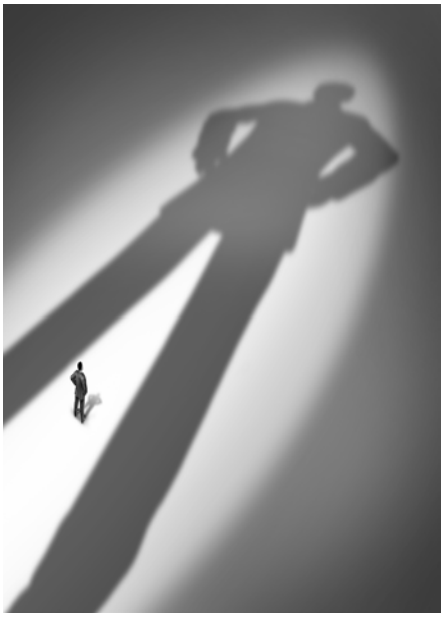
AN INVISIBLE GIANT: THE MARITIME INDUSTRY IN LOUISIANA

MARITIME WORKFORCE STUDY

Louisiana's Community & Technical Colleges
Changing Lives, Creating Futures

LABI Louisiana Association OF BUSINESS AND INDUSTRY

> *This report highlights a valuable industry-college partnership that must be improved, diversified, and scaled up to provide more maritime training options.*



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The Louisiana Association of Business and Industry (LABI) is the largest and most effective business advocacy group in the state of Louisiana representing more than 2,200 member businesses of every size, sector and region. LABI is Louisiana's chamber of commerce and the state's manufacturers association. Our mission is to foster a climate for economic growth by championing the principles of the free enterprise system and representing the general interests of the business community through active involvement in the political, legislative, judicial and regulatory processes. For more information on our work and membership, please visit www.labi.org.

The Louisiana Community and Technical College System (LCTCS) provides strategic management and support for Louisiana's 13 community and technical colleges and more than 100,000 students. Our colleges award associates degrees, technical diplomas, and industry-based certificates in programs that are aligned with business and industry and local economies, which lead students to good paying middle class jobs. One of the fastest growing two-year college systems in the nation, our colleges consistently rank nationally in the top 100 producers of two year certificates, one year certificates, and associate degrees. For more information, please visit www.lctcs.edu.

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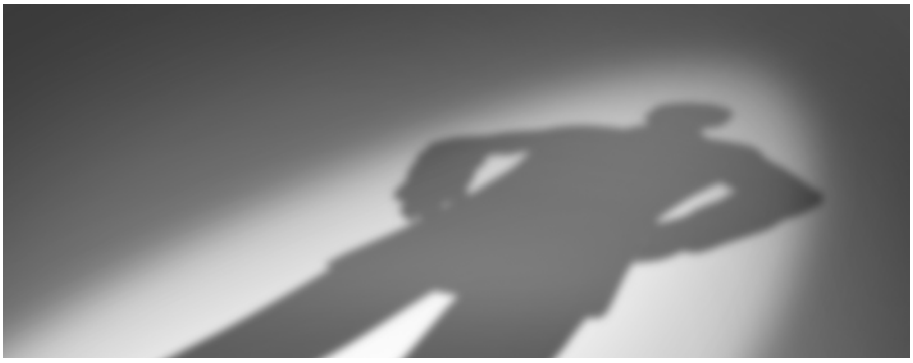
EXECUTIVE SUMMARY

AND MAJOR FINDINGS



The maritime industry is an invisible giant in Louisiana with a sizeable economic impact on the state and the nation.

An estimated one in five jobs in Louisiana is connected to the maritime industry, resulting in employment income of more than $3.5 billion every year.

In fact, the maritime industry has an $11 billion total annual economic impact in the state, and Louisiana is the only state to post more than $10 billion in total gross economic output directly related to its maritime industry.

The Louisiana Maritime Task Force estimates that “waterway dependent” jobs generate nearly $2 billion in tax revenue.

Louisiana recently ranked No. 1 in export intensity and export growth among all the 50 states, sending an estimated $59 billion in goods abroad in 2014.

The state transfers 500 million tons of cargo every year, ranking Louisiana No. 1 in waterborne commerce that accounts for 20 percent of the national total.

Louisiana leads the nation in overall numbers and concentration of maritime jobs, which frequently pay above the US average.

According to US Department of Labor statistics, Louisiana leads the nation in maritime jobs in various positions.

> *An estimated one in five jobs in Louisiana is connected to the maritime industry, resulting in employment income of more than $3.5 billion every year.*

Louisiana is the top employer of captains, mates, pilots of water vessels, sailors, marine oilers, and ship engineers.

Louisiana ranks second in the number of crane and tower operators and third in tank car, truck, and ship loaders.

Wages in Louisiana in marine positions are frequently above average. The average mean wage in Louisiana for captains, mates, and pilots is $82,610, which is higher than the national average for these positions ($75,580). Louisiana employs ship engineers at a rate 12 times higher than the rest of the country, and the annual mean wage is $84,530 – significantly higher than the national average of $75,650

Within the state, these jobs are largely concentrated in the Houma-Thibodaux area and the greater New Orleans area.

Data confirm anecdotes of workforce shortages for Louisiana maritime jobs.

Like so many other sectors of the economy in Louisiana, a shortage of qualified workers is singled out by private-sector leaders as the primary challenge to growth. An aging workforce, technological advancements, growth in offshore energy production in the Gulf of Mexico, and the expanded Panama Canal are factors that will compound the workforce shortage even further.

Furthermore, existing workforce shortages may be complicated by the historic growth in manufacturing and in the petro-chemical industry, which will frequently occur on or near the state's waterways and affect maritime workers, operations, and companies. As maritime businesses seek to expand and add jobs, projects and investments will be put at risk if a skilled workforce is not on-site to execute.

All of the maritime positions listed above have been rated as four and five-star jobs by the Louisiana Workforce Commission, indicating these are of the highest demand. Occupational projections show tremendous availability of maritime jobs in the years ahead; all but one show double-digit growth projections.

In an industry survey conducted by LABI in December 2014, half of maritime companies responded that they plan to hire between 10 and 100 employees for their Louisiana operations in the next five years. Another 20 percent will hire more than 100 maritime workers in the next five years. These figures translate to more than 3,000 jobs over the next five years from just 50 companies of more than 400 surveyed.

A quarter of companies report that they will lose 25 percent to 50 percent of Louisiana maritime workers to retirement over the next 10 years.

Educational requirements for maritime positions are minimal, and companies largely assume the responsibility for worker training on the job.

As one would expect in an "invisible" industry that is largely self-reliant, the majority of survey respondents indicate that their top recruitment strategy is online ads or websites followed closely by "word of mouth."

More than half of LABI survey respondents indicate that the minimum educational requirement for these workers is high school or no minimum requirement at all. Instead, consistent with national trends in the industry, one out of five companies simply required the basic US Coast Guard credentials or sea experience and another 18

"An aging workforce, technological advancements, growth in offshore energy production in the Gulf of Mexico, the expanded Panama Canal, and historical industrial expansion are factors that will compound the workforce shortage even further.

percent required some technical training.

The maritime industry requires basic skills training and licensing for even the most entry-level positions. American mariners are required to hold individual licenses known as the Merchant Mariner Credential (MMC), which is issued by the Coast Guard to certify mariner qualifications for a five-year period. To earn an MMC and the appropriate credentials for each level of work, mariners must complete regular training from course providers also approved by the US Coast Guard.

By a large margin, Louisiana employers are providing this training to their workers – either through in-house programs or by contracting with two-year public colleges, proprietary schools, or partner companies in the maritime industry. One interviewee noted: "In five to six years, the right worker will earn a six-figure salary – all with training funded by industry."

This mode of workforce training stands in stark contrast to other technical programs, such as nursing for example, whereby the individual seeks training then employment. The typical process for maritime jobs is in reverse, and an individual is often hired then trained.

In fact, 82 percent of companies surveyed by LABI report that on-the-job training or re-training is a standard procedure for all new recruits. The vast majority of survey respondents indicate internal training is their top strategy for this training, which includes mentoring, annual assessments, drills, internal training modules, classes, refresher courses, and other hands-on or on-site efforts.

More than a dozen companies also reported operating their own training facility in Louisiana that includes programs for maritime personnel in locations including Covington, Houma, Kenner, Mandeville, and New Orleans among others.

One-third of respondents indicate six months of training is required before the new worker's knowledge and skills are satisfactory, and another third report it takes a year. Almost one in five companies describe this training period as one to three years.

The State of Louisiana provides maritime training largely through two-year schools, which is almost always conducted on a contract basis with private companies.

Two-year colleges with maritime programs report they rely on companies to fund an estimated 90 percent of all training courses. As a result, the training courses are designed to meet the needs of industry by necessity.

The vast majority of state maritime training takes place in three institutions within LCTCS: Delgado Community College in New Orleans; Fletcher Technical Community College in Houma; and South Central Louisiana Technical College in Morgan City. In 2014, Delgado reports 5,416 participants completed courses at the Maritime, Fire, Radar, and Industrial Training Facility. Similarly, South Central reports 2,864 courses completed and Fletcher reports 846.

These programs are training workers in basic marine safety and survival required by federal regulations and company standards, as

well as more specific maritime courses such as Bridge Resource Management, Celestial Navigation, Radar Observers, Tankerman, and more. Nearly all of these courses are taken individually and tailored for licensing and credentialing requirements and do not necessarily represent a progressive path toward a degree. Very little college credit is issued by Louisiana technical schools for performance of maritime coursework – an indication of just how few students are seeking out training on their own to enter the industry.

Only 10 companies that completed the LABI survey reported contracting with Louisiana community and technical colleges for customized maritime training. These respondents estimated a per-student annual investment for training at technical and community colleges in a broad range from $1,000 to

$10,000. Although the sample size is small, respondents were generally satisfied with the quality of the training at two-year schools; only one was dissatisfied.

Of note, a sizeable majority of survey respondents reported no existing relationships with public or private high schools nor with four-year universities for maritime training or recruitment. Roughly half reported working with private companies or contractors for training in Louisiana.

A whopping 91 percent of companies surveyed by LABI believe the State of Louisiana should do more to provide industry with qualified maritime workers. Interestingly, many of the recommendations involved engagement with K12 schools and better connections to careers.

The report highlights a valuable industry-college partnership that must be improved, diversified, and scaled up to provide more maritime training options.

The current approach – customized training to employers – is critically important for industry, and the colleges are generally meeting that need for certain employers. The strong relationships with industry and the history of partnership and responsiveness, particularly at Delgado and South Central, cannot be over-emphasized.

However, there is no overarching effort tying the schools together. There is no standard curriculum or requirements for course completion. There is no statewide credential or metric for success.

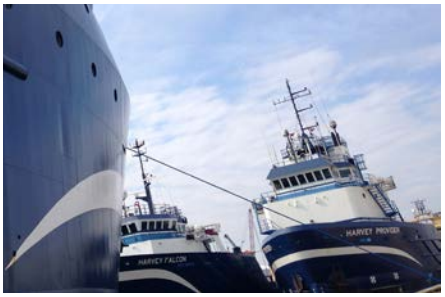
Furthermore, a substantial number of companies appear unaware of the training or do not choose to utilize it. There is little market reach outside the state for Louisiana's maritime training either, despite available jobs.

Finally, there has been little concerted effort to provide entry points for non-traditional students that may desire a maritime career who are not yet employed, for veterans exiting the military and seeking a new career, and for K12 students or those who want to begin maritime careers at a two-year or four-year college.

To maximize economic opportunities for the state, the report's recommendations chart a path to continue and expand industry-based training while also attracting new workers into maritime careers.

LCTCS should convene maritime stakeholders including employers, two-year colleges, trade associations, ports, and K12 schools among others in a task force format to further identify the types of training in demand and design a plan to systematically meet those needs. **Much like the Craft Trade Task Force, a detailed analysis of needs, a mapping of programs, and targeted training expansions must occur in the maritime sector to fill job openings with skilled workers** in the years ahead.

