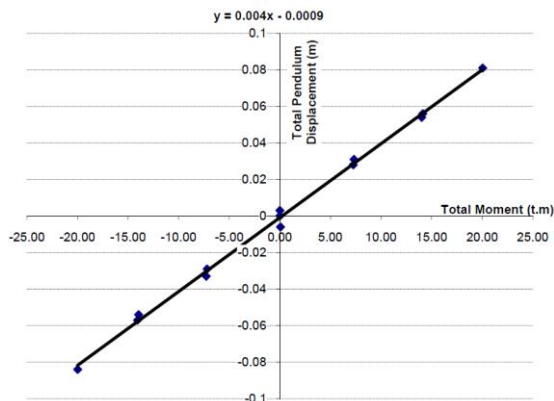


MID have proven experience in undertaking all aspects of vessel stability analysis and documentation, for a wide range of vessels which include research vessels, tugs, deep sea fishing vessels, project cargo and bunker barges, sail training ships, Ro-Ro Ferries, Naval vessels (fleet replenishment tanker, landing craft, multi-role vessel) and super-yachts. MID has worked with a wide range of flag states and class societies – MNZ, Cook Islands, Bahamas, Lloyds, DNV-GL and BV.

Lightship surveys and Inclining Experiments

MID are able to conduct and provide oversight of lightship surveys and inclining experiments as carried out according to IMO standards and requirements. MID has experience of undertaking many successful inclining experiments.

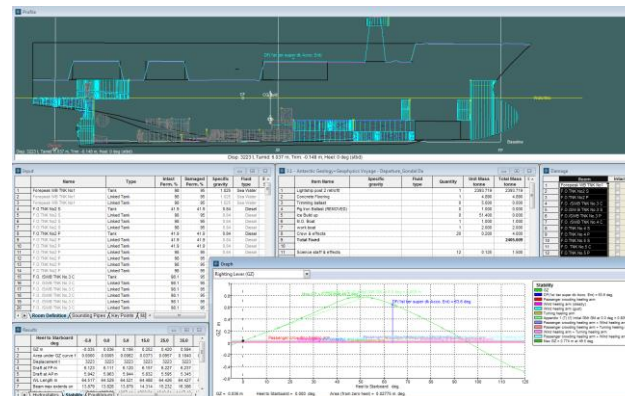


Owner's representatives receive a class compliant incline procedure document tailored to the specific vessel, giving details of the preparations required and the work process on the day.

MID maintain and supply equipment calibrated to National Standards including hydrometers, oil baths and wire pendulums with damping fins. On conclusion of the experiment the vessel will receive a detailed report of the incline with calculations suitable for submission to flag/class.

Stability Analysis

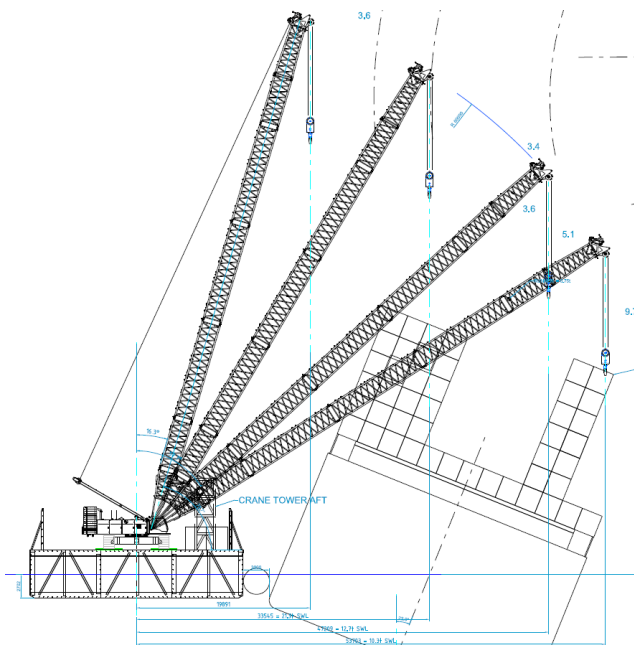
MID use the latest bespoke Naval Architectural software, principally the Maxsurf suite, which includes hydrostatic, intact and damage stability analysis and includes modules for probabilistic damage calculations. MID staff also have experience in the use of other bespoke tools such as NAPA, Autoship or GHS, should this be required.



MID are experienced in the application of criteria from many different regulation sets and in solving some of the unique stability issues that may arise. For example a tug with non-compliant IMO tow stability (for AUS NSCV operation) was able to comply with the requirements by retro-fitting pig iron ballast into its fuel tanks, all under class supervision and approval.



MID are able to respond at short notice and on unusual projects. A good example of this was MID supporting the “Rena” recovery operations with stability analysis for 280tonne crawler cranes operating from a large barge.



Stability Books

MID have standard templated stability books as setup ready to be customised for specific vessels and fully compliant with the all latest NZ, IMO and class regulations and guidelines for the compilation and production of stability books.

The books are presented in an easy to read format providing clear instructions to vessel crews and operators. Specific owner operating requirements can be included in the book [such as ice operations, helicopter operations, ballasting procedures, crane operations or towing scenarios].

Ballast loading plans

MID have calculated and prepared ballast loading information for the wheeled loading of large project modules onto transshipment barges. These ballast loading operations are time dependant and ballast pumping capacity and rates can be calculated down to the nearest minute. The barge master has a fully documented ballast plan for all stages of the loading operations, as approved by marine warranty surveyors.

Loading Sequence

Tank Location	Tank Name	Light-ship	Loading sequence (% of tank volume)				
			2.5m stage 1	2.5m stage 2	4.6m stage 1	4.6m stage 2	
Tank Fr0-4	p	P8	0%	0%	0%	0%	
Tank Fr0-4	c	C8	0%	0%	0%	0%	
Tank Fr0-4	s	S8	0%	0%	0%	0%	
Tank Fr4-10	p	P7	0%	0%	0%	50%	
Tank Fr4-10	c	C7	0%	0%	0%	50%	
Tank Fr4-10	s	S7	0%	0%	0%	50%	
Tank Fr10-16	p	P6	0%	24.00%	24%	68%	
Tank Fr10-16	c	C6	0%	24.50%	25%	68%	
Tank Fr10-16	s	S6	0%	24.00%	24%	68%	
Tank Fr16-22	p	P5	0%	30%	64%	100%	
Tank Fr16-22	c	C5	0%	30%	64%	100%	
Tank Fr16-22	s	S5	0%	30%	64%	100%	
Tank Fr22-27	p	P4	0%	30%	50%	93.5%	
Tank Fr22-27	c	C4	0%	30%	50%	70%	
Tank Fr22-27	s	S4	0%	30%	50%	70%	
Tank Fr27-32	p	P3	0%	0%	10%	60%	
Tank Fr27-32	c	C3	0%	0%	4.3%	60%	
Tank Fr27-32	s	S3	0%	0%	10%	60%	
Tank Fr32-36	p	P2	0%	0%	0%	45%	
Tank Fr32-36	c	C2	0%	0%	0%	44%	
Tank Fr32-36	s	S2	0%	0%	0%	45%	
subtotal			0.00%	14.14%	24.25%	55.00%	63.78%
Volume (m³)			0	1637	2806	6148	7150