

Vessel Traffic Management



Cardno provides a range of independent services to Ports and Maritime Authorities in the fields of Vessel Traffic Service, Vessel Traffic Management Systems, Vessel Traffic Management Information Systems and Port Management Systems. This work, and system implementation, provides safe navigation and operation of Ports and Waterways.

Key Services

Assessment, Business Requirement and Recommendation

Assessment of requirements

Cardno works directly with relevant organisational personnel and external agencies in undertaking detailed assessments of operational as well as integrated business requirements. These assessments can include:

- > Review site requirements / approvals processes and timelines and assist clients with preliminaries
- > Site investigations and preparation of geotechnical briefs for tower requirements
- > Organisational requirement for VTS/VTMS/VTMIS/PMIS and related business and safety systems including necessary integration with existing systems (particularly financial)
- > Traffic densities and navigational complexity leading to establishing an agreed capability level
- > Risk Assessment to determine the level of service and impacts on future procedures and training
- > Review timelines and budget expectations against business requirements
- > Identify associated system requirements or options (work particularly with ICT for networking limitations and / or external data communication links, phone systems, and interaction with any external organisation requirements
- > Identify the Head of Power (legal basis) for any VTS/VTMS/VTMIS operation and engagement with adjacent regions or Competent Authority
- > Identify system delivery options including funding arrangements / options and ongoing support and maintenance
- > Identify procurement options (i.e. EOI, RFT, Select Tender, Operating Lease, Capital Purchase etc) including benefits of turnkey project versus separable deliverables, and agreed vendor list for invitational purposes

- > Particulars of contract
- > Identify realistic and measurable VTMS objectives

The culmination of the above assessments is generally preparation of an agreed Business Requirement Report

Specification & Tender / Bid Documents

Prepare detailed specifications allowing high level of control during contract and commissioning and ensuring alignment with agreed system objectives and performance requirements (including range and redundancy considerations).

The specification would be prepared with necessary reference to IALA requirements as well as other internationally relevant endorsement requirements for equipment. As part of generally turnkey project delivery, the specification & contract is prepared so that it defines key responsibilities for the Prime Contractor / System Integrator. This is important as vendors often have to acquire equipment from different sources and integrate with the system software suite.

Similarly, in reference to any turnkey delivery, the specifications will then make necessary allowance for future maintenance requirements and spare parts provisions to provide client confidence that equipment availability can be achieved and therefore that the safety and efficiency objectives are realised.

Cardno uses its experience to guide clients through this stage with respect to advantages or risks associated with their preferred funding model and future / ongoing service level agreement requirements.

Technical Evaluation / Assessment, Report and Presentation

Cardno often provides assistance with technical evaluation / assessment of bids whether we have prepared the specification or not. Even in the latter case, we can often draw out critical issues for clarification and confirmation prior to any award process. We have experience running this process entirely or as an adviser to an evaluation committee or panel.

Unfortunately, our experience has shown that vendors will often make compliance statements regarding key equipment without actually satisfying requirements and therefore fail to meet operational objectives and target detection requirements of the system. As such, we scrutinise technical deliverables including equipment capabilities, sometimes independently of what vendors have provided. Similarly, any structural element are reviewed together with appropriate warranties to ensure longevity of infrastructure.

As well as undertaking technical assessment, as part of any tender evaluation, it is necessary to also assess the vendors' capacity to deliver the project (financially and technically) including existing project commitments they might have.

Any particular project supervision outcomes associated with the vendor (i.e. subject to where equipment is sourced, any associated travel for

Acceptance Testing and impacts on the initial Technical Requirement timeline and / or costing) are identified for client consideration.

Project Management

Typical Project Management tasks that Cardno provides in these projects include:

- 1. Preliminary Design Review (PDR)**
- 2. Critical Design Review (CDR)**
- 3. Factory Acceptance Testing (FAT)**

As equipment is prepared / configured to the client requirements, it is tested in the factory and is normally approved at that point prior to sending to site for installation. This is generally preceded by FAT documentation that is reviewed to ensure testing is satisfactory in order to provide certainty of system configuration and operation requirements.

This is a key opportunity where Cardno can work independently or with the client to ensure that all equipment is as specified, is performing as required and provides a detailed record for comparison when arriving to site..

- 4. Site Acceptance Testing / Commissioning (SAT)**

The site acceptance testing is the opportunity to ensure that all equipment is performing as it did in the factory environment and, most importantly, that it is providing the range and target accuracy as specified.

During this stage Cardno generally provides specific advice regarding SAT documentation and during testing, including requiring a range of environmental conditions and vessel densities to be tested for confidence in tracking systems and range of relative equipment.

It is in this stage in particular that testing and commissioning of any integration with existing systems is usually undertaken.

- 5. Training**

All initial training material is generally reviewed by Cardno as well as providing oversight to the actual training. Our experience has shown that vendors are very good at providing systems but lack expertise in delivering training on systems. Similarly it is important, for operators in particular, that a level of competency assessment is undertaken. Cardno generally oversee training of key client representatives (i.e. ICT in particular) for local level support needs.

- 6. Procedures**

In addition to equipment requirements, the successful implementation of the VTS/VTMS/VTMIS systems rely on satisfactory standard operating procedures (SOP) being in place. So that VTS / VTMS/ VTMIS services are the same for shipping at all ports, IALA based procedures are often developed and in some cases are required for approval by a Competent Authority. Cardno specialists have undertaken this development and associated training in SOP's for many of our clients to date so can achieve this efficiently.

Cardno's Commitment to Zero Harm

Safety is a core value at Cardno and our Zero Harm safety program fosters an environment of clear accountability, shared responsibility, risk awareness and effective communication. Our program underpins all operations and is responsive to the needs of our clients. We are focussed on continually improving our safety culture and the management systems that reinforce our commitment to zero harm. Cardno operates an occupational health and safety management system that has been certified to AS4801 and OHSAS18001.

About Cardno

Cardno is a professional infrastructure and environmental services company, with expertise in the development and improvement of physical and social infrastructure for communities around the world. Cardno's team includes leading professionals who plan, design, manage and deliver sustainable projects and community programs. Cardno is an international company listed on the Australian Securities Exchange (ASX: CDD).



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