In drafting a business plan, **the stated goal of LCTCS should be to create a nationally recognized maritime training institute** that begins as an LCTCS Center of Excellence. Ultimately, the concept of a Louisiana Maritime and Petroleum Workforce Training Academy may require a new physical space in a centralized location convenient to jobs and industry. However, the initial work to move toward a statewide maritime academy should begin immediately such as cross-institutional



> *The strong relationships with industry and the history of partnership and responsiveness, particularly at Delgado and South Central, cannot be over-emphasized.*

collaboration; the development of clear, seamless career tracks for students; an industry-driven, standardized curriculum that meets needs for employers in blue water, green water, and brown water; and standard fees and tuition for aligned coursework. In addition to aligning the three institutions with established maritime programs, industry should be consulted on the demand for particular forms of training at new sites such as on the Northshore where there is a high concentration of maritime companies but no technical training available today.

In the immediate-term, **the maritime training programs should better market their products and be aggressive and entrepreneurial** in reaching out to more maritime companies. Of the 50+ maritime survey respondents, less than 20 percent were able to provide feedback on the training at technical colleges, illustrating a sizeable sample size that may not have had experience with the schools but likely have training needs. In addition to adding value to the maritime industry, these training programs are revenue-positive for the colleges and generate substantial funds that can further assist with the overall budget deficit in higher education.

To grow the workforce and fulfill the demand, **state training programs will need to adapt to be an attractive, informed option for students** and others not as familiar with maritime careers. LCTCS should work across colleges to ensure that courses build upon each other seamlessly, allowing students and workers to add skills, certificates, licenses, and degrees throughout their career. The colleges should deliberately design career pathways, explain the jobs available at each level, and share that information with the public. Outreach should extend to K12 schools on a district basis or through regional JumpStart partnerships.

Non-credit courses serve an immediate need, are flexible, and can be paid for individually, often by industry, but they are not eligible for TOPS or TOPS Tech. If the expanding workforce needs are to be met, more students must seek to enter this career and move up the career ladder by earning college credit and portable credentials. **The colleges should set a goal to expand for-credit maritime training;** there should be a credit, non-credit hybrid that benefits both industry and students.

Finally, the state should **explore the use of federal workforce funds to promote maritime training**, replicating models from other states. In Texas, the state workforce agency oversees a Skills Development Fund grant, and local workforce investment boards provide scholarships to support training in high-skill, high-growth occupations including the maritime sector along the Gulf Coast.

“Louisiana has over 2,800 miles of navigable waterways — second only to Alaska.

CHAPTER 1: OVERVIEW

MARITIME WORKFORCE STUDY

Louisiana has over 2,800 miles of navigable waterways – second only to Alaska.[1] At the mouth of the Mississippi River, the state's unique geography provides the backbone of the nation's largest concentration of maritime workers and activity. As global commerce grows increasingly important, so does the maritime industry. Louisiana recently ranked No. 1 in export intensity and export growth among all the 50 states,[2] sending an estimated $59 billion in goods abroad in 2014.[3] The US Custom District based in New Orleans ranked first in the nation for waterborne export trade and has held the top spot for at least 10 years.[4]

> *Those searching for signs of hope in the U.S. economy need look no further than an industry too often taken for granted – the American maritime industry.*
>
> *— US Congressmen Duncan Hunter (R-CA) and Steve Scalise (R-LA), The Washington Times, March 25, 2014*

Even as Louisiana holds a preeminent position in an industry critical to 21st century economic growth, the maritime economy is frequently overlooked in discussions of Louisiana's major industries. If the state is to continue to take advantage of global trade and remain competitive in the decades ahead, a better understanding of the needs and interests of the maritime industry is imperative.

First and foremost among those needs is a skilled workforce. Like so many other sectors of the economy in Louisiana, a shortage of qualified workers is singled out by private-sector leaders as the primary challenge to growth. This has been true for some time in the maritime industry and will soon be complicated by the historic growth in manufacturing and in the petrochemical industry, which will frequently occur on or near the state's waterways and affect maritime workers, operations, and companies. As maritime businesses seek to expand and add jobs, projects and investments will be put at risk if a skilled workforce is not on-site to execute.

The maritime industry requires basic skills training and licensing for even the most entry-level positions, which are largely defined and licensed by the federal government through the US Coast Guard. American mariners are required to hold individual licenses known as the Merchant Mariner Credential (MMC), which is issued by the Coast Guard to certify mariner qualifications for a five-year period. To earn an MMC and the appropriate credentials for each level of work, mariners must complete regular training from course providers also approved by the US Coast Guard. This is required of mariners ranging from able seamen and mates to captains and engineers.

This highly regulated workforce poses a unique set of challenges to training. By a large margin, Louisiana employers are providing this training to their workers – either through in-house programs or by contracting with two-year public colleges, proprietary schools, or partner companies in the maritime industry. This mode of workforce training stands in stark contrast to other technical programs, such as nursing for example, whereby the individual seeks training then employment. The typical process is in reverse, and an individual is often hired then trained.

As a result, the training courses are designed to meet the needs of industry by necessity. Furthermore, course offerings are generally approved by the US Coast Guard and are therefore standardized with regard to content and minimum requirements regardless of the provider. Despite the various types of providers in Louisiana and the array of efforts underway by the maritime industry to ensure appropriate training, there remains a shortage of training opportunities and a shortage of workers.

In recognition of this challenge, the Louisiana Community and Technical College System (LCTCS) has partnered with the Louisiana Association of Business and Industry (LABI) to better understand the specific training needs, the perspective of maritime employers on the offerings and of training at LCTCS sites today, and gaps that must be filled in order to expand maritime training programs. It is our vision of LCTCS and LABI that the State of Louisiana and industry can work together to create a more expansive, well-coordinated, industry-driven curriculum and certification program to fill high-priority maritime positions with qualified workers.

AN INVISIBLE GIANT: THE MARITIME INDUSTRY IN LOUISIANA

1 IN 5 JOBS

An estimated one in five jobs in Louisiana is connected to the maritime industry, resulting in employment income of more than $3.5 billion every year.[5]

$11 BILLION ANNUAL ECONOMIC IMPACT

In fact, the maritime industry has an $11 billion total annual economic impact in the state, and Louisiana is the only state to post more than $10 billion in total gross economic output directly related to its maritime industry.[6]

$2 BILLION IN TAX REVENUE

According to the Louisiana Maritime Task Force estimates that "waterway dependent" jobs generate nearly $2 billion in tax revenue.[7]

> *"In today's global economy, hundreds of millions of people all over the world rely on ships to transport the great multitude of commodities, fuel, foodstuffs, good and products on which we all depend. Yet, for most of them, shipping, not to mention the huge range of related maritime activities…do not register a particularly strong echo on their personal radar.*
> *— International Maritime Organization's Year of the Seafarer, 2010*

The state transfers 500 million tons of cargo every year, ranking Louisiana No. 1 in **waterborne commerce** that accounts for 20 percent of the national total.[8] Much of this activity takes place at more than 28 ports along the coast and inland waterways, including four ports that rank in the top in the United States in total tonnage:[9]

NO. 1

South Louisiana
No. 1 for the past 10 years
252 million tons

NO. 4

New Orleans
79 million tons

NO. 9

Baton Rouge
60 million tons

NO. 10

Port of Plaquemines
58 million tons

Louisiana also ranks second in the nation for private-sector employment in the **shipbuilding** and repairing industry, encompassing just over 12 percent of the national total.[10] Much of this work takes place in shipyards and includes construction, repair, alteration, conversion, and specialized services. In some cases, manufacturing takes place outside the shipyard as well.

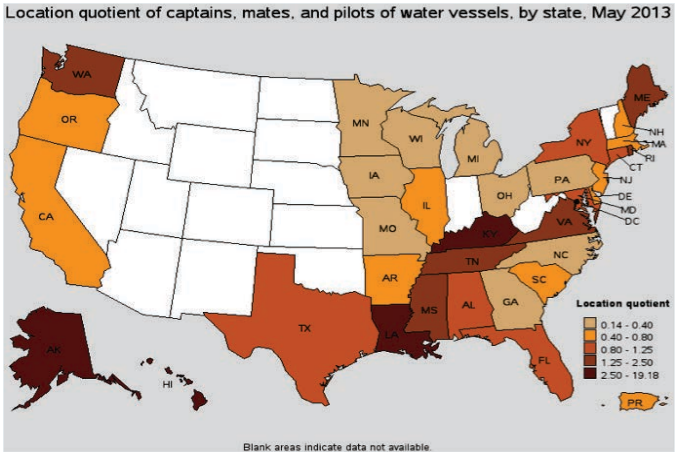
The maritime industry is often neglected in discussions of Louisiana's economy in part because their work is closely linked with the **oil and gas industry**. With more than one-quarter of America's domestic energy produced offshore, the oil and gas and maritime industry are inter-dependent.[11] One industry leader notes: "The oil and gas industry depends on the more than 2,000 specialized vessels in the US fleet to carry out seismic research, drill test wells, lay pipe, transport and install production facilities, and continually supply them with personnel, commodities, fuel, and equipment."[12] Maritime employment includes vessel operators, marine terminals shipyards, ports, and the inter-modal logistics of moving goods through the state and around the world.

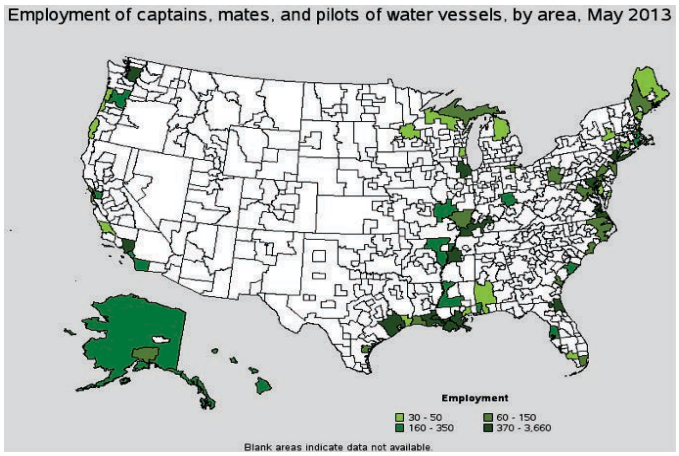
LOUISIANA LEADS THE NATION IN MARITIME JOBS

The US Bureau of Labor Statistics (BLS) estimates the median pay of America's 81,600 water transportation workers as $48,980 per year or $23.55 per hour.[13] Jobs across the country in this sector are predicted to grow at a rate of 13 percent by 2022 with an additional 10,900 maritime jobs.[14]

The agency notes that education and training requirements vary by the type of job. Officers and engineers typically require a bachelor's degree while sailors and marine oilers do not. A Transportation Worker Identification Credential (TWIC) from the US Department of Homeland Security is required for all mariners working on ships with US flags, which states the person is a US citizen or permanent resident and has passed a security screening. Merchant Marine Credentials from the US Coast Guard are also usually required, which typically involve a physical, hearing, and vision test as well as a drug screening and a basic class on ship safety. Pilots are also licensed by the state they work in.[15]

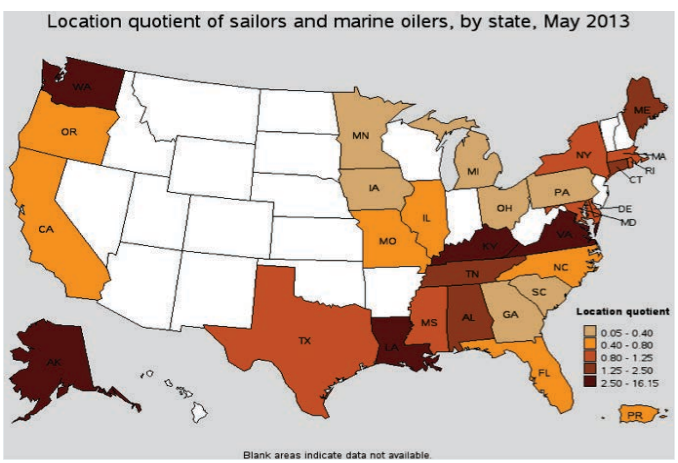
According to US Department of Labor statistics, Louisiana leads the nation in maritime jobs in various positions. Louisiana is the top employer of captains, mates, pilots of water vessels, sailors, marine oilers, and ship engineers.[16] Louisiana ranks second in the number of crane and tower operators[17] and third in tank car, truck, and ship loaders.[18] Within the state, these jobs are largely concentrated in the Houma-Thibodaux area and the greater New Orleans area.

