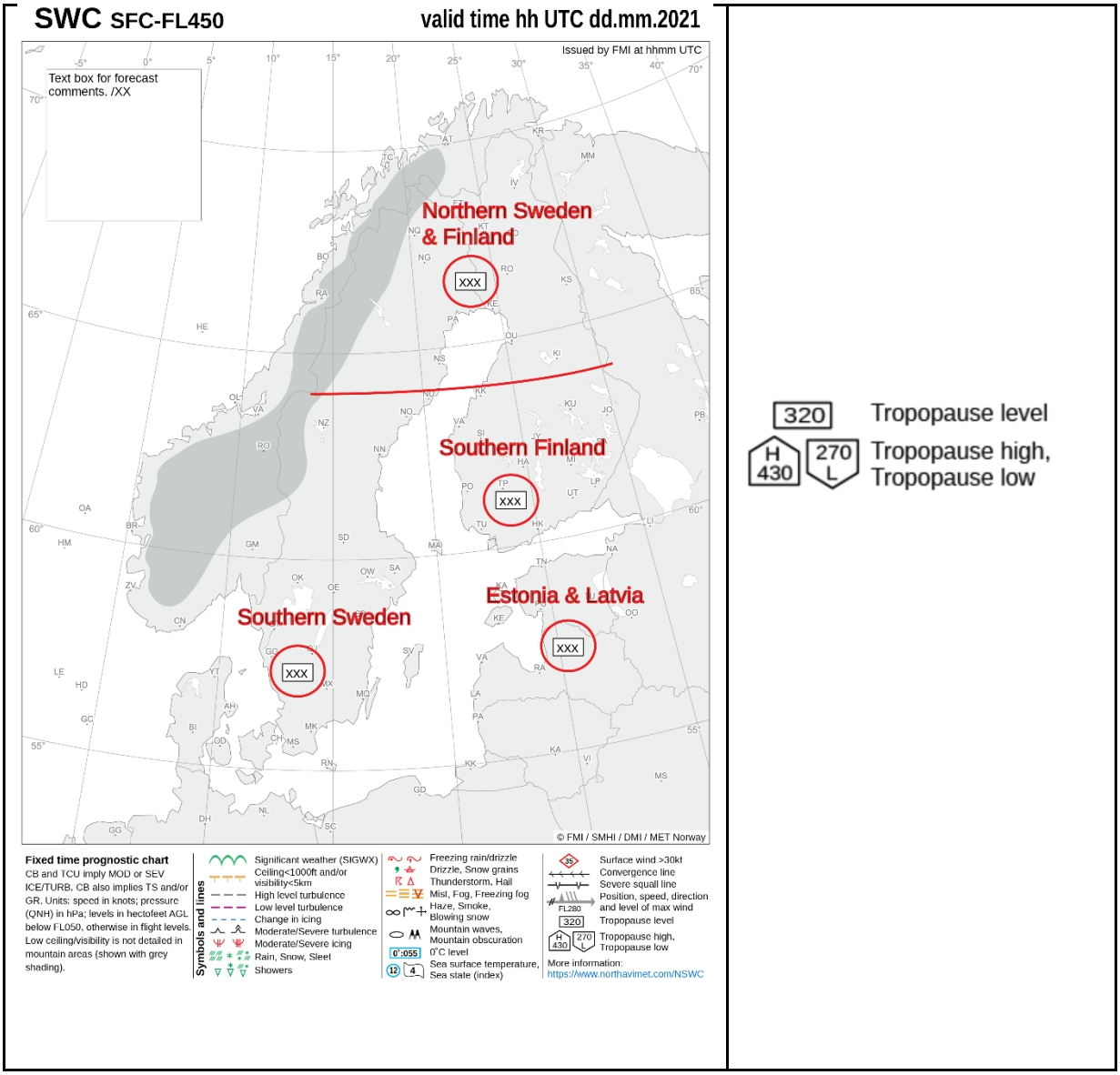


Volcanic ash

If volcanic ash is advected into the chart area, a text box with the VA symbol, eruption details and the text "CHECK SIGMET, ADVISORIES FOR VA, ASHTAM AND NOTAM FOR VA" is placed on the side of the chart.

