Port Collaborative Decision Making

Making port calls more predictable can improve the experience for ships' Masters and ship operators alike

Mikael Lind, Michael Bergmann AFNI, Robert Ward
Research Institutes of Sweden (RISE),

Jillian Carson-Jackson FNI
The Nautical Institute

How many times have ships been delayed and not arrived at a port at the allotted time? How many times does a ship arrive at a port which is not ready to serve the ship when it does arrive? In many cases, the issue arises because not all parties are aware of the delays in time to take remedial action and save on the unnecessary use or deployment of resources.

Port Collaborative Decision Making (PortCDM) aims to improve this by enabling captains, ship operators, ports and the other parties involved in the marine transportation chain to keep each other informed of progress and take appropriate actions as soon as any delays or changes to the existing plan become known.

Informed by the aviation sector (AirportCDM), Port Collaborative Decision Making (PortCDM), as an enabler of the Sea Traffic Management (STM) concept, is being brought to the maritime sector to enhance port operations. Benefits of PortCDM include meeting the demands from shipping companies for improved just-in-time arrivals and departures, as well as faster turn-around during port visits. This is of particular relevance in the context of delivering efficient and environmentally sustainable sea transport. PortCDM aims for closer integration between sea operations and port operations through shared and common situational awareness
.

Developing the concept

The MONALISA and the STM Validation Projects, sponsored by the European Commission, have been used to define, validate, and disseminate the PortCDM concept. The PortCDM concept builds upon universal standards for data sharing that are part of the common maritime data structure (CMDS) – a key factor in IMO's vision for e-Navigation. With the support of IALA and the International Electrotechnical Commission (IEC), the port call message format (PCMF) and the route exchange format (RTZ) enable all involved parties to share situational awareness of the progress of key events in the marine transportation chain with a focus on port call activities. A number of PortCDM concept notes have been published by Fathom World (to be found at www.ipcdmc.org) to highlight the operational and business improvement opportunities emerging from enhanced data sharing related to port operations. A section of one of these notes appears in the box below.

> 66 Under PortCDM, as plans and progress changes, it should be possible to trigger automatic alerts to those affected further along the marine transportation chain, so that they can take appropriate action. 99

An example in practice – short sea shipping

Short sea shipping is particularly challenging because of the short horizon for the planning of operations. PortCDM can assist by supporting the exchange of standardised messages between neighboring ports.

The STM validation project identified a desire for the next port in line to know about the progress in the previous port and also to know about the status in the next port in a sequence of port visits. Special focus is directed towards the provision of timestamps of the estimated and actual time of departure from the previous port visit (ETD, ATD) and the estimated time of arrival (ETA) to the next port. When accurately communicated between ports, these timestamps can form the basis for better coordination of the port call activities at the port of destination, especially when there is only a short distance between the ports.

Equally important is to continually track the vessel at sea, either by continuous ship-2-port communication or by other means of tracking, once the voyage begins. Ship-2-port communication within STM is enabled through the exchanging of voyage plans in a standardised format between the ship and the destination port. At this point we should emphasise that the various decisions made at the previous port are just an information component contributing to situational awareness. It is always the captain of the ship who decides when to leave berth.

For this vision to become reality the ports and ships have to be able to communicate by digital means in a common language. STM addresses this need by promoting information services using standardised data exchange formats (eg the route exchange format (RTZ) and the port call message format (PCMF)).

What is PortCDM?

PortCDM is an organisational concept. It is aimed at enabling more predictable timings and operations in sea transport by building on unified and standardised data exchange protocols. PortCDM addresses the need to ensure a continuous flow of data about intentions, outcomes, and possible disruptions related to movements and service provision among all those involved in the berth-to-berth maritime transport process. This results in a high degree of predictability in the planning and execution of all associated operations and activities.

PortCDM enables all the actors to share the same situational awareness based on input from multiple sources. Under PortCDM, as plans and progress changes, it should be possible to trigger automatic alerts to those affected further along the marine transportation chain, so that they can take appropriate action. The availability of such a holistic view enables and fosters collaboration. In turn, this enables efficient and successful coordination and synchronisation, which benefits everyone, not least the end customer or recipient of the goods being transported.

How does it work?

As far as possible, the exchange of the information that underpins the PortCDM concept is achieved automatically using existing equipment as part of the ever-increasing shift towards a digital data environment at sea. A combination of equipment can be used onboard ships to ensure a solid flow of communication between a ship and its dependencies. This includes ECDIS equipment, onboard computers and tablets/mobile phones. Cyber security is addressed throughout the exchange of data. A simple demonstrator provided via GooglePlay and Apple IOS was used in the STM validation project to provide ships' captains with situational awareness related to their port visits (see screenshots below).

The PortCDM process is intended to be dynamic and transparent through the use of standardised messaging and interfaces that trigger and prompt the various actors to review exception alerts and take actions based upon their physical capabilities, preferences, and requirements. Provided everyone is kept informed, multiple revisions or iterations to plans can take place during a single port call while at the same time minimising the overall disruption to the final outcomes.

PortCDM does not call for process changes but focuses on a more dynamic and effective delivery of the existing processes through greater collaboration and the availability of high quality, near real-time data

to all the relevant and authorised actors in the maritime transportation ecosystem. PortCDM will be underpinned by appropriate protocols to ensure robust data integrity and access control.

When will it happen?

The International PortCDM Council (IPCDMC) has been formed to cater for the emergence of the PortCDM concept on a global level. The IPCDMC provides guidelines for the global governance of PortCDM that should be implemented at regional and local levels. Because PortCDM is a scalable concept, one of the tasks of the IPCDMC is to maintain a PortCDM framework for maturity levels. This will enable all actors to know how well advanced each port is in embracing PortCDM and what level of information service it can support: from the exchange of basic information at Level 1, to Level 6 or 7, where all the stakeholders represented in a port have agreed to use PortCDM for optimal planning of port calls.

The ultimate goal is to enable the ships' Master, the ship operator and other shore authorities to connect to ports that have adopted the PortCDM standardised interfaces to enhance situational awareness of the plans and progress of forthcoming port operations. The journey towards more globalised and harmonised data sharing has just started.

More information about PortCDM can be found at www.ipcdmc. org or www.stmvalidation.eu, or from:
- Mikael Lind, Research Institutes of Sweden, Mikael.Lind@ri.se
- Michael Bergmann AFNI, FRIN, Research Institutes of Sweden & BM Bergmann-Marine, Michael.bergmann@bergmann-marine.com