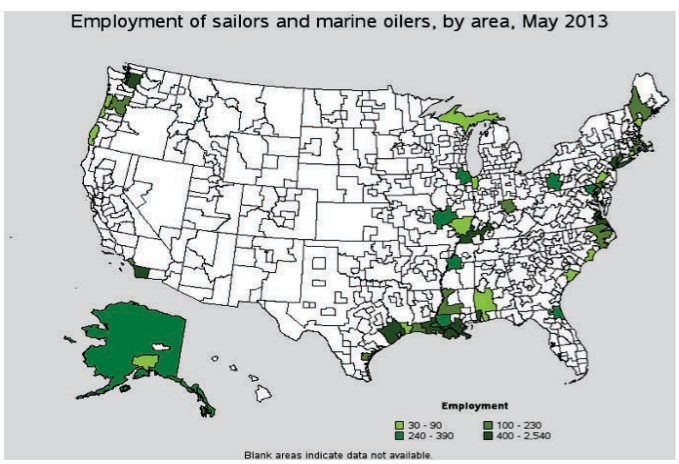




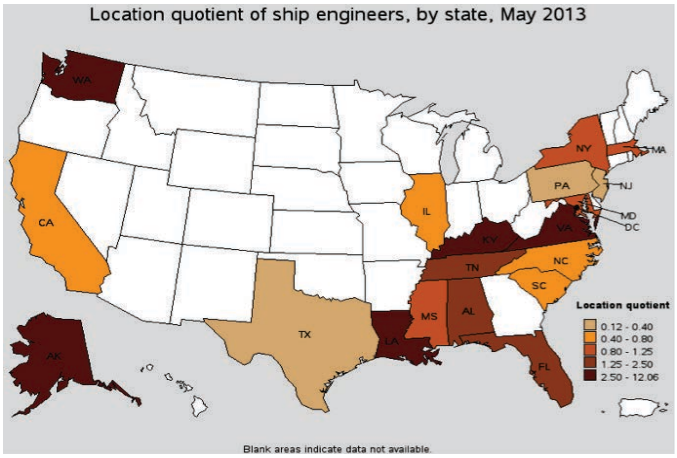
Note: A "location quotient" indicates the ratio of the area concentration of occupational employment to the national average concentration. In the case of captains, mates, and pilots of water vessels, Louisiana's location quotient is more than 19 times the national average.

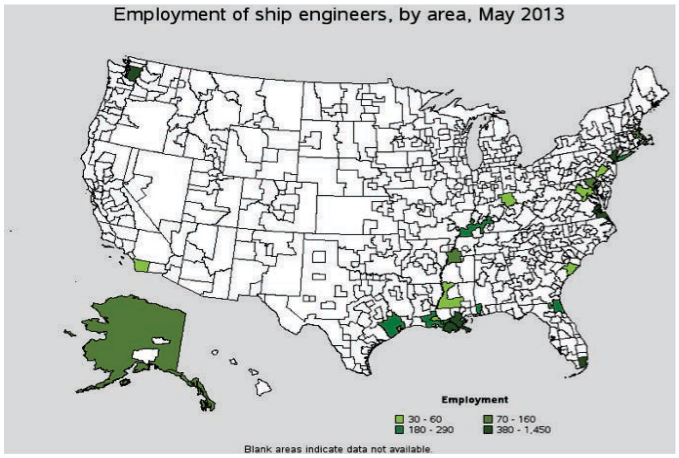
For every 1,000 jobs in Louisiana, 4.38 are **captains, mates, and pilots of water vessels**. Louisiana employs more than 19 times the national rate in these positions. Louisiana is not only the state with the highest concentration of jobs for captains, but the state outright employs more captains than any other state with an estimated 8,260 – making up more than a quarter of all captains in the country. California is second with just 2,280. The average mean wage in Louisiana for captains, mates, and pilots is $82,610, which is higher than the national average for these positions ($75,580).[19] Four metropolitan areas in Louisiana rank in the Top 10 nationally for the concentration of captain, mates, and pilot jobs: Houma (No. 1), New Orleans (No. 2), Lafayette (No. 3), and Lake Charles (No. 7). Houma takes the top spot by a landslide with a location quotient 165 times the national average. The annual mean wage range within the state from a low of $70,220 in Lake Charles to a high of $89,090 in the New Orleans area.[20]



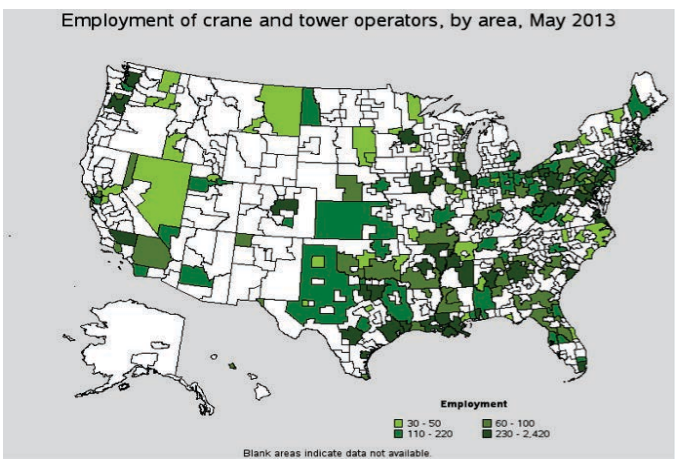


In the category of **sailors and marine oilers**, Louisiana again takes the No. 1 spot with 6,620 workers, which means more than one in five American sailors and marine oilers are based in Louisiana. Texas ranks second with just 2,340 sailors. Louisiana's average mean wage is slightly higher than the national average at $41,710, but lower than a number of other states. Five metropolitan areas in Louisiana are among the Top 10 most concentrated cities in the country for sailors and marine oilers: Houma (No. 1), New Orleans (No. 2), Lafayette (No. 3), Lake Charles (No. 4), and Baton Rouge (No. 10). Mean annual wages again range widely in-state with $27,380 in Lake Charles to $43,130 in New Orleans.[21]

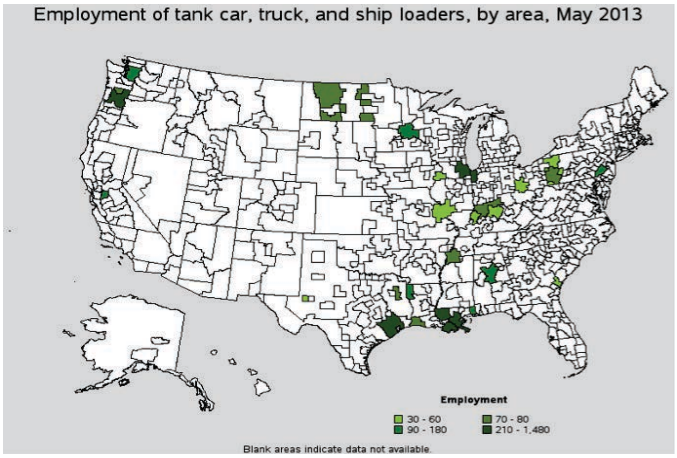




Ship engineers is the third category of maritime workers where Louisiana ranks No. 1 in the nation. The state narrowly edges out Virginia for the top spot in overall employment of ship engineers with 1,700 out of an estimated 9,930 in the United States. Louisiana employs ship engineers at a rate 12 times higher than the rest of the country, and the annual mean wage is $84,530 – significantly higher than the national average of $75,650 and fourth highest of any state. Houma-Thibodaux has the highest concentration of ship engineers in America where the position represents 8.49 of every 1,000 jobs and the annual wage of $93,840 is higher than the state average for ship engineers. New Orleans (No. 4) and Lafayette (No. 9) are also among the Top 10 metro areas with high concentrations of ship engineers.[22]



Louisiana ranks No. 2 in the nation behind Texas for the employment of **crane and tower operators** with an estimated 3,980 – a figures that again takes the top ranking nationally for concentration of these positions (nearly seven times higher than the rest of the nation). Of note, the annual mean wage is $50,270, which is slightly higher than Texas. Within Louisiana three metro areas are ranked in the Top 10 for cities that employ crane and tower operators: New Orleans (No. 4), Baton Rouge (No. 6), and Houma-Thibodaux (No. 10). With regard to concentration of these positions, Houma again takes No. 1 in the nation at 17 times higher than the national rate.[23]



Louisiana comes in at No. 3 for the employment of **tank car, truck, and ship loaders** when compared to other states, with Texas and New Jersey taking the top two spots. However, when adjusted for population, Louisiana moves up to No. 1 for the concentration of tank car, truck and ship loaders, which is seven times the national rate. The annual mean wage is $42,770 – again slightly higher than Texas. Four Louisiana cities are among the Top 10 for the highest concentration of tank car, truck, and ship loaders: Houma-Thibodaux (No. 1), New Orleans (No. 4), Lake Charles (No. 6), and Baton Rouge (No. 9). Lake Charles represents the high end of wages for these positions within Louisiana at $47,700 with Houma-Thibodaux taking the bottom spot at $42,120.[24]

"Louisiana outright employs more captains than any other state with an estimated 8,260 – making up more than a quarter of all captains in the country.

The table below illustrates the numbers of employed workers in each position in Louisiana, the anticipated growth for each position over ten years, annual wages, and requirements for education, training, and certification.[25] Of particular note, all of these positions have been rated as four and five-star jobs by the Louisiana Workforce Commission, indicating these are of the highest demand. Occupational projections show tremendous availability of maritime jobs in the years ahead. All but one show double-digit growth projections. The exceptional growth anticipated in each occupation illustrates the need and rationale for additional high-quality training outlets.

LOUISIANA DATA

Job Title and Star Rating	2012 Estimate	2022 Projected	10-Year % Change	2013 Annual Wage	Most Significant Source of Education/ Trainning	Job Training	Occupational License Required
Sailors, Marine Oilers	6,010	7,190	20%	$41,170	Post-sec. non-degree award	Moderate OTJ training	✔
Captains, Mates, Pilots of Water Vessel	9,270	7,190	20%	$82,610	Bachelor's degree	None	✔
Crane, Tower Operators	4,640	5,480	18%	$50,270	Post-sec. non degree award	Moderate OTJ training	Certificate available
Tank Car, Truck, Ship Loaders	1,000	1,140	14%	$42,770	Less than high school	Short-term OTJ training	N/A
Ship Engineers	1,530	1,670	9%	$84,530	Bachelor's degree	None	N/A

Anecdotally, reports from companies abound with regard to the shortage of skilled maritime workers today. The next section outlines the results of an industry survey confirming this assertion.

FACTORS THAT WILL COMPOUND THE WORKFORCE CHALLENGE

Maritime companies and workers self-define their activities in three ways, each with unique characteristics and training in some instances:

"Blue water" is defined as the open ocean (i.e. ships and tugs).

"Green water" refers to the region between the blue water and the brown water from the coastal zone past the continental shelf (i.e. oil field support, crew and supply boats).

"Brown water" indicates the coastal area, often encompassing harbors and rivers (i.e. tug and barge).

An Aging Workforce

The State of Louisiana has recognized that maritime positions will be in high demand in the next five years. There are several issues at play that could compound the workforce shortage even further. Globally, much like other industries, the maritime sector is preparing to face the challenges of an aging workforce that is not being replaced by qualified new employees. The International Maritime Organization notes: "It has been widely predicted that, unless something is done rapidly, shipping will soon face a manpower crisis; there simply will not be enough properly qualified officers to run a world fleet that continues to increase in size."[26] Studies note that a life at sea is not seen as "an attractive and appealing career," even as the quality of life on board has changed dramatically.[27] High-tech systems are utilized to guide vessels, for example, even as email is available on-board to allow workers to stay in touch with families.

Technological Advancements

Technological advancements span the maritime industry from ship building to vessel guidance and beyond. This field is known as "Blue Tech" and is growing rapidly in the US and overseas. Maritime robotics, advanced data collection, vessel guidance systems, floating infrastructure, and new techniques in shipbuilding are just a few of the areas that maritime has gone high-tech. In fact, the field is growing so fast that workforce statistics from the US Department of Labor do not yet recognize how many jobs exist in these new sectors of the maritime industry.[28] Suffice it to say that industry estimates indicate a sizeable portion of maritime jobs are now tech-related. One report notes: "A modern ship is more likely to be controlled by a single joystick and a mouse-ball in the arm of the helmsman's seat; the chief engineer will probably have clean hands and the calluses on his or her fingers will be from tapping a keyboard rather than wielding a spanner."[29] Technology is changing the industry and the skills required to work in the industry.

