Marine Technology Transfer: Leveraging Challenges Into Opportunities—*Harlan Doliner*

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Whether they're gigantic, or consist of a single person hand-crafting equipment, marine technology companies face a myriad of challenges, especially in technology transfer. For the majority of American marine tech companies, including the Marine & Oceanographic Technology Network (MOTN) member companies, the challenges are magnified by the fact that the companies are very small. That means that science/engineering-centric people have to multitask the business, regulatory and legal issues involved with the imperative that a business must learn how to be global: exporting and doing business overseas to achieve market penetration, survive and prosper.

That this can be done, and done well, is demonstrated by the success and continued growth of the marine technology industry cluster in New England. The latest data, from a 2009 UMass-Dartmouth study, show New England's marine tech cluster consisted of more than 400 businesses—90 percent of which are headquartered or located exclusively in New England—more than 25,000 employees, and $3.5 billion in sales. Massachusetts alone captures 15 percent of Navy Small Business Innovation Research (SBIR) awards and converts 48 percent of its Phase I awards to Phase II. Much of the revenue to be derived from this depends on finding ways to transfer technology to purchasers, partner entities, licensees (for manufacture or otherwise), distributors, agents, as well as foreign governments and academic/research institutions.

The questions involved include: How do I find an appropriate partner business in our target market? Once a partner is found, what should the business arrangement be: a joint venture or new entity? If new, what type of entity? When we land the big contract, how do we go from R&D to production? How do I fund this: loan, partners, venture capital or sale of company stock, and what are the pluses and negatives? How do I enter into partnering arrangements, sales or service contracts, or raise capital without endangering or losing our patents and other intellectual property? What are the U.S. and target country regulatory rules and constraints, and how do I comply and keep current with them? (Think ITAR [International Trafficking in Arms Regulations] or cabotage "Jones Act" laws.) What are the tax implications of bringing the money we earn abroad back to the U.S.?

While one article can't even begin to address all these issues, let's focus on one set, as well as some newer developments that present opportunities.

Let's look at ramping up production and raising capital. Say that your company has developed and proved the new "widget" that the U.S. Navy views as indispensable, and wants 10,000 of them in short order. As you're celebrating this milestone, you look over at the corner of the room and see "Larry," who still solders each widget together, one at a time. Do you purchase/rent production equipment or license the manufacturing to someone else? Furthermore, how do you maintain "Larry" quality and comply with milspecs? What if equipment sellers or manufacturing licensees want the money up front?

Marine tech and similarly situated companies have approached these issues in a variety of ways. A traditional approach is, if obtainable, to take a loan with either existing assets of the company or accounts receivable that will be due under the contract serving as collateral.

Of course, it's prudent to scrutinize anything to be done in relation to the contract against Federal Acquisition Regulations, as performance under a Department of Defense (DOD) contract will ultimately be audited by the Administrative Contracting Officer.

Assuming the value of the company will increase because of the increased revenue (and profits) from, and the high visibility associated with, a DOD contract, that will pique interest in the widget from other purchasers and markets. Investors may then want to fund the production ramp-up by purchasing equity in the company—usually stock. Because one's actually selling an interest in the company, the company takes on certain reporting and other obligations to the investors. Major investors, venture capitalists for example, may want to exercise a degree of control that is very different from when the company's founders ran their own shop. If more than 50 percent of the stock is issued or sold to new investors, you've lost control of the company. That may be okay in some instances, particularly where some assets such as real estate or intellectual property are held by entities other than the company that's selling its stock. Some companies deal with this by raising capital in the form of private placement, in which a company's stock is sold to a group of economically qualified, industry-savvy investors in an offering structured to try to avoid undue dilution of the present owners' interests and dodging the ceding of control to investors.

Readers of *Sea Technology* know that new marine technologies and applications arise all the time. Where are we seeing them? The logarithmic explosion in robotics, autonomous vehicles and data collectors, as well as the "big data" they generate, is already resulting in an accelerated rate for technology transfers. This is compounded by new developments in ocean-based products, dredging and offshore energy technologies, the opening of the Northwest Passage and Northern sea routes, and—perhaps most immediately—by U.S. and incoming IMO regulatory requirements for ballast water management.

To expand a business globally, technologies must be navigated past the shoals of business, regulatory and legal issues. With planning and support, technology transfer opportunities that will pave the way for business growth are ripe for the taking. ■