

**OPTIMOOR is a unique, easy-to-use computer program for the analysis of vessel moorings. In use world-wide, OPTIMOOR is proven as an essential tool for vessel and port operations personnel, especially when they have to undertake assessments to meet the requirements of the Oil Companies International Marine Forum (OCIMF) and satisfy OPA-90 legislation.**

Computer simulation has in the past been the work of specialists, and was time consuming and expensive. **OPTIMOOR** is easy to use and employs the OCIMF recommended methods and formulae in a manner that can be run by any personnel to achieve results - **fast**. Licensed by Tension Technology International, the software is available in three configurations:

## OPTIMOOR STANDARD

For quayside moorings at piers, jetties and sea islands (no spread mooring, no buoys allowed in pierside, no chains in lines, no catenary effects)

## OPTIMOOR PLUS

All the configurations of OPTIMOOR standard but with added capability to include spread moorings with buoys and catenary chains (Catenary effects in chains included from both ship and anchor to buoy, catenary effects in wires included for CBM's, buoys allowed in pierside moorings.). The PLUS option also allows for batch operations which can prove very useful when considering multiple parameter combinations.

## OPTIMOOR DYNAMIC

This dynamic simulation uses vessel hydrodynamics with time varying wind and current. The user can input other time dependent forces such as wave drift. The dynamic force and response of passing ships can also be calculated.

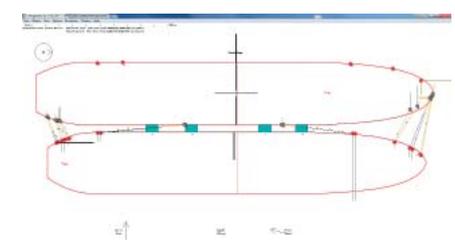
OPTIMOOR Dynamic can be run in continuous mode or in step mode to review data and vary input for example such as line failure. This program generates plots

of the time varying forces, vessel response, mooring line tensions and fender loads.

## WRM (Wave Response Module) OPTION

This enhancement is available to all versions of OPTIMOOR. It calculates the vessel response to first-order wave effects taking shallow water and solid wall effects into account. The changing line load due to vessel motion at each fairlead is calculated.

## Ship2Ship OPTION



A second ship can be added to any mooring type, pierside, turret, host at bow anchor, free drift.

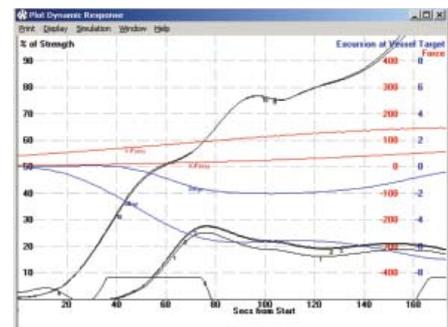
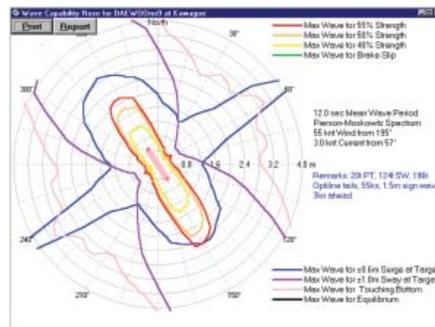
**Dynamic Mooring Response for OCIMF #4 at D. Ship 1**

Case Name: OCIMF #4 at D. Ship 1  
 Date: 16 Jul 1993  
 Current: 0.0 knot  
 51 knot Wind 90° to Ship  
 Radius of Motion: 0.00 m  
 Vessel Shifts: 0.3 in out  
 0.0° abtd  
 Draft: 6.1 m  
 (at Max Draft) Deck Level: 15.3 m above Berth  
 Clearance under Keel: 15.4 m  
 Trim: 5.0 m  
 Prof: OCIMF 1378  
 Analysis for Time: 2146  
 16 Jul 1993  
 Demo Only