Tropopause level

Tropopause level is indicated in flight levels in four areas (northern Sweden and northern Finland, southern Sweden, southern Finland and Estonia/Latvia) highlighted in the chart below. Additionally possible tropopause minima and maxima are indicated, where forecasted, in the chart area.



Text box for forecaster's comments

A text box for comments is located in the upper left corner of the chart. It can be used e.g. to draw the user's attention to significant phenomena or how the situation on the chart is expected to develop.

Additional notes

- The various phenomena can additionally be detailed by **LCA** *(locally)*, **MAR** *(at sea)*, **COT** *(at the coast)*, **LAN** *(inland)*, **MON** *(above mountains)*, or **VAL** *(in valleys)*, and in such cases the phenomenon is not necessarily delineated with the SIGWX or low ceiling/visibility lines
- From Nordic SWC perspective, non-significant clouds are not delineated, but they can be included as additional information (with or without base and top information)
- A widespread area is roughly defined as an area of at least 100*100 km

SWC amendment criteria

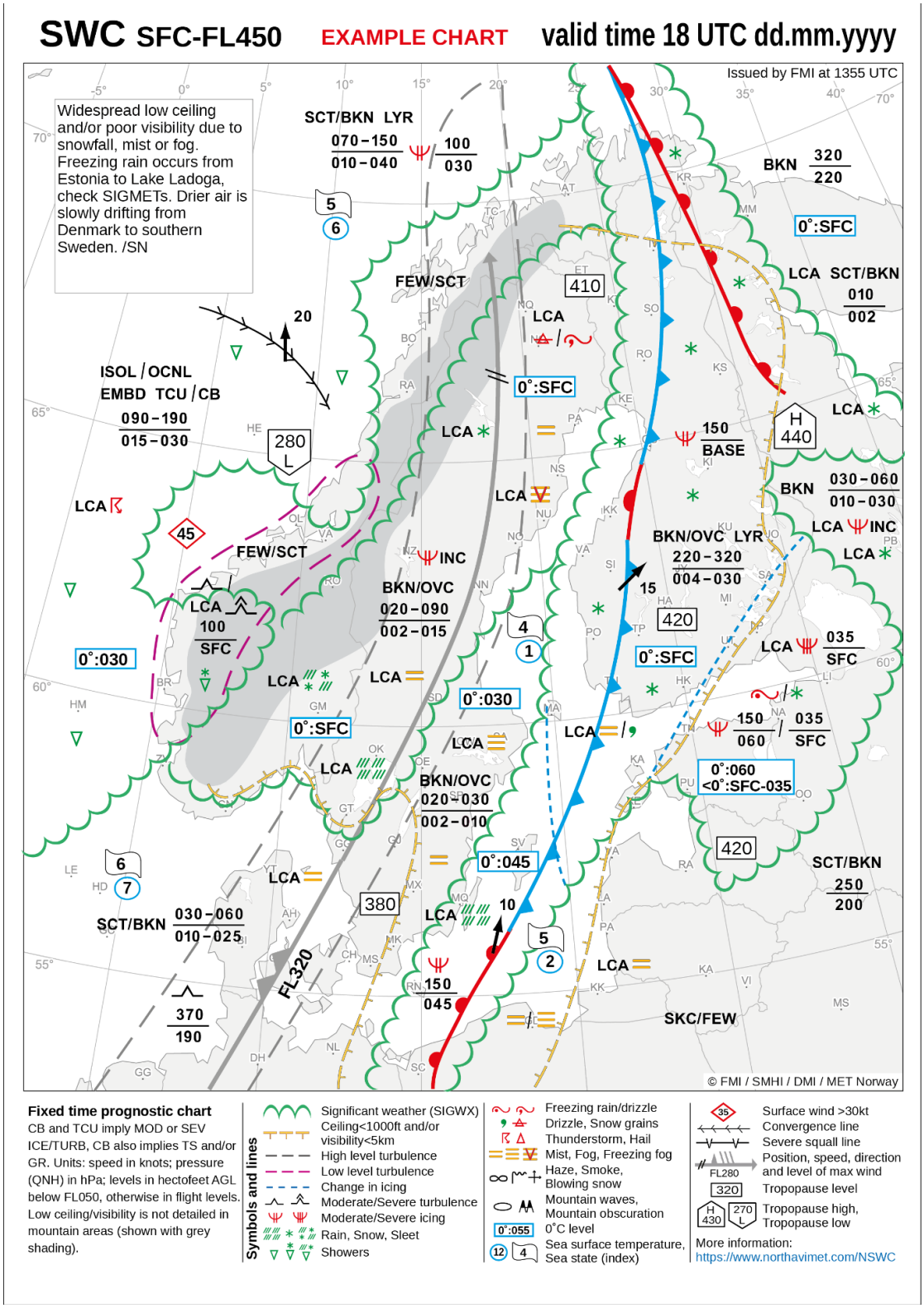
An amendment to the chart is issued (AMD added in the title of the chart) when one of the following phenomena is observed but was not forecasted (or a previously forecast phenomenon is no longer expected):

