

## **V-MAX P-MAX**

### **What does it take to make super-safe tankers and what technology do they need? Barry Parker tells the story of Concordia Maritime of Sweden and its V-MAX, C-MAX and P-MAX tankers**

The "MAX" concept is the brainchild of Stena-Teknik, an in-house technical design group at Concordia Maritime. It represents a new paradigm for shipping where a combination of environmentalism and built in durability also represents good business.

The MAX concept involves built in redundancy throughout the propulsion and maneuvering systems, including two main engines in two completely separate engine rooms (with a watertight firewall in between), double rudders and steering gear, two propellers and duplicate control systems.

The vessels are completely double hulled with extra deep hopper tanks (where sides meet bottom), an additional measure towards accident prevention.

The vessels were designed to be wider, allowing for shallow drafts (relative to other vessels w/ comparable dwt), giving the benefits of greater cargo deliverability on a given draft. The V-MAX transport VLCC cargo on a Suezmax draft.

The VMAX story began in late 1998 when Concordia / Stena signed a contract with the Hyundai shipyard for the construction of two 314,000 dwt VMAX tankers initiating a design phase that lasted eighteen months. Construction on the first unit began in July 2000, with a launching in January 2001.

The "Stena Vision" delivered in April 2001, followed by the "Stena Victory" during Summer 2001, both moving crude oil from West Africa into the Delaware River area (near Philadelphia) under three year charters to Sunoco (formerly Sun Oil Company). The V-MAXes were followed by two 10,000 dwt. "C-MAX" chemical carriers (Polish built, in Caribbean trade), and six 49,900 dwt. "P-MAX" vessels set to deliver in 2005 - 2006 (to be built in Split, most likely for loadings in the Black Sea and Baltic Sea).

#### **Concordia's background**

Concordia's background in extra high specification tankers goes back to the last great tanker boom, lasting from 1967 to the oil embargo of late 1973, was an era when great shipping fortunes were made.

D.K. Ludwig's Universe Tankships, built in that period, gave new meaning to the word supertanker, developing a reputation for infusing both advancing technology and first class operation into tanker shipping later in conjunction with Gothenburg-based Stena. In the quality leagues at that time, large deadweight and thick steel were the differentiators.

Twenty years after Universe's pioneering practices, the words "quality shipping" joined the industry's lexicon, as the Exxon Valdez grounded at Bligh Reef in March 1989.

Five years prior to the shipping equity boomlet occurring at the same time, Stena had floated the listed entity Concordia Maritime.

In 1989, Concordia (floated in 1984), continued to coalesce around the purchase of six immaculately maintained Universe vessels (renamed "Concordia" series) that had traded under charters to oil major Texaco, plus two ULCC's originally designed by Universe in the 1970's.

The Exxon Valdez fundamentally changed shipping. By the mid 1990's, when Concordia purchased Universe Tankships, the Oil Pollution Act of 1990 (OPA 90) and analogous IMO actions, memorialized notably in Regulation 13G, single hulled VLCCs, not designed with protective ballast spaces, were slated for phase-out by 2005. Charterers saw more double hulled tonnage availability in the 1990's, as many early 1970's single hull units were scrapped.

Concordia's vessels continued to trade, with their hefty steel thickness affirmed by top ratings in the Condition Assessment Programs (CAP) introduced by major Class Societies. As the OPA 90 and IMO 13G timelines were ticking, Concordia looked in two directions- life extensions and fleet renewals.

New life was brought to a number of Concordia Class vessels, by conversion into Floating Production Storage and Offloading vessels (FPSO), rather than scrapping. Always in tune with broader industry trends, Concordia's fleet renewal strategy recognized that customers, along with other stakeholders in the movement of crude oil and products, were demanding heightened avoidance of risk.

Planners in the Stena organization also realized that simply building vessels with the now mandated double hull standards would not form a complete solution. Indeed, the mission of operating companies Stentex and Stenabulk (with vessels under the Universe technical management banner) addresses issues of safety, environmental friendliness, and competitive cost.

