



Innovative solutions

Royal HaskoningDHV delivers specialist design and consultancy services for major coastal and inland maritime projects in the UK, Europe and across the world.

Our control engineering team work closely with clients to meet project objectives, achieve the most cost effective solution and deliver added value wherever possible. We provide technical expertise for the whole life cycle and aim to build long term working relationships through the mutual exchange of knowledge and experience.

We undertake projects and activities in the following sectors:

- Container terminals
- Passenger and vehicle terminals
- Liquid bulk terminals
- Dry bulk terminals
- Naval base and defence facilities
- Shipbuilding/ship repair yards and dry dock facilities
- Moveable bridges, dock and lock gates, weirs, sluices, dams and pumping stations
- Water control structures
- Pumping stations

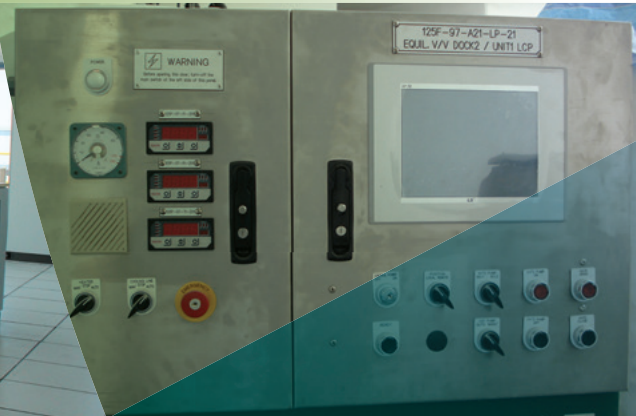
Our experts have extensive experience in the specification and design of Instrumentation, Control and Automation of equipment and moveable structures including:

- Ro-Ro linkspans and ship to shore passenger walkways
- Lift and swing bridges
- Dock and lock gates (inland and coastal), including sluice controls
- Winches, capstans and hauling machinery
- Flood barriers, weirs, penstocks, sluices
- Pumping machinery including continuous operation and on-demand systems such as flood alleviation schemes

Our work includes: inspecting existing equipment; developing feasibility studies; concept, basic and detailed design; installation supervision, testing and commissioning; fault finding and review of operational and maintenance documentation. We can also specify the supervisory control and data acquisition (SCADA) equipment requirements. Our experts provide specification and design services for security systems, CCTV, access control systems, SCADA and PMS including the associated network infrastructure.

Our wide ranging, multidisciplinary experience of maritime projects enables us to excel in the efficient integration of the control system with the machinery design.

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Our established 'risk based approach' to control system design means our solutions need little or no modification as the project progresses. We use assessments and workshops to identify risks very early in the project life cycle and eliminate or reduce them to acceptable levels. If mitigation falls to the electrical control and monitoring system we identify the required safety performance levels in line with international standards and client requirements.

This approach enables us to target specific equipment performance requirements for the fundamental control functions identified and reduce failure rates during operation. The approach also identifies any vulnerability to component failure and its consequences at an early stage so remedial cost effective design improvement can be made.

Our considerable knowledge of UK, European and international machinery safety legislation and design standards enables us to prepare designs and specifications in accordance with appropriate standards including:

- BS EN ISO 13849 Safety of Machinery – safety related parts of control systems
- EN IEC 62061 Safety of Machinery – functional safety of related electrical, electronic and programmable electronic control systems
- IEC 61508 Functional safety of electrical/electronic/programmable electronic safety-related systems

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