Line	1	2	3	4	5	6	7	8	9	10	14	15
to Bolard/Hook	A	A	B	B	B	E	E	E	F	F	C	C
Pulkin (m)	0.01	0.01	0.03	0.27	0.02	0.06	0.29	0.05	0.24	0.05	0.04	0.04
Total Line Length	62.1	60.5	89.3	88.2	79.5	91.0	91.3	59.4	55.5	71.5	105.7	105.3
Wind Slopangle	20°	20°	23°	24°	25°	16°	16°	15°	13°	12°	14°	15°
Tension (t)	45.0	42.9	41.4	7.1	46.4	58.5	10.1	75.2	14.7	75.2	20.3	20.7
% of Strength	37%	35%	34%	5%	38%	48%	7%	62%	11%	62%	17%	17%

Fender (x=0.0)	ee	t			
Thrust (t)	toe	toe			
Bolard/Hook	A	B	C	E	F
X-Force (t)	27.8	-19.0	-29.2	29.0	-24.9
Y-Force (t)	77.8	83.5	6.5	135.4	84.4
Other X-Load					
Other Y-Load					
Total Horiz Force	82.6	85.7	29.7	138.4	88.0
Direction in Plan	20°	-13°	-81°	12°	-16°
Uplift (t)	29.7	38.0	10.2	38.5	18.5



OPTIMOOR will run on multiple Windows formats and files are prepared in a “spread-sheet” form describing the vessel mooring system and the berth mooring points. A simple case file is then created describing the mooring arrangement for the tanker at the berth. The only other inputs required are the wind and current velocities and directions. Provision is made for entering other applied forces, for example assisting tugs, passing ships, ice, and waves. Wave dynamic effects are also considered.

OPTIMOOR can calculate the non-linear RBS (strength) and load-extension characteristics for mooring lines. Data is provided for wire, aramid, HMPE, nylon double braid, nylon plaited and stranded, polyester, and polypropylene. For the synthetic ropes, both slow and dynamic response is modelled automatically.

OPTIMOOR calculates exposure areas, wind and current coefficients, and the resulting environmental forces on the vessel.

OPTIMOOR computes and displays vessel movements and mooring forces. Mooring line loads are shown in tonnes (or kips) and percent of rated breaking strength (RBS). Lines loaded to more than any specified ratio of RBS are highlighted in red. The analysis results are also reflected on the

plan graphic display and the numeric results can be printed out.

Powerful OPTIMOOR features are easy to access. One command brings a case back to its initial conditions and resets target pretensions. Another brings all lines up to the optimum tension for minimum vessel movement. The user may alter individual line tensions (in a manner analogous to tending the mooring winch) so as to bring the mooring line load distribution into better balance. A single command sweeps the wind through 360 degrees to determine the “worst-case” loading on each line, and a graphic wind or wave capability rosette can be generated.

OPTIMOOR has provision for initial and final draft and trim conditions and times. It also supports tidal variations via tide tables with automatic application of local correction factors. With these inputs, line tending requirements can be anticipated by stepping forward in time by minute or hour intervals. A single key command “fast-forwards” and displays the times at which various lines would become overloaded.

Vessel and port personnel can train on OPTIMOOR to learn good techniques for arranging and tending mooring lines. The advantages and problems of various

mooring arrangements can be explored and demonstrated. The time-forward feature with tide, draft and trim changes, will show how to anticipate line tending requirements and decide on what might be the best tending action at a particular time.

### Key Features

- All types of inshore and offshore moorings
- Shielding effect of piers
- In-built OCIMF methods and coefficients
- Easy reporting to RTF format
- Graphic plan with “drag & drop” moorings
- Toggle between Metric and USA units
- Time related analyses to account for vessel draft (loading) and tide level changes
- Single and multiple batch files
- Easy reporting to Word or Excel file.
- Auto generation of sea state limit curves, wind or wave capability rosette
- Fixed piers with catenary anchored buoys
- Option to lock vessel/berth data
- Comprehensive rope property database
- Auto or manual pre-tension to set-up mooring
- Wave Response Module [WRM] Option
- Ship2Ship option for side by side mooring

To download a full working demo version of OPTIMOOR, go to [www.tensiontech.com/programs/optimoor/optimoor\\_download.htm](http://www.tensiontech.com/programs/optimoor/optimoor_download.htm)

### For further information and a demonstration, contact:

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