



"The DUKC system mathematically predicts the under-keel clearance (UKC) for large ships moving in and out of ports and through shallow waterways."

Dr Terry O'Brien OAM

Founder and Executive Director
OMC International

By Nicole Gooch

A phone call from the British Phosphate Commissioners was all it took. Next thing he knew, Terry O'Brien, who'd grown up on his family farm in Victoria and gone on to become a successful young engineering scholar at Melbourne University, was flying to the isolated island of Nauru. It was 1965, at the height of the phosphate boom in Nauru and on Christmas Island, and the Commissioners needed help to design deep-sea moorings at these islands for large ships. Each mooring system comprised a number of interconnected cables, with offshore anchors located in water depths of up to 600 metres, which, at that time, were the deepest in the world.

Terry had just recently undertaken a PhD on cable structures for suspension bridges, which he completed on a Reserve Bank scholarship at Imperial College in London. He had returned to a lecturing position at Melbourne University when he received that phone call.

He went on to pursue a 22-year career at the university, winning numerous awards and scholarships along the way for his academic achievements, but his greatest achievement is the creation of software navigation technology DUKC, which stems from that initial trip to the phosphate rich islands of the Pacific.

For his experience on the rugged shores of Nauru spiked his curiosity and, back in the learned halls of the civil engineering department at Melbourne University, Terry became increasingly intrigued by waves, currents and the motions of ships. He eventually developed an innovative numerical Simulation Package for the Motion of Ships (SPMS) and, demon-

strating a rare entrepreneurial drive in the world of academia, Terry then left the university in 1987 to establish his own maritime engineering business, OMC International.

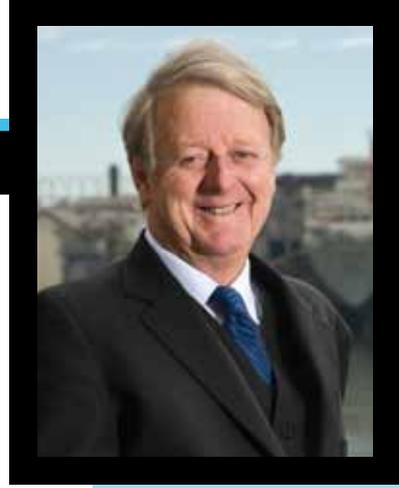
He had realised there was a niche market up for grabs, and set about developing a working system for commercial shipping based on his ship motion model. DUKC is the product of that research. Now installed in major Australian ports, in New Zealand and in Europe, the DUKC system mathematically predicts the under-keel clearance (UKC) for large ships moving in and out of ports and through shallow waterways. As such, it allows for safe passage for large vessels and, in most cases, for them to load more cargo and sail with wider tidal windows.

Terry says "developing the DUKC system and getting it into most of the largest Australian ports, and now Torres Strait and other international waters, is the highlight of my career".

But that achievement also "comes with the great satisfaction of providing work and mentorship for the young engineering graduates who work on DUKC".

It has opened up opportunities in a new area which wouldn't have been available before, and that is one of the greatest aspects of the whole expedi-

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tion for me," says Terry.

OMC International began in Terry's own family home and is still very much a family affair, with his son Peter at the helm as CEO, although it now has its headquarters in the Melbourne suburb of Abbotsford and employs more than 35 engineering graduates.

Terry doesn't have as much of a "daily hands on" approach in the business any more, but says he is excited by the next challenges in the ongoing development of the system, and loves the way "the young researchers have taken it on and developed it to where it is".

"It still has some distance to go yet in terms of its potential applications, but we hope we will achieve these over the next couple of years, and they will be the icing on the cake."

In 2010, Terry was awarded an Order of Australia Medal (OAM) for his services to the maritime transport industry. Yet Terry grew up a world away from the maritime world.

"Some of my associates over the years have had fathers who were harbourmasters or ship captains. It's been in their blood and their home environment, but that couldn't have been further from the truth in my case."