- SIGMET phenomena
- Widespread
    - Low ceiling/visibility, i.e. phenomena strongly reducing visibility (e.g. mist/fog, moderate drizzle or snowfall, heavy rain, smoke, blowing snow) and/or low cloud ceiling (below 1000ft)
    - Moderate icing
    - Moderate turbulence
    - OCNL/FRQ/EMBD/OBSC CB/TCU clouds, when no CB/TCU clouds had been forecast

In case of a technical error (e.g. typos) a correction to the chart is issued (COR added in the title of the chart).

The chart is monitored for possible amendments from its issue time until +1.5h of its valid time (i.e. the monitoring period is chart valid time -4h…+1,5h).

Nordic SWC example



Extended legend (available also in http://www.northavimet.com/NSWC)

Nordic SWC symbols

- Moderate icing (MOD ICE)
- Severe icing (SEV ICE)
- Moderate turbulence (MOD TURB)
- Severe turbulence (SEV TURB)
- Freezing rain (FZRA, implies MOD to SEV ICE)
- Freezing drizzle (FZDZ, implies MOD to SEV ICE)
- Snow grain (SG, implies icing aloft in cloud)
- Drizzle (DZ)
- Rain (RA)
- Rain and snow (RASN, SNRA)
- Snow (SN)
- Rain shower (SHRA)
- Rain and snow shower (SHRASN, SHSNRA)
- Snow shower (SHSN)
- Thunderstorm (TS)
- Hail (GR)
- Mist (BR)
- Fog (FG)
- Freezing fog (FZFG)
- Haze (HZ)
- Smoke (FU)
- Blowing snow (BLSN)

- Mountain obscuration (MT OBSC)
- Mountain waves (MTW)
- Radioactive materials in the atmosphere (RDOACT)
- Volcanic eruption
- Centre of low pressure
- Centre of high pressure
- 0°C level (0°:055)
- Strong surface wind >30kt (35)
- Sea surface temperature (°C) (12)
- Sea state (index) (4)
- Tropopause level (320)
- Tropopause high (H 430)
- Tropopause low (270 L)

Weather boundaries and lines

- Significant weather (SIGWX)
- Ceiling<1000ft and/or visibility<5km (outside mountain areas)
- High level turbulence
- Low level turbulence
- Change in icing conditions
- Warm front at the surface
- Cold front at the surface
- Occlusion front at the surface
- Stationary front at the surface
- Convergence line (trough) at the surface
- Severe squall line at the surface
- Position, speed, direction and level of max wind (jet stream) (FL280)
- 10kt (feather)
- 50kt (pennant)
- Height of the jet axis changes by ±3000ft and/or wind speed changes by ±20kt

Abbreviations

AMD	Amended
BASE	Cloud base
BKN	Broken (5-7/8)
CB	Cumulonimbus
COR	Corrected
COT	At the coast
EMBD	Embedded in a layer
FEW	Few (1-2/8)
FRQ	Frequent
INC	In cloud
INTSF	Intensifying
ISOL	Isolated
LAN	Inland
LCA	Locally
LYR	Layered
MAR	At sea
MON	Above mountains
OBSC	Obscured
OCNL	Occasional
OVC	Overcast (8/8)
SCT	Scattered (3-4/8)
SFC	Surface
SKC	Sky clear (0/8)
STNR	Stationary
TCU	Towering cumulus
TOP	Cloud top
VAL	In valleys
WKN	Weakening
XXX	Top above chart vertical extent (FL450)