Energy Production

Along the Gulf Coast, there are other factors that are compounding the workforce shortage in the maritime industry. The "fastest growing offshore market in the world" for energy production is the Gulf of Mexico largely as a result of deepwater expansions.[30] The oil and gas industry is grappling with its own workforce challenges as well – many that overlap with the maritime sector. Some estimates for the number of oil and gas skilled professionals who will reach retirement age this decade are as high as 40 percent, and companies are struggling to address "the Big Crew Change" using 20th century strategies for recruitment and training.[31] In a 2012 global survey of oil and gas companies, nearly three out of four reported that staffing difficulties actually led to delayed projects.[32]

Expanded Panama Canal

Projections by the Louisiana Maritime Advisory Task Force indicate that waterborne cargo in Louisiana is expected to grow 40 percent between 2005 and 2030 with most of that growth occurring in foreign cargo in part because of the expanded Panama Canal.[33] Ports along the Gulf Coast are expected to benefit when the expansions open in 2016 when ships twice the size of those transiting today will be able to access the US East and Gulf Coast ports from Asia. One article notes the potential growth for break-bulk shippers, in particular, that may choose to export from the Gulf Coast.[34] The Port of New Orleans projects that volume at Gulf Coast ports will grow from 1.5 million TEUs to 3 million TEUs by 2028.[35]

Historic Industrial Expansion

Finally, the historic industrial expansion underway in south Louisiana is certain to compound workforce shortages in the maritime industry. More than $100 billion in industrial projects are either under construction or at the front-end engineering and design phase.[36] Louisiana will have more than 2 million non-farm workers for the first time in its history.[37] The State is grappling to meet the training needs of more than 80,000 craft workers – some of the same potential employees sought by the maritime industry no doubt.

CHAPTER 2: SURVEY OF INDUSTRY NEEDS

AND PERCEPTIONS OF TRAINING

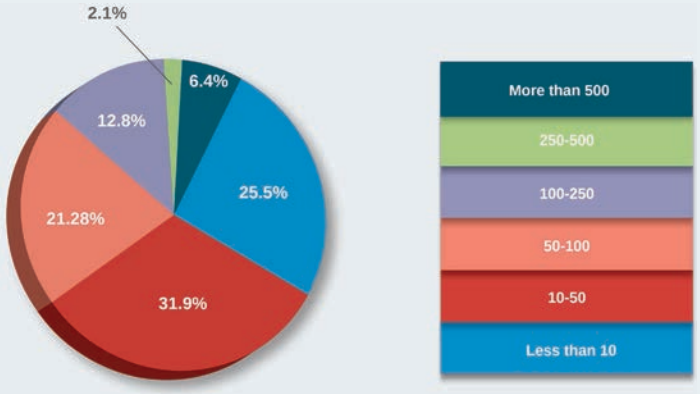
The Louisiana Association of Business and Industry (LABI) developed an online survey on the maritime industry's workforce needs and perceptions of training. It was sent to LABI members and non-members totaling more than 400 companies with Louisiana maritime operations and interests. The vast majority maintain a physical address in Louisiana.

The survey was sent directly to contacts at maritime companies via email in December 2014 and was circulated by various trade associations as well. More than 50 responses were submitted anonymously over a three-week period. The information provides a useful generalization of the workforce needs and training by Louisiana maritime industry.

Industry Workforce Needs

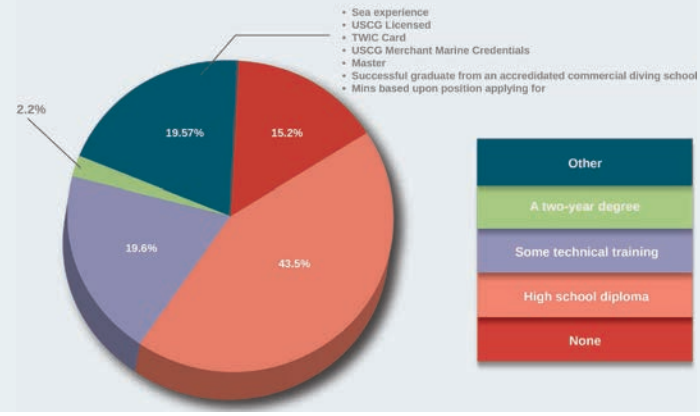
Survey respondents indicate they will need as many as **3,000 additional employees** for maritime operations in Louisiana the next five years. This is a particularly staggering figure given that this survey represents the responses of only 50 companies out of hundreds. Roughly half of respondents indicated that the average years of experience of their personnel in Louisiana maritime operations today is 10-20 years. A quarter of companies report that they will lose 25 percent to 50 percent of their Louisiana maritime workforce to retirement between now and 2025, while another five companies report they will lose more than half of their workers to retirement in that same period.

How many additional maritime workers do you project you will need for your Louisiana operations in the next five years?



When asked about the top position companies are currently recruiting for Louisiana maritime operations, respondents most often selected captains followed by deckhands and wheelmen as well as welders/pipefitters/machinists, ROV technicians, surveying, and freight forwarding. The second-highest position companies are reportedly recruiting is tankerman followed closely again by captains as well as chief engineers, managers/supervisors, mates, deckhands, and pipefitters.

What is the minimum education requirement for the majority of your maritime personnel?



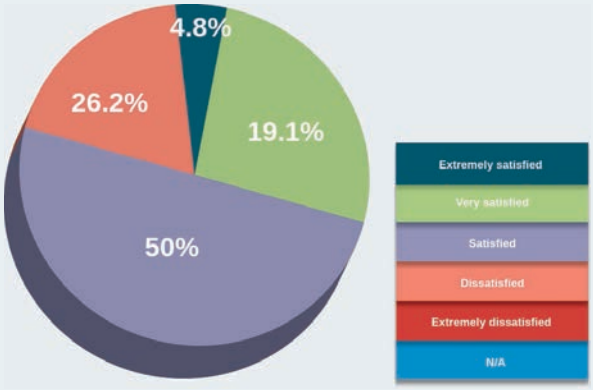
What is perhaps most interesting is that more than **half of respondents indicate that the minimum educational requirement for these workers is high school or no minimum requirement at all.** Instead, consistent with national trends in the industry, one out of five companies simply required the basic US Coast Guard credentials or sea experience and another 18 percent required some technical training. Only 2 percent of respondents required a two-year degree for the majority of their maritime personnel in Louisiana.

> *"More than half of respondents indicate that the minimum requirement for these workers is high school or no minimum requirement at all.*

Recruitment and Skills

As one would expect in an "invisible" industry that is largely self-reliant, the majority of survey respondents indicate that their **top recruitment strategy is online ads or websites followed closely by "word of mouth."** Newspaper ads, job fairs, and partnerships with technical schools were also reported. Several companies noted their efforts to train and promote from within the organization, and a few admitted to intentionally luring experienced employees away from other companies.

How satisfied are you with the knowledge and skills of your new recruits?



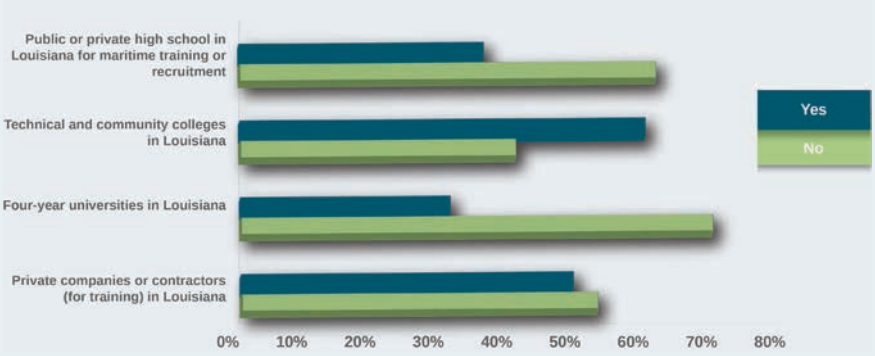
Half of companies report they are satisfied with the knowledge and skills of new recruits and another 25 percent are very or extremely satisfied. Only one in four companies are dissatisfied with the knowledge and skills of new recruits. Despite this figure, **82 percent of companies reported that on-the-job training or re-training is a standard procedure for all new recruits.** One-third of respondents indicate six months of training is required before the new worker's knowledge and skills are satisfactory, and another third report it takes a year. Almost one in five companies describe this training period as one to three years.

Current Effort and Programs

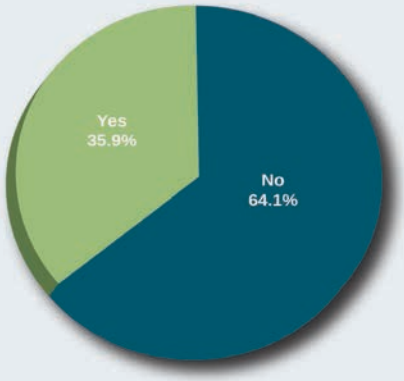
The vast majority of survey respondents indicate **internal training as their top strategy for training or retraining maritime personnel for technical positions.** Components of this training include mentoring, annual assessments, drills, internal training modules, classes, refresher courses, and other hands-on or on-site efforts. More than a dozen companies report utilizing formal apprenticeships as a component of the hiring and training process for maritime personnel. More than a dozen companies also reported operating their own training facility in Louisiana that includes programs for maritime personnel in locations including Covington, Houma, Kenner, Mandeville, and New Orleans among others. The numbers served annually at these in-house training facilities totaled 2,500 to 3,000 people. Other strategies listed to train or re-train personnel for maritime operations in technical capacities include Incumbent Worker Training grants, trade conferences, subject-matter experts, and technical schools.

More than 70 percent of survey respondents reported NO existing relationships with four-year universities and more than 60 percent said the same about public or private high schools for training or recruitment. On the flip side, **more than 60 percent do report partnerships with technical and community colleges in Louisiana.** More than half of the companies also report relationships with private companies or contractors for training.

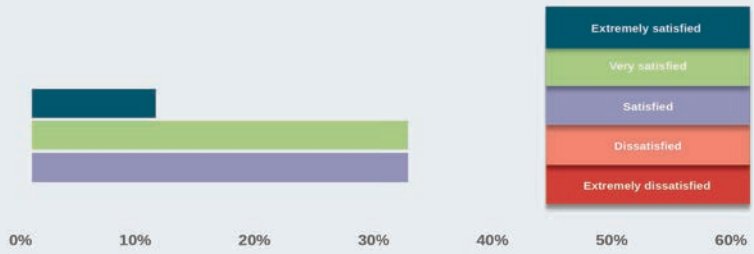
Do you have existing relationships with....



Do you actively seek to recruit and hire graduates from maritime training programs at Louisiana community and technical colleges?

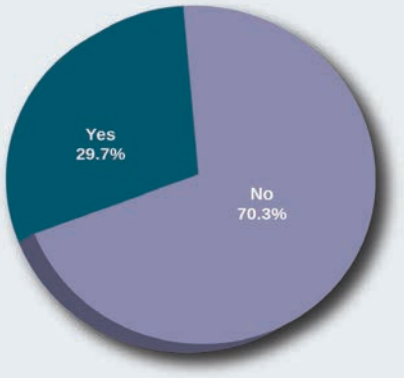


Please specify the level of satisfaction with the quality of training.

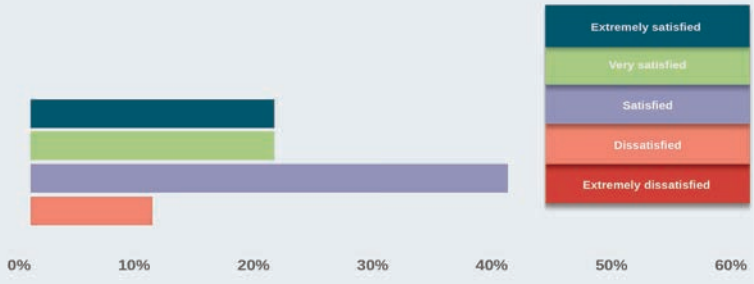


When asked specifically if the company actively seeks to recruit and hire graduates from maritime training programs at Louisiana community and technical colleges, the majority said they do not (64 percent). Eight companies noted their active recruitment efforts were targeted at Delgado and Young Memorial (South Central) as well as Fletcher, Nunez, Baton Rouge Community College, and Northshore Technical Community College. When asked to rate their satisfaction with the quality of training, zero companies were dissatisfied.

Do you contract with Louisiana community and technical colleges for customized maritime training?



