



Movable Bridges and Rolling Gates Design, Maintenance and Control Lessons Learned from experience

Background

Movable Bridges and Rolling Gates are located throughout the world. A number of different bridge and gate types are utilized for navigation structures with their own unique design features. A variety of mechanical/electrical or other systems are used to operate these bridges and gates. Two typical methods are hydraulic cylinders or electrically operated gear driven machinery.

Some of the design considerations for selecting operating machinery include the type of bridges and the former design of rolling gates, loading conditions, site conditions, operations, maintenance, and operator preference.

A number of mechanical/electrical design manuals and guidance exist for bridge and lock operating machinery. However, informations on comprehensive "lessons learned" from actual installations are limited. Problems with mechanical /electrical systems quickly emerge causing expensive unscheduled closures and downtime. A comprehensive "lessons learned" on navigation bridges and rolling gates will help facilitate the design of new construction or rehabilitation, and in troubleshooting existing operational and maintenance issues, based on the investigations, recommendations and the report of WG 138 "Mechanical and Electrical Engineering Lessons Learned from Navigation Structures".

Objective of the Working Group

Establish a working group of mechanical, electrical and constructive engineers to assemble "lessons learned" from navigation bridges and rolling gates and their operating systems and to give recommendations for future design.

Final Product

The intention will be to provide a comprehensive summary of design solutions, lessons learned, best practices and recommendations that can be incorporated into future bridge and rolling gates operating machinery and constructive designs. The report will include a summary of relevant guidance documents from various countries. The working group will provide guidance on the choice of systems to use in future designs for navigation structures.

Matters to be investigated

The report will use Case Studies to compile lessons learned on hydraulic machinery, electro-mechanical machinery, electrical control systems, construction elements and design and determine best practice to improve economic efficiency, reliability and thus availability. Some of the issues that could be investigated include:

- Troubleshooting – Difficult for bridge and lock personnel to troubleshoot is complicated.
- Exterior Mounted Components – Vulnerable to sun, water, flooding, environmental and historical conditions.
- Custom designed drive elements and other components with long lead times for service and delivery.
- Possibility of impact damage on machinery connections to the bridges and gates
- Labor intensive maintenance.
- Different control systems

The Working Group will review all areas of concern and prioritize them to prepare a shortlist of matters of critical concern to navigation operators and engineers and develop its report accordingly.

Desirable Background or Experience of Working Group Members

The background and experience may include the following:

- Mechanical/Electrical Design engineers
- Engineers of mechanical constructions and design
- Lock operators
- Lock maintenance personnel
- Supply Industry representatives

Relevance for Countries in Transition

Lessons Learned on experiences of movable bridges and rolling gates in navigation structures and design recommendations for future new constructions are relevant for all countries, including Countries in Transition.