

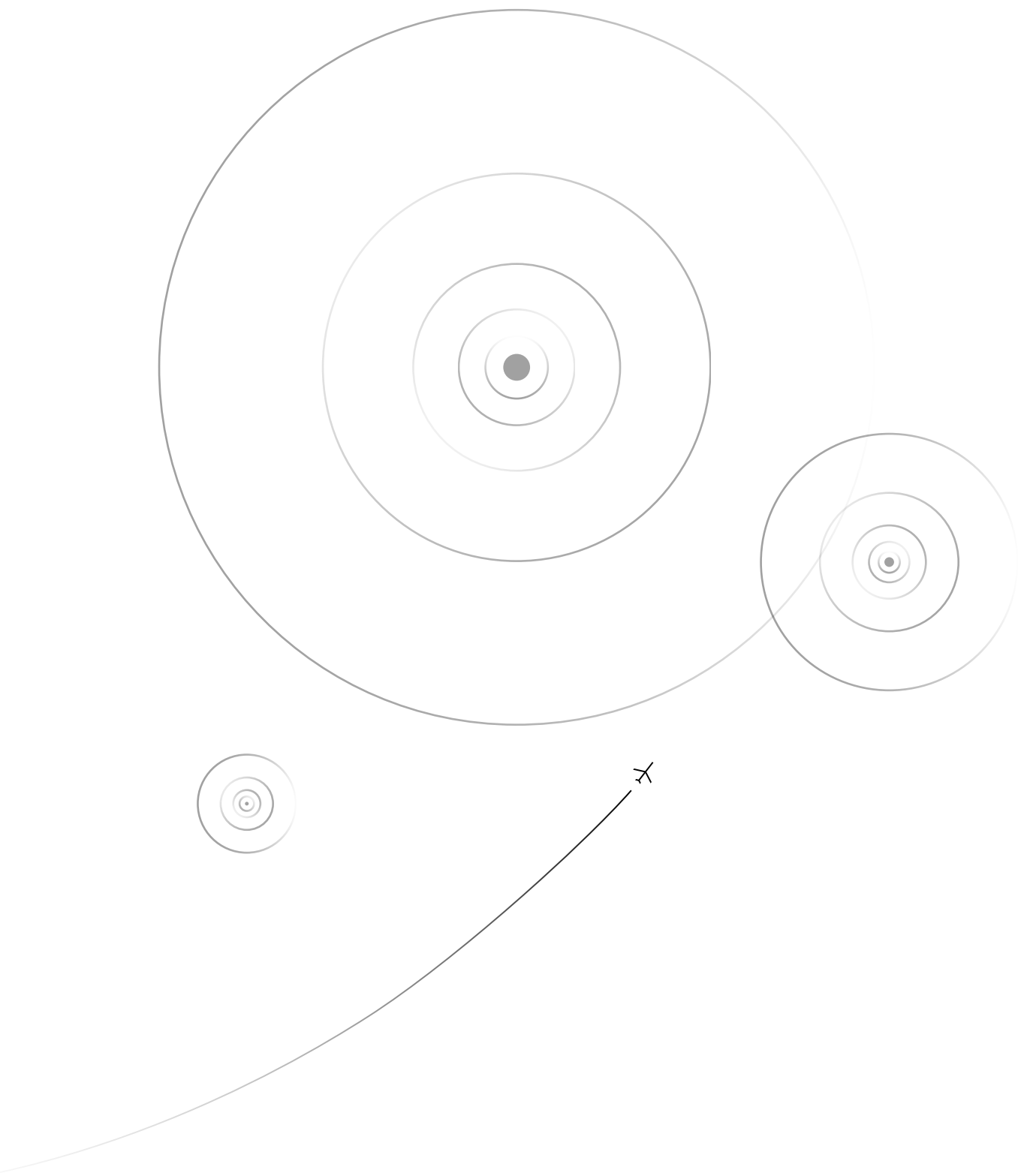
# Report from the working group on GNSS/GPS-disruptions in aviation

Submitted 19 December 2019 and endorsed by the group of State Secretaries  
6 May 2020 (editing completed on 19 December 2019)