Please specify the level of satisfaction with the quality of training.



Only 10 companies that completed the survey reported contracting with Louisiana community and technical colleges for customized maritime training. This is an interesting fact, given that colleges rely on companies to fund an estimated 90 percent of all training courses they currently provide. The respondents estimated **a per-student annual investment for training at technical and community colleges in a broad range from $1,000 to $10,000.** The total costs for each company were sizeable. However, again, although the sample size is small, respondents were generally satisfied with the quality of the training; only one was dissatisfied.

Interest and Demand

When asked **if the State of Louisiana should do more to provide industry with qualified maritime workers, a whopping 91 percent responded positively.** Samples from the open comments section of the LABI online survey are outlined below. Interestingly, many of the recommendations involve engagement with K12 schools and better awareness of maritime careers and salaries.

The State of Louisiana should provide means to encourage high school and collegiate students to enter the maritime industry through earning their USCG credentials as well as training associated with obtaining those credentials…

[The state needs to] educate young people not interested in the university that there is a viable alternative in the maritime industry to earn a good living and provide for your family.

The need for skilled workers in the logistics field is high. Having workers come in with a base knowledge of logistics would greatly help our workforce.

The shortage of skilled workers makes it necessary for the State and others to provide skills training for Louisiana workers.

Work boat captains should get the equal of a Merchant Marine Academy training in Louisiana. Most go out of state.

Mariners can make a great living with excellent benefits. High-school age students not pursuing college need to be aware of the possibilities.

With a state that thrives on the maritime industry, it seems like they should do their part to train people for this industry.

The training offered in technical schools should be industry driven and presently I feel that is not the case. Honest and open dialogue between the education side and the business side should happen prior to implementing or modifying training within the schools.

More experienced maritime workers keep Louisiana competitive.

Of note, very few respondents report having operations in another state where they do have strong partnerships or models to produce trained workers. The workforce challenge, skills gap, and availability of training is clearly not unique to Louisiana.

When asked about specific actions the State could take to assist companies with workforce needs in maritime fields or other industry sectors, companies suggested the following:

- Awareness raising, outreach, and training in junior high, high school, and college
- Better connections for veterans
- Tax incentives or subsidies for workforce training including apprenticeships
- Grants or scholarships for workforce training in high-demand fields such as the maritime industry
- A maritime academy
- Improved dialogue with industry in general and with regard to training providers and their programs

> *In five to six years, with the right worker, he will earn a six-figure salary — all with training funded by industry.*

> *We use the local college when we can, but they are often booked.*

> *We need more basic safety and STCW training due to heightened standards.*

> *We need a greater focus on "brown water" curriculum.*

> *We need more dynamic positioning training.*

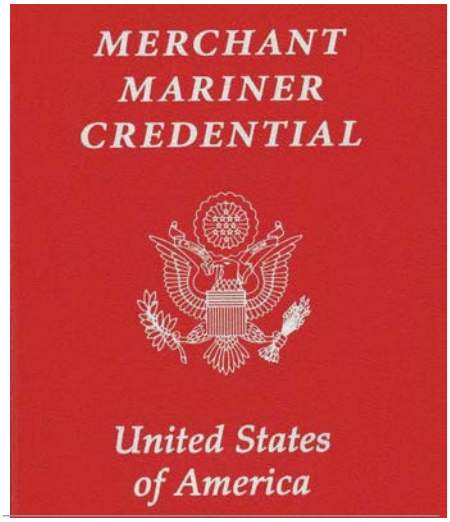
> *When local colleges are booked, we use Chouest or we go to training programs in Florida.*

> *We utilize Seaman's Church in Texas, which is attracting Louisiana companies.*

> *We have to use 25 percent of our training budget on housing and transportation when we can't use local colleges, which means less people will receive training.*

CHAPTER 3: MARITIME TRAINING

IN LOUISIANA

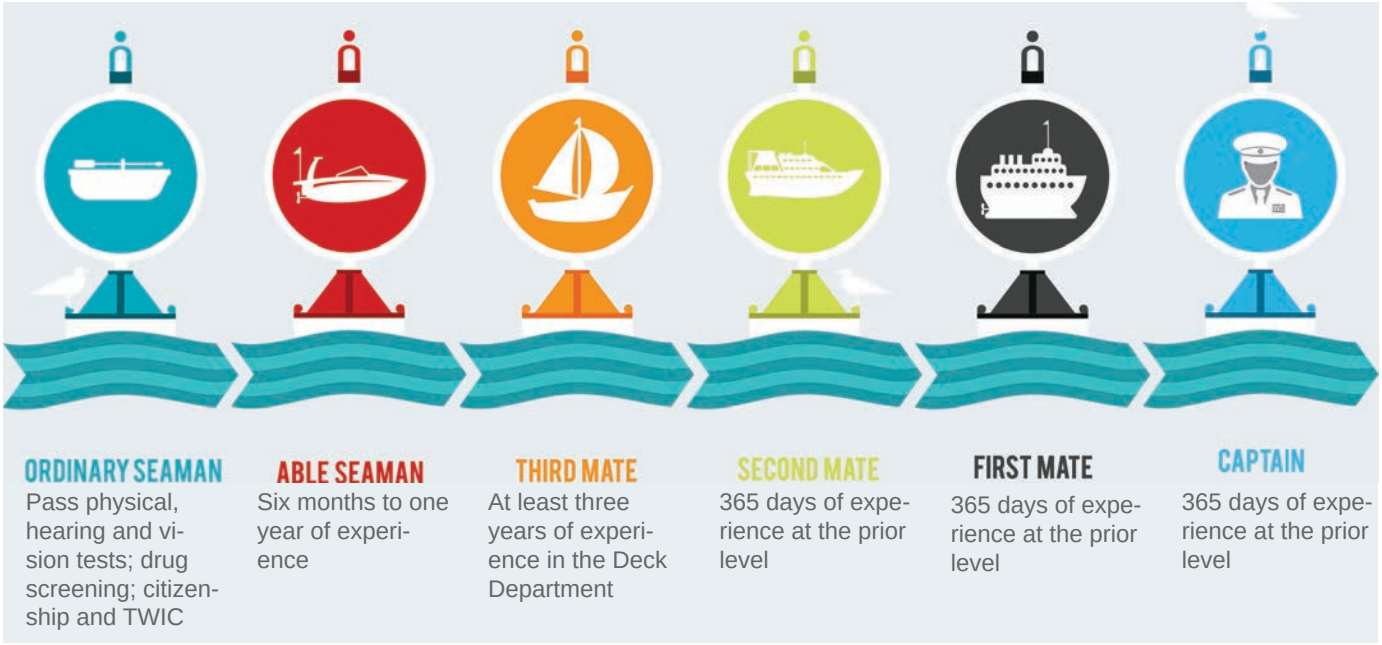


Today, the National Maritime Center of the Coast Guard services more than 250,000 US mariners with individual licenses known as the Merchant Mariner Credential (MMC).

In 1920, Congress passed the Merchant Marine Act with stringent requirements that only Americans build the ships, man the vessels, and move the cargo between US ports. Also known as the Jones Act, the legislation was crafted with the aim of promoting both economic and as well as national security. As recently as December 2014, Congress reiterated support for the Jones Act and for the "strong domestic trade maritime industry, which supports the national security and economic vitality of the United States and the efficient operation of the United States system."[38]

The Coast Guard began regulating maritime safety of the domestic fleet during World War II. Today, the National Maritime Center of the Coast Guard services more than **250,000 US mariners with individual licenses known as the Merchant Mariner Credential (MMC).** The MMC is a US Coast Guard-issued license required for all active mariners to denote their qualifications, and it is valid for a five-year period. Similar to a passport in its appearance, each page is marked with the additional licenses, certifications, competencies, and endorsements earned by the mariner to indicate his qualifications and status. **The MMC encompasses the international Standards of Training, Certification, and Watchkeeping (STCW)** required for mariners on certain large vessels that operate outside US borders.

To earn an MMC and the appropriate credentials as he or she advances along a career path, mariners must complete regular training from course providers approved by the US Coast Guard. This is required of mariners ranging from able seamen and mates to captains and engineers. Licenses also periodically expire and require additional training, even as new requirements are placed on mariners, as well. For example, all mariners working on ships with US flags are required to obtain a Transportation Worker's Identification Credential (TWIC) from the US Department of Homeland Security to verify their citizenship and pass a security screening.[39] In addition to the training required at every level, the following illustrates the experience required on a sample career path to captain:



PRIVATE MARITIME TRAINING PROVIDERS

Interviewees note there are a number of private maritime training providers in Louisiana in addition to the companies with in-house training capacity, such as:

- **Houston Marine Training Services** was established in 1972 and maintains its primary training center in New Orleans and has authorized centers across the United States for professional maritime certification.
- The **Maritime Pilot's Institute** in Covington is a non-profit training organization owned by pilots in Baton Rouge and New Orleans.
- The **Maritime Training Institute** is a new facility near Houma with technologically advanced equipment and simulators, some that are unique in Louisiana, offering various courses in mariner certification, vessel control, and navigation.
- **Martin International** is based in LaPlace and has provided US Coast Guard maritime training since 1982.

In some cases, new coursework is required as well. The STCW international standards were updated in 2010 with various new training provisions that all maritime workers must meet by January 2017. A backlog of requests for new training is a nationwide problem, as evidenced by the new security endorsements that go into effect in July 2015. The original deadline from the US Coast Guard to comply with heightened security certifications was originally scheduled for 2014, but mariners were not able to access the training in time.[40]

State Efforts

Although public officials interviewed from various state agencies recognize a general need to increase the numbers of skilled workers for maritime positions, **there appear to be no state training programs for this population outside of the higher education system.** The only possible exception would be the use of Incumbent Worker Training Program (IWTP) funds by individual companies in the Louisiana maritime industry, which appear to range between $5.5 million and $6.5 million annually.[41]

Louisiana Economic Development (LED) has identified "ultra deepwater" as part of what the agency considers the next wave of oil and gas opportunities that would create jobs in Louisiana over the next 20 years, an analysis known as the Blue Ocean strategy. The agency notes the state's natural geographic advantage, the fact that industry is already present here, and technological breakthroughs that will lead to industry growth. As part of the state's Blue Ocean strategy, LED can target particular projects with discretionary incentives, but these tend to be project-specific rather than direct or general support to make the state competitive across the board in an industry sector.[42]

FastStart, LED's award-winning workforce training program, offers customized employee recruitment, screening, and training free of charge to qualifying companies creating new jobs in Louisiana. In 2014, FastStart funded a 10-week pilot program in shipfitting. FastStart provided South Central with the necessary equipment, recruited and paid two instructors, and enrolled 15 students—the number that Bollinger Shipyards was prepared to hire if students were able to pass the physical and drug tests after the training. Nearly half of the 15 students dropped from the program by the halfway point in part due to the rigor in the curriculum, but Bollinger did hire graduates from the inaugural class. FastStart reports significant interest in the pilot from other ship-building companies with workforce needs and believes this type of effort can be shifted successfully to a two-year school that charges tuition.[43] However, another FastStart maritime training program has not yet been announced.

Officials from the **Louisiana Workforce Commission (LWC)** indicate that no maritime training is conducted or funded by their agency today, apart from IWTP grants for individual companies.[44]

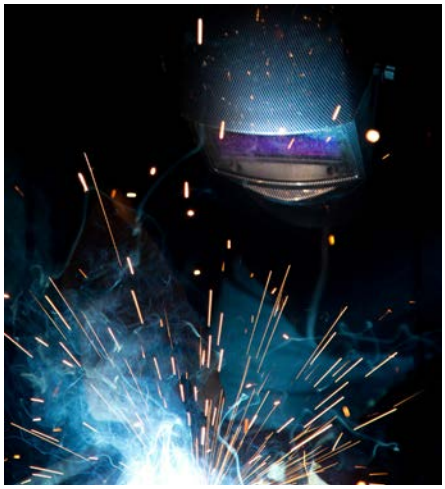
INDUSTRY AND GOVERNMENT SOLVING URGENT LOUISIANA CRAFT WORKFORCE NEED

In March 2013, LED, LWC, the Louisiana Department of Education, the Board of Regents, LCTCS, and the Associated Builders and Contractors came together to form a Task Force to solve urgent workforce needs related to the unprecedented industry growth in the state. $100 billions in plant expansions and new facilities were announced in recent years with a need for an estimated 90,000 new industrial craft workers through 2020. The Task Force found that LCTCS, ABC, and high schools can produce 18,000 entry-level craft workers each year, necessitating recruitment from various groups including veterans, ex-offenders, and college dropouts.

