


# ERTMS National Implementation

## Procedure for Trackside - OBU Compatibility verification

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# 1 INTRODUCTION

When introducing a new or modified ERTMS onboard unit (OBU) on the Norwegian rail network, or when changes are introduced in Trackside ERTMS, compatibility of OBU-Trackside has to be documented in order for an operator to put a vehicle in revenue operation. (See paragraph 1.4 in Appendix to «Forskrift om kjøretøy på jernbanenettet», FOR-2016-12-19-1846.)

The purpose of this document is to give interested parties a guideline and information on how to verify ERTMS OBU, including STM, compatibility in the Norwegian rail network.

Note that the procedure described in this document is distinct to the safety assessment necessary for obtaining NSA APIS for an OBU equipped vehicle. However, the process of obtaining an APIS and verifying compatibility according this procedure, might run in parallel.

## 2 PROCESS

The process for verification of ERTMS compatibility includes the following stages:

- Initiation
- Analysis
- Testing
- Post-testing activities

### 2.1 Initiation

The necessity of verifying compatibility might arise when:

- Rail vehicle with OBU is delivered for operation in Norway
- Rail vehicle with OBU operating in Sweden is anticipated for additional operations in Norway
- Existing rail vehicle operating in Norway is retrofitted in a way affecting TSI CCS performance
- Authorized OBU is modified

Either the rail vehicle operator, rail vehicle owner or OBU supplier, hereafter named stakeholders, shall notify Bane NOR if they consider it necessary to verify compatibility.

Notification shall be sent to «Kjøretøyteknologi» at [kjoretoyteknologi@banenor.no](mailto:kjoretoyteknologi@banenor.no).

### 2.2 Analysis

After contact is initiated, Bane NOR will facilitate a compatibility analysis meeting between the stakeholder(s) and Bane NOR.

Bane NOR will also provide an OBU compatibility test specification [1]

The analysis meeting's objective is to identify affected functions, where compatibility is yet to be verified.

The objective will be accomplished through:

- Identification of functions that might be impacted
- Study of function consequence
- Study of former compatibility verification in laboratory or on rail line

Prior to the analysis meeting, stakeholder shall submit to Bane NOR the following information:

- Rolling Stock Class and manufacturer
- OBU version and manufacturer
- Lines on where the rail vehicle is intended to operate
- Description of intended operation (passenger/freight/working machine)
- If available: Existing TSI CCS certificate with technical file
- If available: Information regarding identified compatibility issues from laboratory or operation

The following data will be used for the analysis:

- OBU compatibility test specification [1]
- Application conditions for trackside and OBU
- Configuration management (baselines, certification, etc.)
- Operational Scenarios
- Unisig Hazard Log (SS-113)
- Designers choice trackside
- Backward compatibility (BL3 OBU – BL2 trackside)
- Test results from compatible infrastructure

The analysis should result in a set of functions/operational scenarios where compatibility is not yet verified.

Functionality where compatibility has not yet been verified, shall be tested in lab or rail line.

## 2.3 Testing

Stakeholder decides whether tests shall be performed in laboratory or on the rail line.

### 2.3.1 General for testing on line

When ordering of test routes, Bane NOR's portal «BEST» shall be utilized. For further information see <http://www.banenor.no/kundeportal/ruter-og-sportilgang/>

If ERTMS operational scenarios shall be tested, a test plan shall be submitted to Bane NOR when ordering routes.

It is stakeholder's responsibility, if necessary, to obtain vehicle test and transportation authorization from the NSA.

Testing shall be based on operator's safety licence.

### 2.3.2 Line for ERTMS testing

Bane NOR manages one ERTMS equipped line, Østfoldbanens østre linje (ØØL), between Ski and Sarpsborg. In particular, the part of the line between Rakkestad and Sarpsborg is suitable for testing, as no commercial operations are scheduled on this part of the line.

ØØL is equipped with ERTMS level 2 from Bombardier Transportation. BL2.3.0d

For more information regarding ERTMS functionality, including national values on ØØL. See: <https://trv.jbv.no/wiki/Signal/Prosjektering/ERTMS>

All regulations applicable for operation on ØØL applies. See: <http://orv.jbv.no/orv/doku.php?id=teo:start>

### 2.3.3 Line for STM testing

For testing of STM see:

[https://trv.jbv.no/wiki/Rolling\\_stock/Supplementary\\_information\\_and\\_regulations#Requirements\\_for\\_STM](https://trv.jbv.no/wiki/Rolling_stock/Supplementary_information_and_regulations#Requirements_for_STM)

All regulations applicable for operation in the Norwegian network applies. See: <http://orv.jbv.no/orv/doku.php?id=tjn:start>

### 2.3.4 Laboratory

Bane NOR will not provide access to any test facilities, but will supply contact information for trackside suppliers test facilities upon request.

## 2.4 Post-testing activities

Stakeholder shall document test results in a test report.

Stakeholder shall expeditiously submit the test report to Kjøretøyteknologi at [kjoretoyteknologi@banenor.no](mailto:kjoretoyteknologi@banenor.no).

If testing is done on the basis of a test and transportation authorization from the NSA, the test report shall also be submitted to the NSA.

Both Bane NOR and stakeholders can request a post-testing meeting to analyse test results and discuss the necessity of implementing remedying actions.

## 3 BANE NOR'S RESPONSIBILITIES AS INFRASTRUCTURE MANAGER

### 3.1 Infrastructure condition

Bane NOR will provide knowledge of infrastructure signalling conditions.

### 3.2 Participation in compatibility verification process

#### 3.2.1 Routes

Bane NOR will provide access to lines for testing.

#### 3.2.2 Test cases

Based on ERTMS infrastructure conditions, Bane NOR has developed a set of test-specifications, which describes tests and expected return of results. [1]

#### 3.2.3 Analysis meeting

Bane NOR will provide infrastructure signalling competence and arrange for meeting at Bane NOR premises.

#### 3.2.4 Dispatcher

Bane NOR will provide a dispatcher dedicated for testing.

### 3.3 Cost

Bane NOR will cover the cost related to the use of Bane NOR resources.

## 4 DOCUMENT INFORMATION

### 4.1 Document change history

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00E	Issued for implementation	01.09.2017	XOVLASI

### 4.2 Terminology

OBU	ERTMS Onboard Unit
NSA	National Safety Authority (Statens Jernbanetilsyn)
APIS	Authorisation for placing in service
ØØL	Østfoldbanens østre linje

### **4.3 Reference list**

- [1] ERP-00-Q-00054 Norwegian Trackside - OBU compatibility test specification