Terry says he "just enjoys the challenge of the ocean — a lot of the work that we have done hadn't been done before. The developments were

new, the opportunities that go with those developments were new, and the progress we have made, the acceptance of the work and its use — all of these contributed to my growing interest in the whole industry.”

As a young boy, Terry says he didn't even know about engineering, and it is not until he went to boarding school in Ballarat as a teenager that he became aware of that possibility, and from then on was attracted to civil engineering.

“I had no association on the farm to shipping; it is something that evolved over time, it was an evolution — opportunities open up and you go down those paths,” says Terry. “You don't really foresee where you are going to finish. If you have the basic education to understand the opportunities, then you are in a good position to be able to follow whatever comes up in life.”

On a typical balmy evening in Darwin, Terry and his wife Pauline headed to the outdoor “deckchair cinema” whilst there on a recent business trip. The film they watched was *The Boy Mir*, about a poor boy's progress towards manhood in Afghanistan.

Terry says the film suddenly “brought it all back” to him — a reminder of the importance of education to development and to providing children in poor environments or in the country with opportunities. He says growing up on the farm was a good experience, but he was lucky to be able to go to boarding school for his secondary education. “Without that education I could not have got into academia.”

It is also at Melbourne University that Terry met Pauline. Terry was a postgraduate student at the time, Pauline was studying for an Arts degree. Immediately following their marriage they left for Imperial College London on the P&O liner SS Canberra disembarking at Naples to spend two weeks in Austria, learning to ski.

Soon enough their first child was born and when the sixth arrived, Terry says, “Pauline sacrificed her PhD on Multiple Birth Children and her own

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career in Educational Psychology to provide the family nurturing role throughout the children's developmental years, and I got on with the career side of things. We pretty much worked as a team.”

Later, Pauline was also involved in setting up OMC International, putting to good use her psychology skills during negotiations and in marketing the business.

All the children have grown up to be successful in their own right. Three are physicians, one is a barrister, one an engineer and their only daughter, a neuropsychologist.

“They have all done us proud not only in their careers but in nurturing their own families,” says Terry. “It is always a great thing for parents, as they get older, to be able to see the young ones take full advantage of the opportunities offered them. It is very satisfying.”

But while they have all outshone him on the ski fields, Terry's competitive spirit has not let any of his children beat him in a golf round. And when it comes to bowling to his five sons they still cannot pick his “leggie” from his “googly”.

Asked if he has ever missed academia, Terry admits to not thinking about it much. “It was part of my earlier life, I have fond memories of it, but the challenges that have come from private enterprise have probably been much greater, and they've absorbed all my attention so I haven't looked backwards over the years.”

But now that he has a little more free time, Terry says he would like to rejuvenate those links with the university, “if anything because it creates career paths for more young engineers, which we will need”.

Terry laughs when he says the “maritime industry is certainly different to academia”. Yet he says the “people involved in it are very down to earth, practical people and they are solving everyday problems that the general public are not aware of. And it is problem solving — that is what engineering is all about.

“So I guess our training in engineering is a good fit. Although we don't spend months on board ships at sea, it is still good training to solve the practical problems associated with ports and harbours, as well as making maritime engineering more efficient and safe.”

Terry says the Order of Australia Medal was “obviously a great honour”.

“The work was satisfying in itself, without any honour, but the honour is obviously a great recognition and I am very appreciative of the support I have had from the maritime industry during the development of our technology, and I am sure that award wouldn't have been possible without that support.”

Terry now works with PIANC, the World Association for Waterborne Transport Infrastructure, and IALA, the International Association of Marine Aids to Navigation and Light-house Authorities, to help develop new industry guidelines and standards for ship navigation and channel design.

And, in 2009, completing the circle, Terry returned to Christmas Island to monitor the laying of a new single-point mooring system he designed for cruise ships such as the Pacific Sun, which used the mooring for the first time in December that same year.

As he says, he is “never short of a challenge. There is always something new.”