# Contents

1	Background for the proceedings of the working group.....	3
1.1	About the working group and its mandate .....	3
1.2	The proceedings of the working group .....	4
2	GNSS disruptions.....	5
2.1	GNSS disruptions in Norwegian airspace .....	6
3	Aviation and vulnerability to GPS disruptions .....	8
4	National and international efforts in aviation .....	9
5	Adjacent technical and responsibility areas.....	11
5.1	The PNT strategy.....	11
5.2	Norwegian Communications Authority (Nkom) .....	11
5.3	Security improvement and the Security Act.....	13
5.4	Other Norwegian agencies.....	14
6	Preparedness, incident management, information flow, notification procedures in aviation and notification and coordination of the sectors involved .....	15
7	Summary and measures for consideration .....	17



# **1 Background for the proceedings of the working group**

GNSS (Global Navigation Satellite Systems) is a collective term for satellite systems in outer space that have a broad area of application, including in association with critical infrastructure. At worst, uncontrolled outage of such infrastructure can have disastrous consequences. Services provided by these systems include access to low-cost and accurate position, navigation and timing data. The US Global Positioning System (GPS) and the European Galileo system are examples of individual systems that are especially relevant in Norway.

Over a prolonged period in 2018, Norwegian aviation experienced GPS signal jamming from the Russian side of the border. Northern Norway was especially exposed, including during the NATO exercise Trident Juncture in the autumn of 2018. In light of the consequences for aviation, Norway raised the matter with Russia on a number of occasions, but this failed to change the situation. The phenomenon could thus not be assumed to be of a passing nature.

Against the background of the GPS disruptions, a meeting of state secretaries was held on 11 February 2019 in the Ministry of Transport, with representatives from the Prime Minister's office, the Ministry of Defence, the Ministry of Justice and Public Security/the Minister of Public Security, the Ministry of Foreign Affairs, the Ministry of Local Government and Modernisation/the Minister of Digitisation and the Ministry of Transport. It was decided at the meeting to appoint a working group at the civil service level to identify and assess threats and risks, consequences and management of GNSS disruptions, cf. the impact on the GPS system in particular. The working group was chaired by the Ministry of Transport.

## **1.1 About the working group and its mandate**

The basis for the deliberations in the working group has been the risk that GNSS disruptions represent for Norwegian aviation. The working group was tasked with assessing the vulnerability of the different sectors involved, the consequences of disruption/interruption of GNSS signals, potential damage in the short and long term, incident management, information flow and notification procedures in each sector, as well as notification and coordination across sectors.

Further emphasis was placed on revealing the root causes of vulnerabilities and thereby the potential for preventive action, and the potential for preventing/limiting incidents, including possible backup systems and alternatives.

The working group was also requested to submit, to the extent possible, assessments and propose solutions, as well as to report other issues that it identified during its work.

The working group was asked to submit its first report to the group of state secretaries in the autumn of 2019. It is important to clarify whether there are any measures for the follow-up of the working group's assessments, cf. the summary in Chapter 8 below. Any further work will thus depend on the issues that still need to be clarified.

Participants:

Ministry of Transport: Kirsten Ullbæk Selvig (chair), Øystein Haga Skånland

Ministry of Justice and Public Security: John Arne Gisnås, Per Erik Ringstad

Ministry of Local Government and Modernisation: Jarl Kristen Fjerdingby

Ministry of Defence: Trond Haande, Nina Borgen, (Hilde Kutschera Ravnstad)

Ministry of Foreign Affairs: Lars Ragnar Hansen, Tor Kinsarvik

The Norwegian Communications Authority (Nkom): Per Eirik Heimdal

The Civil Aviation Authority of Norway (CAA Norway): Svein Johan Pedersen

## 1.2 The proceedings of the working group

The working group has addressed the following main issues:

- The cause of the GPS disruptions that have occurred in Northern Norway and their handling in a short-term perspective.
- Vulnerabilities in aviation from the use of GNSS systems in critical infrastructure, risk assessments, possible preventive measures.
- How to prevent/limit unwanted incidents and their consequences, as well as backup systems and alternatives.
- Warnings and information flow in aviation and coordination between the sectors involved.

The basis for the work of the working group is aviation, but the group has also briefly discussed areas related to aviation, the consequences for these areas and their vulnerabilities. However, the working group's assessment is that these areas will require a large and comprehensive effort and should therefore be dealt with as a supplementary part of the group's work. The working group has concentrated its efforts on the immediate challenges to aviation and highlighted areas where there is a need for action to be taken.

To undertake technical and political assessments, cross-sectoral collaboration and possible measures, it is crucial to have a shared basis in the form of a joint picture of the situation, understanding of threats and roles, notification procedures and distribution of responsibilities.

The issues associated with GNSS disruptions are closely linked to the government's work on digital security and exemplify the vulnerability inherent in modern and critical infrastructure.