In just a few months, a detailed plan was drafted by stakeholders and approved by the Louisiana Workforce Investment Council. The plan encompasses the following:

- Policy changes (i.e. condensed courses) and public funds to increase training capacity where necessary
- Actual and potential funding sources including federal grants (Perkins or Trade Adjustment Assistance) as well as state workforce training "rapid response" dollars, capital outlay, and General Fund
- Strategies to increase student support, ranging from private industry scholarships to Memoranda of Understanding between public and private training providers on space, to policy changes related to Pell grants to authorize their use in short-term training
- Perhaps most important, after lengthy discussions, a standard curriculum agreed upon by all public and private training providers based on a national model and portable credential

LED FastStart has since created a Certification 4 Manufacturing (C4M) that aims to meet the basic needs of manufacturing companies and introduce individuals to possible career paths after they complete C4M such as welding, process technology, and machining. It is offered in several community colleges and high schools around the state, and FastStart notes "Students who successfully complete this certification are often guaranteed job interviews with employers" or they can pursue an AAS in Industrial or Advanced Manufacturing."[45]



LCTCS Maritime Training

While some maritime training courses are offered across two-year colleges and four-year universities statewide, t**he vast majority of maritime training takes place in three institutions within LCTCS:**

- Delgado Community College in New Orleans
- Fletcher Technical Community College near Houma
- South Central Louisiana Technical College in Morgan City

These programs are training workers in basic marine safety and survival required by federal regulations and company standards, as well as more specific maritime courses such as Bridge Resource Management, Celestial Navigation, Radar Observers, Tankerman, and more. **Nearly all of these courses are taken individually and tailored for licensing and credentialing requirements and do not necessarily represent a progressive path toward a degree.** In practice, each course completion can build upon the other so that when combined with seagoing experience, an ordinary seaman may be eligible to become an able-bodied seaman, for example, moving up the career ladder via licensing. In 2014, Delgado reports 5,416 participants completed courses at the Maritime, Fire, Radar, and Industrial Training Facility. Similarly, South Central reports 2,864 courses completed and Fletcher reports 846.

However, as illustrated in the table below, very little college credit is issued by Louisiana technical schools for performance of maritime coursework, nor is there a standard nationally recognized industry-based certification for maritime training in Louisiana. Such low figures indicate just how few students are seeking out training on their own to enter the industry. In fact, the training administrators on each campus estimate **that 90 percent of their courses are paid for by industry for their existing employees.** Officials note it is very rare that a student approaches the program looking for college credit, preferring to immediately go to work. Students enrolled in maritime training are traditionally not students just graduating from high school, but older individuals – many that already have a job.

Of note, only one four-year university in Louisiana offers a Bachelor's degree specific to the maritime industry: Naval Architecture and Marine Engineering at the University of New Orleans, which reported 15 completers in the 2013-2014 academic year.

Degree[46]	Awarded in 2013-2014	Subject Area	Institution
Certificate of Technical Studies (1/2 year-1year)	0	Commercial Diving	South Central TCC
	0	Marine Science/Merchant Marine Officer (able seaman and bosun's mate)	South Central TCC
	0	Marine Repair Specialist	Central La. TCC
	0	Industrial Marine Elec. and Hydraulics	South Central TCC
Technical Diplomas (18 months)	0	Marine Science/Merchant Marine Officer (master seaman)	South Central TCC
	0	Electrician: Marine	Delta CC
	10	Marine Diesel Engine Technician	Fletcher TCC
	1	Industrial Marine Electronics Technology	South Central TCC
Associates (2 years)	0	Marine Transportation	South Central TCC
Bachelors (4 years)	15	Naval Architecture and Marine Engineering	UNO
Graduate-level Certificate	0	Ocean Engineering	UNO
Masters	0	Ocean Engineering	LSU

Delgado Maritime, Fire, Radar, and Industrial Training Facility

Delgado has a historic legacy of maritime training. The school produced an estimated 20,000 workers to build the Higgins Landing Crafts and PT boats for World War II. Delgado's training assisted workers for military construction at the Avondale Shipyard for decades thereafter. This shipbuilding legacy is being supported now by a $10 million US Navy investment in an advanced manufacturing center for shipbuilding and other industries as well. While much of these funds are being utilized for curriculum, the State and private donations have raised another $11 million to revamp the existing facility in New Orleans into an advanced manufacturing center of excellence.[47]

At the same time, for over two decades, Delgado has operated **the Maritime, Fire, Radar, and Industrial Training** facility currently located in New Orleans East. The program offers US Coast Guard-approved basic and advanced courses in firefighting, STCW basic safety, hazardous materials, emergency preparedness, leadership and managerial skills, water survival, medical care, vessel security, comprehensive radar, apprentice mate/steersman, towboat and offshore simulation, and other classes. The courses range in length from one-half day to 18 days and ALL are non-credit at Delgado. Industry pays tuition that ranges from $120 for Basic First Aid (one day) to $850 for Basic Safety Training (five days).[48]

Administrators note that **all of their programming is directly tied to industry demand, either through contracts or the certifications required by law for their workforce.** Some courses are completely conducted due to a contract with a company, and some companies are billed based on how many students they send. Delgado also offers customized training for groups.

Administrators describe their program as "nimble and flexible" because it is non-credit and not tied to a semester schedule or other rigid requirements. They run classes seven days per week and describe their courses as full, but note that they regularly open more classes as needed by industry. Delgado's maritime program maintains an industry advisory board that meets every six months as a group, but officials note they are in regular contact with their board members.

One challenge discussed by administrators is the ability to find qualified instructors. The six-figure salaries in industry are simply too lucrative for most experts to leave the field and come to teach. There are 29 part-time adjunct instructors at Delgado's maritime facility today and no full-time faculty. Some are employed in the industry and work at the college on their days off and roughly 10 percent are retired industry personnel. All of the instructors have multiple certifications and degrees, and they are always looking to recruit more. In a unique partnership with the Louisiana Chemical Association (LCA), information on teaching and faculty positions is provided to retiring employees that is beginning to bear fruit.

Another challenge to expansion in recent years has been constraints on the physical space, as Delgado utilizes a number of modular classrooms now alongside the 3-acre fire field and 10,000 square feet. Delgado's maritime program is now preparing for a dramatic expansion into a new facility funded with Act 391 (2007) bonds. The $6.7 million project is scheduled to break ground in February 2015 and officials are already consulting with industry on the equipment and other specifications for the new space, which will double in size. Another two acres will also be added to the fire field, and upgrades will be made to radar labs and simulators.

When asked about partnerships with high schools, Delgado reported that none currently exist. They are in preliminary conversations with one or two public and private schools in Orleans and Plaquemines Parishes to potentially offer certifications to high school students, but nothing formal exists yet. Administrators are aware of the state's new JumpStart program to bring together K12, post-secondary schools, and industry and are hopeful it may open new doors for students to train at Delgado.

South Central Louisiana Technical College Marine/ Oil and Gas Center of Excellence

The South Central Louisiana Technical College has three campuses in Thibodaux (Lafourche Campus), Morgan City (Young Memorial Campus), and Reserve (River Parishes Campus) with extensions at the Galliano Service Center in Cut Off and what is known as the Marine/Oil and Gas Center of Excellence with waterfront access in Morgan City. According to the LCTCS administration, South Central has served marine and oil-and-gas industry needs with custom training programs, Incumbent Worker Training Programs (IWTP), and industry-based certificates for some time; initial marine training began in 1960 explicitly to service the needs of local industry. **In 2014, South Central ranked No. 3 in the nation for the number of one-year certificates awarded.**[49] In fact, officials note they produce the most marine-related completers in the nation at South Central – with 2,864 in 2014 alone – and many license plates are out-of-state on campus.

The vast majority of completers represent a diverse array of courses in marine operations such as personal survival techniques, basic firefighting, lifeboatman, crane operator, helideck crew member,

vessel security awareness, rigger, tank barge dangerous liquids, radar observer, bridge resource management and USCG merchant marine courses (master/mate, apprentice/mate, able seaman, etc.). LCTCS system officials note that industry-based certifications are preferred to Technical Competency Area (TCA) certificates where there is an equivalent, and TCAs are being phased out where there is not a major impact.

South Central also offers a Technical Diploma and a Certificate of Technical Studies in industrial marine electronics technology where for-credit courses include introduction to semiconductors, industrial marine hydraulics, remotely operated vehicle, and other specialized lecture and lab classes. The program covers standards and licensing requirements of various national associations such as the Federal Communications Commission and the National Electric Code. A Certificate of Studies is offered in Commercial Diving at South Central as well, requiring 20 credit hours where students are in classrooms and also experience actual underwater work conducted by divers in oilfield operations.

Most recently, South Central has added an Associate of Applied Science in industrial maintenance technology where courses build upon each other to provide a TCA, then a Certificate of Technical Studies, then a concentrated area for a Technical Diploma, and finally the two-year AAS degree. Both core courses, such as Algebra, and specialized coursework such as blueprint reading and basic electricity are required. There are now 21 students enrolled in a marine transportation degree program at South Central, as well, which began in 2013.

As noted above, industry was the catalyst for the creation of maritime training more than 50 years ago at this college. A Maritime Advisory Group meets twice per year with regular interactions with industry in between. Administrators describe industry as proactive in reaching out to the colleges when their minimum standards or training criteria change. Instructors are required to meet with industry at least four times annually by South Central and the Council of Occupational Education that certifies the programs. The chancellor at South Central is a former boat captain with two decades of experience, as is the maritime program director, providing enormous credibility to the college.

Much like Delgado, administrators note 90 percent of courses are sought and paid for by industry on behalf of workers they already employ. South Central works largely with new hires who cannot begin work until the requisite safety training is completed. Coursework is flexible, and classes are added at industry's request and on industry's schedule. Administrators note that companies call "when the boats are coming in" to book training and provide billing information.

All of the staff at South Central tend to wear "multiple hats" and fulfill a variety of functions, according to officials.[50] Similar to Delgado, **recruiting and retaining qualified faculty is a major challenge.** The seven faculty are required to have at least four years of practical and often a captain's license, yet salaries are too low at the college to be competitive with the private sector.

The average age of students in the marine program is 32, and more women are participating every year. No high school diploma is required, although students must meet basic USCG requirements such as citizenship. Individual courses for industry range in price depending on the length and curriculum, from $188 for Safe Gulf (12-hour prerequisite basic safety course) to $527 for Radar Observer Unlimited (40 hours) to $1,065 for Apprentice Mate/Steersman (104 hours).[51]

For students that are seeking for-credit programs at South Central, tuition and fees apply that would be typical in two-year colleges. For example, the AAS in industrial maintenance technology will cost an in-state student a total of $7,255 and an out-of-state student would pay $16,473.[52] South Central students are eligible for TOPS and for TOPS Tech, although the maximum annual award is $1,892.[53] South Central officials note that about half of their students receive Pell grants from the federal government and estimate that nearly 50 percent of enrolled students are "self-pay."[54]

> *"We are successful because we do what industry wants. We don't wait for them to ask. We don't study it. We just do it…even with sweat equity when required.*
>
> *—Fletcher/South Central Chancellor and Former Boat Captain Earl Meador*

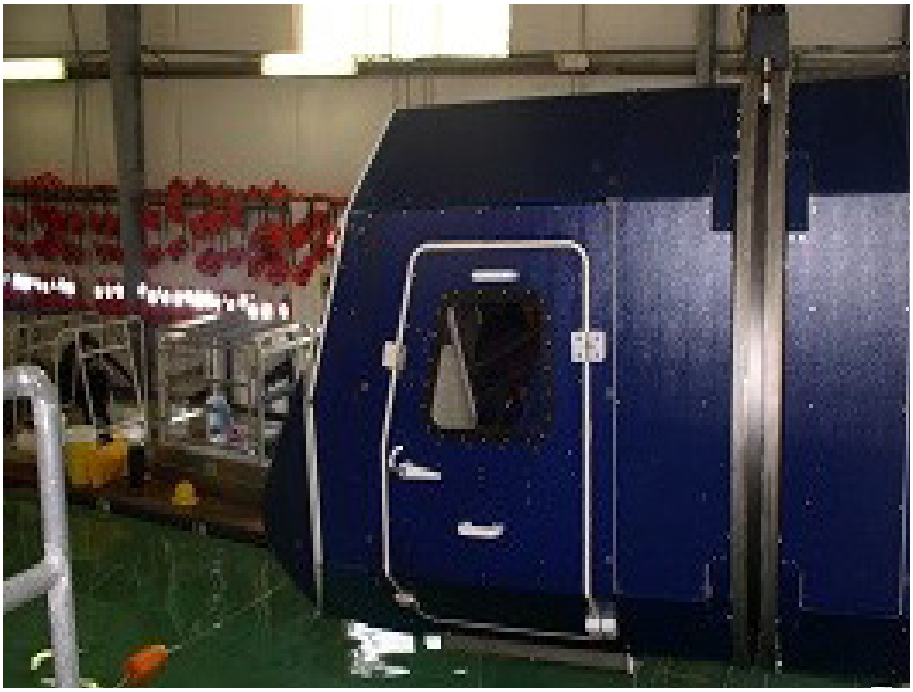
The program equipment is reportedly in good condition with significant industry contributions through direct support, donations, or IWTP grants. Candy Fleet built the pool used for water survival classes, SEACOR Marine funded the building, and Tidewater Marine supported the simulator. One of the most utilized pieces of equipment on the campus is a Modular Egress Training Simulator, which teaches students how to survive a helicopter crash in the water. The helicopter egression, the HUET, was provided by The Wood Group and Universal Sodexho at a $450,000 cost. Officials note that roughly a quarter of the Deepwater Horizon workers who evacuated the platform had been trained on the simulator—one student specifically pointed to this emergency training as critical to survival.[55] More than 40 people a week train on this equipment.