### **Computer based training**

Two years before delivery of the V-MAX vessels, owners (Concordia) / manager (Universe) and the charterer (Sun Oil) joined with the Delaware River pilots to organise a training program for managing port calls of these vessels.

It was conducted on the advanced 360 degree simulators at the RTM-Star Center, in Fort Lauderdale, Florida, best known for training cruise ship crews and pilots, led jointly by a Delaware River pilot and a Ship Master.

The actual training sessions, using a bespoke computerized model of the vessels dimensions/ shape/ and propulsion, against a background depicting the very narrow Delaware River, began in December 2000.

### **Shipboard IT**

The V-MAX 's CAE Hitec bridge system is probably "the most advanced found on any VLCC in the world", according to Mr. Björn Sodahl, Concordia's Quality and Safety Manager, who says that its specialized design draws on Stena Teknik's experience in bridge systems for Stena's High Speed ferries.

The vessels feature an integrated bridge where multiple information is available on large screens in the bridge, including ECDIS with ARPA radar and AIS overlay.

Especially noteworthy is the integration of cargo control and machinery monitoring, directly from the bridge. The C-MAX vessels are fitted with Siemens / Raytheon navigation / automation systems.

The mantra of accident prevention through redundancy extends to bridge resource management where two consoles may show the same views, perhaps to a ship's officer and to the pilot. The computer network itself is redundant, with dual uninterruptible power supplies. The consoles' dual display capability also facilitates training of crew, or working out resource management issues with pilots.

Valmarine, also a division of CAE Corporation, provided the Damatic II ship automation system, where disparate systems can be linked. On the smaller C-MAX vessels, fiber optic cabling provides the glue.

CAE is known for automation and integration of complex military shipboard systems and systems on cruise ships such as the newly launched Queen Mary II, but Damatic systems are also on vessels for Stolt, Ceres Hellenic, MISC and BHP, in addition to the Stena High Speed craft.

The engines, from manufacturer MAN B&W as "intelligent engines" represent technological advancement while offering environmental friendliness.

The V-Max vessels are equipped with Nera Sat B, complemented by a Nera Mini M which the crew uses for prepaid calling. Messaging is handled using MS Outlook, with data routed to the Sat B through the Rydex RMX package. The advanced technology of the V-MAX's is evidenced by Hitec's ability to connect through the Sat B, for remote diagnostics and trouble-shooting.

## **Risk Alert**

The V-Max vessel paradigm extends to proving a recurring theme presented in The Digital Ship, that security and supply chain have many indistinguishable elements. Delaware River Maritime Enterprise Council (DRMEC), a non profit group based in Philadelphia, conducted "Risk Alert", a demonstration project during 2003 funded largely by the Transportation Security Administration's Round 1 of Port Security Grants.

In the "Risk Alert" implementation, the Transentric portal, originally developed by Union Pacific Corp. to provide shippers with visibility into railway supply chains, was adapted to feed security related information to local police, but also to the Federal Bureau of Investigation, US Customs, US Coast Guard and local police, as a voyage progressed.

The Philadelphia area, a hub for military shipments, also contains multiple refineries and chemical plants, and the security vulnerabilities associated with such facilities. The participation of the V-MAX vessels was not accidental, given a long term contract and frequent port calls at two Sunoco facilities south of Philadelphia: the terminal complex at Fort Mifflin and the refinery at Marcus Hook.

The Transentric application supported multiple inputs concerning inbound voyages, and it also enabled alert information to be sent to recipients (in this case Federal agencies and local law enforcement), if a specific milestone occurred, such as the shipment moving within 50 miles of downtown.

The RISK Alert screen included an embedded tracking record using the PurpleFinder application (borrowing from fleet management and CRM practices at Oldendorff, P&O Nedlloyd, and many others).

Technology will continue to play an important role in commercial shipping. Maritime security can only sharpen the focus of outsiders on vessel operations, with the V-MAX vessels showing both insiders and outsiders the new definitions of "quality shipping". As shoreside interests such as DRMEC place themselves into information loops previously reserved for fleet managers or logistics managers, charterers may be looking much more closely at each vessel's communications capabilities, and the ability to easily interface a vessel with a land-based hub application.