



FOLKETINGET
STATSREVISORERNE



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Banedanmark's management of shortage of validators

1. Introduction and conclusion

1.1. Purpose and conclusion

1. This report concerns how Banedanmark, which is a governmental body under the Danish Ministry of Transport with responsibility for maintaining the Danish railway system, has managed the shortage of validators. Validators are essential for the implementation of railway projects. The study was initiated at the request of the Danish Public Accounts Committee in November 2020.

2. A validator is an engineer or technician with expertise in rail signalling who ensures that planned changes to the railway system are in compliance with current regulations and requirements, before they are implemented. Errors in the control systems can lead to accidents, and all planned changes to the control systems should therefore be validated. Basically, validation has to do with the passengers' safety.

In 2001, Banedanmark divested the consultancy arm of its business to a private, consulting engineering company. The consultancy division included also a number of validators. Since the divestment, Banedanmark has therefore engaged external consultants to provide validation services.

Banedanmark is now experiencing a shortage of validators, primarily due to the delay and rescheduling of the Danish signalling programme. The delay has made it necessary to extend the life of the old signals, and Banedanmark is therefore forced to carry out more railway projects that require implementation of changes to the old control systems. However, this also has the consequence that the services of validators with knowledge of the old control systems will be required for longer than originally planned. The shortage of validators is aggravated by the fact that only a few validators are familiar with the old control systems, and some of these validators have reached or about to reach their retirement age within the next few years. The shortage of validators has made it difficult for Banedanmark to carry out its projects as planned.

3. The purpose of the study is to assess whether the Ministry of Transport has managed validation resources in a manner that ensured that the planned railway projects could be implemented. The report answers the following questions:

- Has Banedanmark secured a satisfactory overview of whether the demand for validation resources in the planned railway projects can be met?
- Has Banedanmark made a satisfactory effort to ensure the availability of the validation resources required to implement planned railway projects?

The study looks at the period from the first rescheduling of the signalling programme in October 2016 up to and including the second quarter of 2021.

Control systems

Railway control systems control railroad switches and signalling. The control systems contribute to reducing the risk of train collisions. Many different types of railway control systems are in use in Denmark and abroad. Most of the control systems were installed in the 1950s and 1960s.

The Danish signalling programme

Banedanmark is replacing the current signaling system with new electronic signals. Originally, the signaling programme should have been rolled out by 2021, but it has been extended to 2030.

Railway project

Railway projects include construction of new stations and sections, refurbishing or improvement of the current railway in the form of new tracks, electrification or rollout of new signalling technology.



Main conclusion

The Ministry of Transport has not managed validation resources in a satisfactory manner that ensured that the planned railway projects could be implemented. As a consequence, Banedanmark has been forced to postpone and cancel planned railway improvements.

Banedanmark has not secured a satisfactory overview of whether the demand for validation resources in the planned railway projects can be met

The study shows that Banedanmark only late in the process secured an overview of whether the overall demand for validation services could be met. Banedanmark did not secure an overview of required resources up to or immediately after the rescheduling of the signalling programme in November 2017. In the autumn 2018, Banedanmark provided a first overall overview, which showed that it would be necessary to postpone projects. On several occasions, Banedanmark's updates of the overview showed that the shortage of validators was considerably greater than previously anticipated. The reason was that the demand for validation services repeatedly turned out to be considerably greater than expected. As a result, Banedanmark has been forced to postpone more projects and cancel the planned immunisation of the section between the cities of Roskilde and Holbæk.

Banedanmark has not based its overview on well-founded estimates of the demand for validation services in the individual projects, during the period covered in this report. Until January 2021, Banedanmark's estimates were based on in-house assessments and estimates provided by suppliers. Often, the estimates deviated significantly from the actual validation resources used. Since January 2021, Banedanmark has adopted a new and more systematic approach to estimation.

Currently, Banedanmark has an overview of whether the future demand for validation services can be met. Banedanmark has secured a detailed overview up to and including 2022 and a less detailed overview up to and including 2023. Additionally, Banedanmark has sent an overview to the Transport Committee under the Danish parliament that covers the period until the end of 2025. In this overview, Banedanmark has included the effect of improvements that was based on undocumented estimates. Rigsrevisionen finds that Banedanmark should have indicated more clearly that the effect referred to in the overview was based on an assessment.

Banedanmark's effort to ensure the availability of the validating resources required to implement planned railway projects has not been entirely satisfactory

The study shows that Banedanmark has not taken steps to optimise the validation process as planned. In 2017, Banedanmark decided to launch a number of initiatives to reduce the demand for validation in individual projects and permit other groups of staff to assist the validators. However, these initiatives were not launched till 2019 and 2020. Additionally, Banedanmark, in the autumn 2018, set up a validation unit with responsibility for coordinating the allocation of validation services across the range of projects.

Immunisation

Immunisation protects the existing old signals from unwanted electrical interference from the new wires. Immunisation makes it possible to deploy electrical trains, before the new signals have been rolled out.

In connection with the second rescheduling of the signalling programme, it was decided that the section between Roskilde and Holbæk should be protected from electrical interference.

Banedanmark has to a certain extent ensured training of new validators. In 2018, Banedanmark approached the suppliers of validation services in order to establish a co-operation on training validators, but nothing came of it. Instead, Banedanmark started training its own validators in 2019. However, Banedanmark's internal training programme has attracted only a few participants and led to few new certifications.

Banedanmark has to some extent also ensured that more validating resources have been available for its projects. Banedanmark and the suppliers have not succeeded in reaching any long-term agreements on validating resources. Banedanmark has entered an agreement with the suppliers on validating resources for the remainder of 2021 and 2022. Banedanmark has ensured the availability of more internal validating resources, but not to the extent planned.