The school is also benefitting from the Act 360 bond issue by the state, which directed $3.78 million for a new two-story classroom structure for marine operations training at South Central.[56] School officials note they have a portable $25,000 building with $750,000 of equipment right now. As the program expands and technology improves, administrators do anticipate adding a bridge simulation package, an electronic charting display, and a dynamic positioning lab over the next couple of years.

Of particular note, **South Central should be recognized as a statewide model for K12 workforce partnerships.** The college offers a marine-based curriculum to high school seniors in St. Mary Parish called Go Safe. When the student graduates from high school, he/she is awarded an Industry Based Certification and are employable on Day One. Students are able to see commercial divers in action and meet welders and drafters through company partnerships. Both public and private schools are participating with bus transportation provided by Franklin to South Central's campus, while the college sends instructors to sites in Morgan City. South Central administrators note they are attempting to expand into Lafourche and Terrebonne parishes, and during the course of this research, a Jumpstart network was established in this region to do exactly that.

Fletcher Technical Community College

Fletcher Technical Community College near Houma, La., represents a growing maritime program with 846 completers in 2014. The college's main campus is in Schriever, but maintains several other sites including the Louisiana Marine and Petroleum Institute (LAMPI) in Houma as well. Last year, **the leadership of South Central Louisiana Technical College merged with Fletcher** to maximize efficiencies given the short physical distance between the two schools and similarities in program offerings and student population. By all accounts, **this alignment has proved effective in saving costs, eliminating duplication, scaling up models and best practices, improving coordination, and enhancing industry's involvement.**



The Marine Division at Fletcher offers courses in marine operations and nautical science. The marine courses are largely non-credit and are similar to Delgado and South Central with such offerings as basic safety, fire protection, personal survival with HUET, rigger, deck handling, and helideck crew member.

In addition, Fletcher offers a Marine Diesel Engine Technical Diploma

and Certificate of Technical Studies with for-credit lecture and lab courses that build upon each other, including engines, basic hydraulics, drive systems, and marine cooling systems for example. Similarly, the Nautical Science program offers a Certificate of Technical Studies in Basic Seamanship and a Technical Diploma in Intermediate Seamanship with lecture and lab for-credit coursework.

Fletcher initiated an Integrated Production Technologies (IPT) program in 2010 in recognition of the increasingly technical skills required offshore, particularly in deepwater. Graduates are prepared to be production technicians in the oil and gas industry, specializing in instrumentation, automation, computer, electrical, mechanical, safety, and process systems. Although not defined as a maritime job per se, the IPT program is targeted for expansion to fill deepwater jobs with significant private and public partnership through the Louisiana Mid-Continent Oil and Gas Association and individual companies. Fletcher offers three IPT degrees today: AAS in Integrated Production Technologies; CTS as a Production Helper (one year); and TCA in Introduction to Production Technology (less than one semester).

Prior to the consolidation of leadership, marine programs were offered on a more typical semester-style schedule, which led to some complaints by industry that Fletcher was not meeting its needs. **Marine Operations courses are now offered on a continual basis through an open enrollment program.**[57] Fees are per course, ranging from $145 for incipient firefighting to $1,500 for a master of towing. Of note, non-credit courses and marine classes do not quality for any forms of college-offered payment plans. Fletcher students in degree programs are eligible for TOPS and for TOPS Tech, although the award is capped at $2,922 annually.[58]

LOUISIANA PORTS AND THE MARITIME WORKFORCE

As noted in the introduction to this report, the ports of Louisiana are an integral component of the maritime industry and also recognize the workforce challenge. The Port of New Orleans hosted a maritime workforce summit in October 2014 in partnership with the University of New Orleans Transportation Institute where industry representatives and state agencies outlined available jobs. Port officials are visiting model maritime programs in other states, particularly those with a pipeline from K12 through four-year degrees. The Port of New Orleans is reaching out to public and private K12 schools in the area to introduce the industry and build skills.[59]

Of note, although the leadership of the two colleges are consolidated, **program requirements continue to vary slightly across campuses.** For example, a Naval Seaman endorsement requires 46 hours on a vessel at South Central, but only 40 hours at Fletcher. The US Coast Guard does not specify a minimum number of hours, although the agency does require a student to start and finish at the same training program. In sum, there is neither a standard curriculum nor fee schedule across Louisiana's maritime programs despite very similar course offerings. During the course of this research, officials at the institution began to standardize course hours and fees, but noted it is a lengthy process due to approval requirements of the US Coast Guard.

Fletcher maintains three full-time faculty and four adjunct faculty in the maritime division. According to some industry interviews, Fletcher's space is currently under-utilized for maritime training. Of note, a 30,000 square foot facility was recently constructed in East Houma with a $4 million investment by BP matched by the State of Louisiana to house lecture rooms, computer labs, simulators, and an equipment lab – largely for the IPT program.[60] However, officials note that the South Central institution actually purchased new helicopter training equipment for Fletcher as a result of a demand for more capacity resulting from ever-increasing safety standards. The related water survival courses were intended to begin in November 2014 but construction delays have pushed back the start of the program. **This facility represents a unique and model partnership of the private sector, state agencies, and multiple colleges coming together to fulfill industry demand for training on new safety standards.**

CHAPTER 4: SNAPSHOT

POTENTIAL NATIONAL MODELS

An initial scan of national maritime programs revealed at least three models with attributes to consider in Louisiana.

The Southeast Maritime and Transportation (SMART) Center

The Southeast Maritime and Transportation (SMART) Center has received national recognition for its efforts to develop portable credentials recognized by industry, create innovative training programs to meet employer requirements, and provide awareness raising in K12 schools for students, teachers, and guidance counselors. Based in Virginia Beach at Tidewater Community College, SMART is the only STEM-focused workforce training program for the maritime industry that is funded by the National Science Foundation's Advanced Technological Education Center. The development and publication of career pathways in the maritime industry are truly impressive. In clear, simple flow charts, any student or parent can understand the steps required to obtain basic training and credentials, the jobs available and tasks performed in each position, and the salaries and quality of life afforded in each career. All segments of the regional industry participated in detailed, prolonged discussions to develop the maritime academic pathway: pleasure craft and boating, shipbuilding and repair, ports and logistics, and seagoing). Apprenticeships for course credit is another important component of the training as a way for employers to "get their workers on an accelerated academic and career pathway, not just a workforce training track that paralleled an academic track." The SMART Center has dramatically increased enrollment and completions in a very short time period as a result of a comprehensive, industry-driven, student-focused approach.

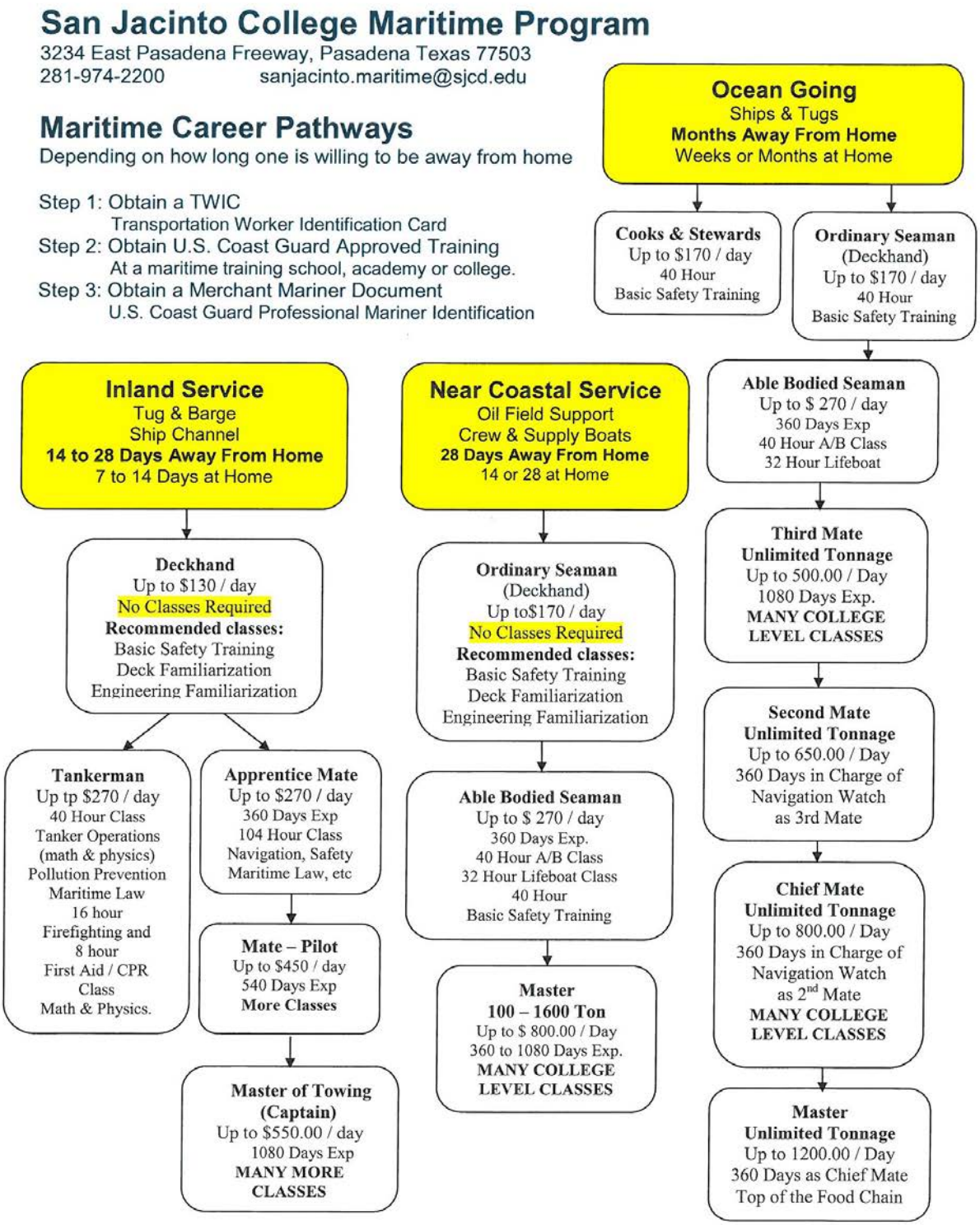
The Maritime Training Center in Mobile, Alabama

The Maritime Training Center in Mobile, Ala. was created by the state workforce agency to meet the growing demand for skilled workers in the maritime industry in the region. A 67,000 square-foot, $12 million state-of-the-art facility was built by the state in 2010 that features classrooms, computer labs, an electrical lab, a non-destructive testing lab, 60 welding booths, and various specialized equipment such as a 10-ton overhead crane and rigging for safety training. The facility shares space with Austal USA, which announced the addition of 1,000 jobs to their Mobile operations in 2012. Maritime employers were consulted and engaged throughout the development of the program and construction of the facility. Today, hundreds of workers are trained annually in various short and long-term courses, which are offered free of charge to Alabama citizens aged 18 or over with a high school diploma or GED who can apply online for a limited number of slots in specific courses. In addition, companies can apply on behalf of groups of their employees for specialized classes such as Aerial Lift Safety, NDT Magnetic Particle Testing, or AutoCAD Skills Assessment. If a company simply registers with the Center, then they can request particular courses at particular times for their workers, day or night. The curriculum and credentials are certified by the National Center for Construction Education and Research (NCCER), providing graduates with portability nationwide.

