



TERMS OF REFERENCE

NAVAID Modernization Plan

NAV CANADA
Navigation and airspace
Level of Service
77 Metcalfe Street, 5th Floor
Ottawa, Ontario
K1P 5L6

January 2017

The information and diagrams contained in this Terms of Reference are for illustrative purposes only and are not to be used for navigation.

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1.0 Purpose

The purpose of this Terms of Reference (TOR) document is to initiate an aeronautical study to examine the proposal to decommission some non-directional beacon (NDB) and very high frequency omni-directional range (VOR) navigation aids (NAVAIDs) in support of NAV CANADA's plan to transition to a satellite-based (GNSS) air navigation system. A network of conventional NAVAIDs will remain to allow aircraft to land at a suitable alternate airport or continue to their destination in the event of satellite failure.

2.0 Scope of the study

This aeronautical study will assess customer needs, issues and concerns as they relate to the removal of NDBs and VORs across Canada that are not required for the provision of air navigation services or to support a recovery NAVAID network in the event of a catastrophic GNSS failure.

3.0 Background

The shift from NAVAID-based navigation to coordinate-based navigation enabled by performance-based navigation (PBN) provides significant benefits to NAV CANADA and its customers, in particular by providing the flexibility required to design airspace and associated routes and procedures according to operational needs.

The result is that many aviation users no longer use VOR and NDB for routine navigation over low frequency (LF) and VHF low-level (Victor) and high-level (Jet) airways and navigate safely using area navigation (RNAV) supported by GNSS, distance measuring equipment (DME) and inertial navigation.

The GNSS has been stable for enroute navigation since Transport Canada (TC) approved the system for navigation in 1995. However, for the near future, a subset of the ground-based navigation system infrastructure must be retained to provide a recovery network for the remote possibility of a catastrophic GNSS outage.

An analysis has determined that maintaining the current conventional NAVAID infrastructure imposes unnecessary costs to the ANS and is unsustainable in the long-term. Therefore, it is recommended that an aeronautical study be conducted to identify NAVAID sites for decommissioning.

4.0 Methodology

An aeronautical study assesses and analyzes information gathered through data collection and customer/stakeholder consultation.

The aeronautical study team will:

- Confirm stakeholder requirements for NDB and VOR in their area of operation;
- Analyze the concerns and issues raised by the stakeholders;
- Develop possible solutions and/or options;
- Conduct a HIRA as required;

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- Present recommendations to senior management for approval;
- Coordinate with the appropriate managers who would be involved with the technical and operational implementation of the proposed service change; and
- Coordinate with Transport Canada.

The study team will ensure that consultation with customers and affected or interested stakeholders is sufficient prior to making any recommendations to senior management.

The Study team will conduct the risk analysis and may call upon stakeholders to contribute to the assessment of some risk scenarios.

5.0 Safety Management Plan

The manager responsible for implementing any decisions resulting from this aeronautical study will prepare a project safety management plan. The plan will include mitigation and monitoring actions that are required to implement the change in service.

6.0 Human Resources

The team will be multi-disciplined with representation as required from key technical, operational and support areas. Where significant resources are required, this will be negotiated between the respective managers.

Team Leader: Manager, Level of Service and Aeronautical Studies

Other Team Members:

Managers, Level of Service and Aeronautical Studies
Specialist, Level of Service

7.0 Work Management Plan

TOR approval: January 2017

When conducting an Aeronautical Study, the following will be undertaken:

1. Develop Communication and Consultation Plan – January 2017
2. Study commencement – February 2017
3. Consultation – February/March 2017
4. Assess consultation input – April/June 2017
5. Conduct HIRA – June 2017
6. Finalize Aeronautical Study Report – July 2017
7. Management Approvals – August 2017
8. Circulate to Transport Canada for safety oversight review – August 2017

Following Transport Canada review

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9. Coordinate implementation plan and dates with appropriate departments – the implementation will be phased over several years
10. Prepare AIM Submission – as required based on phased implementation
11. Prepare and publish AIC – as required based on phased implementation
12. Prepare and publish Notice – as required based on phased implementation
13. Implement – phased over several years
14. Monitoring – Post implementation Reviews (conducted at post 90 days and 1-year at appropriate intervals based on phased implementation)

8.0 Finance Resources

Each responsibility manager is accountable for any travel and related expenses of the study team including the management of overtime.

Service design changes may generate an engineering support requirement. These requirements will be identified as the study progresses and an Opportunity Proposal (OP) generated to initiate project planning for implementing the engineering related recommendations from the study.

9.0 Materiality of the changes

There is the potential that some of the service delivery options may represent a material change. If this is the case, formal notifications as per the Civil Air Navigation Services Commercialization Act will apply.

10.0 Consultation

An appropriate communications plan incorporating a full consultation plan will be prepared.

Aviation organizations representing airport, general aviation, business aviation, airlines, and others as appropriate will be consulted during the Aeronautical Study.

A complete list of customers and stakeholders consulted will be attached to the aeronautical study.

11.0 Authority

Vice President Operations