Safeport

On-board visualization of hydro-meteorological effects on ferries entering and berthing the Port of Gdynia, Poland

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Ship Design and Research Centre

NIVA, Oceanography
Marine Modeling

Sprint
Maritime Safety Information Exchange System

Aanderaa/Xylem

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Port of Gdynia
Gdynia Harbour

- Second largest in Poland
- One of the largest in the Baltic Sea
Gdynia Harbour

- In Gdansk Bay
- No tides
- Relatively low currents
- Occasional strong and irregular winds
- Wind driven surface currents
Strong Wind pushed Ferry onto Breakwater
Winter conditions with occasional ice
Topography adapted model used for simulating and predicting waves, water level and currents.

Main driving force of model is wind.
Small refined grid for Gdynia harbour

Big coarse grid for the western part of Gdansk Bay
On-line data goes into dynamic model at data center

RDCP: Currents, water level, wave, density, particle and O2 measuring system 50m outside harbour entrance
On-line data goes into dynamic model at data center

RDCP: Currents, water level, wave, density, particle and O2 measuring system
50m outside harbour entrance

SmartGuard based wind measuring system
at harbour entrance
Data used to calibrate and validate model

1 year RDCP data
- Currents (multilevel)
- Waves
- Water level
- Salinity (bottom)
- Temp (bottom)

CastAway CTD

SeaGuard profiles
Example of field campaign CTD profiles
Examples of data

3D Horizontal Speed - Column1

Horizontal currents are in general between 0-25 cm/s
Examples of data

Maximum wave height outside harbour during one year was up to 6m
Comparing model and measurements: temperature
Comparing model and measurements: surface currents
Effects of wind, currents and waves on ferry obtained through tow tank and wind tunnel tests
Weather and ship adapted information on safest harbour approach sent to ferry bridge and VTS office.

New data every 10 sec.
Ship Virtual Mask overlay plotted on existing charts.
Final product tested and ready at the end of 2013.
SAFER HARBOUR APPROACH!
Conclusions

• Ferry has been pushed onto brake water at the Gdynia harbour entrance
• For safer entry important to know and compensate for local conditions
• Model assimilate real-time data to predict waves, water level and currents
• Model was calibrated/verified with more than one year of high quality field data
• Scaled ferry specific tow tank and wind tunnel tests predicts effects on ship
• Data is transmitted every 10 sec. with recommendations on safe approach
• Model adapted for cleaning of chemical spill, if occurring
Aanderaa is the only manufacturer offering complete turn-key hyd/met systems for ports where all instruments and sensors are made in-house. This assures compatibility and reliability.
Aanderaa offers modern and efficient solutions for on-line data transfer, data storage and display. No other manufacturer offers the same flexibility and reliability.
Aanderaa deliver complete systems and is the preferred company to supply hyd/met systems for Vessel Traffic Service integrators. Our systems run all over the world.