



End-to-end Maintenance Management of Major Bridges and Tunnels using the Internet-based DANBRO+ System

John Bjerrum

Senior Bridge Engineer
The Danish Road Directorate
Copenhagen, Denmark
job@vd.dk

Jens Kristian Tuxen

Bridge Engineer
The Danish Road Directorate
Copenhagen, Denmark
jkt@vd.dk

Bjørn Nordgaard Lassen

Chief Consultant
Rambøll Denmark
Copenhagen, Denmark
bl@ramboll.dk

Finn M. Jensen

Civil Engineer
Rambøll Denmark
Copenhagen, Denmark
fni@ramboll.dk

Summary

This paper presents DANBRO+, which is an Internet-based client-server system, tailor-made for handling of all activities such as routine, principal and special inspections together with all maintenance, rehabilitation and repair activities on major bridges and tunnels. DANBRO+ has been developed during 2003-2006 and will be used for all operation and maintenance tasks related to the 40 major bridges and traffic tunnels administered by The Danish Road Directorate beginning in the spring of 2007. The system is based on 30 years of experience with systematic maintenance of major structures and 20 years of experience with the DANBRO system for minor bridges. DANBRO+ has been designed to support all management levels of the bridge owner's organization as well as consultants, contractors, suppliers and others participating in the operation and maintenance of the structures.

Keywords: Systematic maintenance, bridge management, major bridges, tunnels, internet-based system, DANBRO+

1. Introduction

The Danish Road Directorate (DRD), Ministry of Transport and Energy, uses modern technology to construct roads and bridges that meet Denmark's transportation needs and provide a well-functioning infrastructure, adapted to the requirements of citizens and road-users. The DRD is responsible for the national road network with over 2000 ordinary bridges and 40 special bridges and tunnels on this road network. Special bridges are defined as large bridges either on land or over water or more complicated structures such as traffic tunnels and bascule bridges. The main focuses of attention for the DRD are on safety, preservation of invested capital and availability of an uninterrupted traffic flow and a continuous reduction of total operation and maintenance costs. The DRD decided in 2002 to develop a new computer based management system for large bridges and tunnels. This new system – DANBRO+ – comprises tools supporting the daily and yearly task and administrative flow within the DRD, which will result in a more efficient daily administration where the management tasks are solved more effectively. The decision to develop a tailor-made management system – and not to adapt an existing standard system – was based on an evaluation of several standard administration and management systems. The conclusion of this survey was that no standard system covered more than approximately half of DRD's needs and requirements.