San Jacinto Maritime and Technical College near Houston, Texas

The San Jacinto College Maritime and Technical Training Center near Houston, Texas, was created in 2010 with support from the Texas Workforce Commission and has experienced phenomenal growth. Officials recognized that industry was paying for travel and housing costs for thousands of mariners required to frequently upgrade their licenses with training in other states. Designing a program from scratch has certain advantages such as replicating the curriculum from established programs with high industry satisfaction; San Jacinto reportedly borrowed from several training programs in Louisiana. However, administrators also established clear career pathways for blue water, green water, and brown water jobs with USCG-approved courses for certification. Mariners earn credit for these courses that can be applied to two-year degrees for an Associate of Applied Science in Maritime Technology or International Business, Maritime, and Logistics for those who wish to enter at a higher level. The college also created a shipping articulation agreement with Texas A&M University at Galveston for a Bachelor's degree in Maritime Administration as well as transfer options to other four-year universities in the area. Such partnerships – with industry, state agencies, and other public and private colleges – appear key to the fast success of San Jacinto. From the outset, for example, the college partnered with the Mid-Atlantic Maritime Academy in Virginia Beach for curriculum and perhaps more importantly for highly qualified, nationally recognized visiting instructors, most who worked on the industry side for decades. The program is already planning a sizeable expansion less than five years after its start; bonds are funding a waterfront facility at the Port of Houston with state-of-the-art, high-tech equipment to open in 2015. The Texas Workforce Commission continues to provide companies with skills training grants funded by a legislative allocation to hire and train new maritime workers at San Jacinto or to upgrade the skills of existing employees.

San Jacinto College Maritime Career Pathways



CHAPTER 5: KEY FINDINGS

AND RECOMMENDATIONS

The maritime industry has a profound impact on the state of Louisiana, yet is largely unrecognized. Workforce demand is not only anecdotal, but verified in data from both the state and federal government. Maritime career pathways are skilled jobs with above-average salaries, even for those who have no college degree.

Maritime training is somewhat unique and atypical to most technical career paths. Because diplomas and degrees are not required, maritime workers tend to start by finding a job then seek requisite training after the fact. As a result, training programs at public institutions are largely offered as individual, non-credit courses that meet the immediate needs of workers and their employers but do not necessarily develop into a career pathway or lead to career alternatives over time.

The current approach is critically important for industry, and the colleges are meeting that need. The strong relationships with industry and the history of partnership and responsiveness, particularly at Delgado and South Central, cannot be over-emphasized. At the same time, there has been little concerted effort to provide entry points for non-traditional students that may desire a maritime career who are not yet employed, for veterans exiting the military and seeking a new career, and for K12 students or those who want to begin maritime careers at a two-year or four-year college.

To grow the workforce and fulfill the demand, the state training programs will need to adapt to

1. Serve the needs of even more employers with the approach they currently utilize but must scale up.

2. Be an attractive, informed option for students and others not as familiar with maritime careers. The recommendations below attempt to broaden the traditional approach to maritime training in Louisiana to allow the state to substantially increase the number of workers trained and truly meet the untapped potential of this vital industry.

> *"The strong relationship with industry and the history of partnerships and responsiveness, particularly at Delgado and South Central, cannot be over-emphasized.*

01 Promote the Louisiana "Blue Economy."

Defined as "the sum of all economic activity having to do with the oceans, seas, harbors, ports, and coastal zones," the Blue Economy in Louisiana encompasses industries as diverse as oil and gas, logistics, transportation, tourism, seafood, shipbuilding, recreational sports, coastal restoration, and more.[61] It is this diversity that also makes the Blue Economy as a whole largely invisible. With the recent shift of state maritime oversight from the Department of Transportation to Louisiana Economic Development by legislative act, it is possible that this large sector of the economy will receive more attention. Additional promotion of the industry could result in maximizing federal and state support for the industry in both economic and workforce development, while also raising awareness among students, families, and potential workers of career opportunities. Mississippi recently released a Blue Economy study with economic impact data as well as recommendations for state and local government, universities, and industry associations.[62]

02 Convene an industry-driven maritime task force within the Louisiana Workforce Investment Council (WIC) to develop a business plan that substantially increases maritime training opportunities in Louisiana.

Industry-based training must continue and scale up, and it is also imperative to attract new workers into maritime careers or risk losing economic opportunities for the state. The Louisiana Workforce Investment Council (WIC) should convene maritime stakeholders including employers, two-year and four-year colleges, trade associations, ports, and K12 schools among others in a task force format to further identify the types of training in demand and design a plan to systematically meet those needs. Efforts conducted in silos or sporadically will inevitably fall short.

Much like the nationally recognized Louisiana Craft Trade Task Force, a detailed analysis of needs, a mapping of programs, and targeted training expansions must occur in the maritime sector to fill job openings with skilled workers in the years ahead. By all accounts, the Craft Trade Task Force has been of tremendous value and has led to actions in both the public and private sector that are demonstrating immediate results. There is no time to waste in replicating this model for the maritime sector. Much of the recommendations that follow should be further explored through a public-private process and the development of a business plan.

03 Articulate a goal and vision for a world-class maritime training institute.

In drafting a business plan, the stated goal of LCTCS should be to create a nationally recognized maritime training institute. Given Louisiana's prominent position as a top employer of maritime jobs, the state should also take the top spot in training for this industry. The training underway at various schools today is well-liked by industry and well-known in other states, some that have copied the model and the curriculum. However, there is no overarching effort tying the schools together. There is no standard curriculum or requirements for course completion. There is no statewide credential or metric for success. There is little market reach outside the state, despite available jobs.

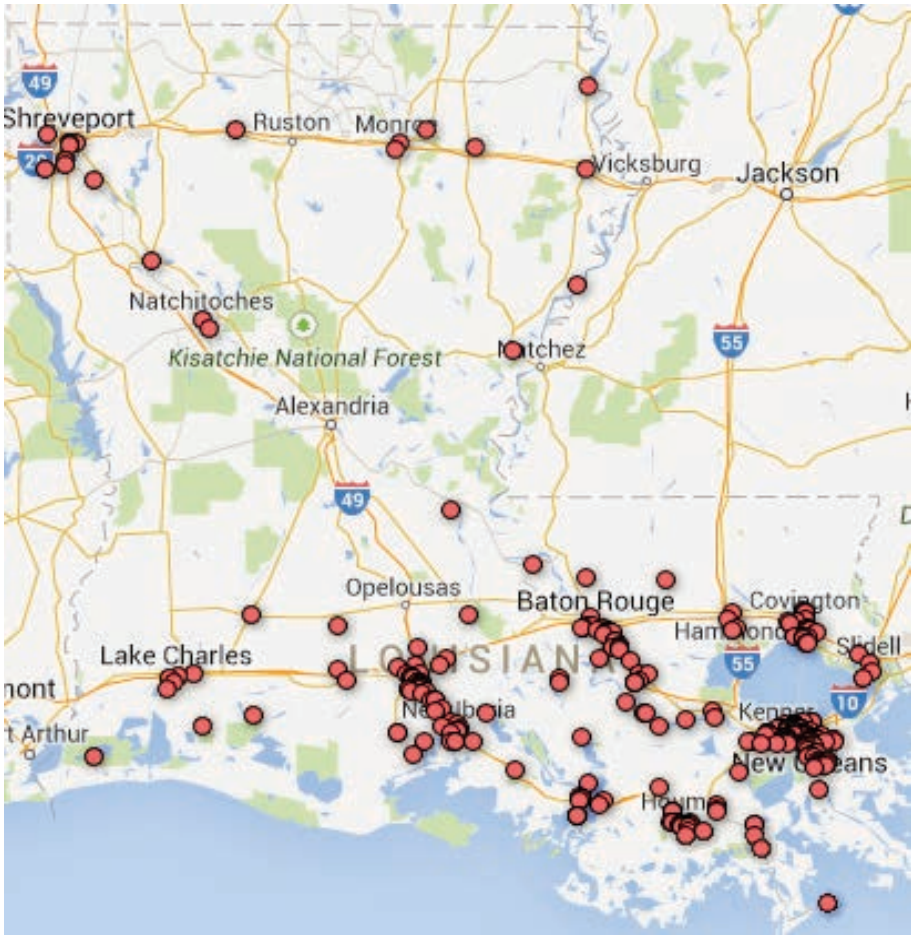
> *"The last thing we want to do is build a program for a new building without a constituency. In fact, it's the opposite.*[63]
>
> *— Dr. Tina Tinney, Northshore Technical Community College*

The concept of a Louisiana Maritime and Petroleum Workforce Training Academy that spans various technical schools in south Louisiana is already under discussion by state leaders, and an LCTCS Center of Excellence application is being prepared. Ultimately, after coordination across campuses is well underway, such an academy may require a new physical space in a centralized location convenient

to jobs and industry, and an initial capital outlay request has been made to that effect. (See map of maritime companies to the right.) Of note, a Center of Excellence designation allows for differential tuition for a higher-cost program such as maritime training. LCTCS administrators note the immediate job openings and competitive wages indicate higher tuition would not necessarily discourage participation, although this possibility should be thoughtfully considered by system leaders and board members as part of the Center of Excellence application process.

As the colleges seek a Center of Excellence designation and prior to breaking ground on any new facilities, the initial work to move toward a statewide maritime academy should begin immediately and include cross-institutional collaboration; the development of clear, seamless career tracks for students; an industry-driven, standardized curriculum that meets needs for employers in blue water, green water, and brown water; and standard fees and tuition for aligned coursework. The recommendations below elaborate on these steps.

In addition to aligning the three institutions with established maritime programs, industry should be consulted on the demand for particular forms of training at new sites such as on the Northshore where there is a high concentration of maritime companies but no technical training available today. Administrators from Northshore Technical Community College report that maritime companies approached the school seeking a program for Remotely Operated Vehicle (ROV) workers in particular. Area companies are



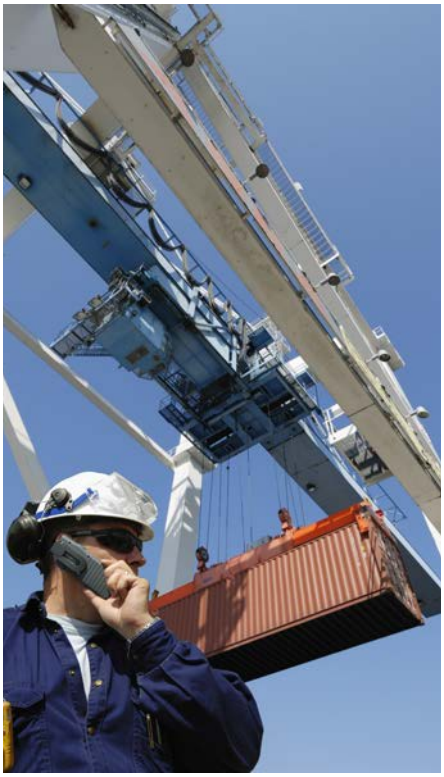
This Google map represents the maritime companies surveyed for this report. 337 maintained physical addresses in Louisiana.

experiencing tremendous growth, but are struggling to fill the jobs and are reportedly bringing in people from out of state and even overseas. Meanwhile, Northshore Technical Community College is building a new STEM facility in St. Tammany Parish with Act 360 funds that appears well-suited to high-tech maritime training. Northshore officials are meeting regularly with area maritime companies and working with national model ROV programs to map an industry-driven curriculum that results in a two-year associate's degree, as well as some IBCs, to present to LCTCS and the Board of Regents for approval. According to Northshore officials, industry has cited their recognition and appreciation of certificate generation by Louisiana colleges, but are asking for more degree programs to "grow a sustainable workforce." Northshore administrators note: "The last thing I want to do is build a program for a new building without a constituency. In fact, it's the opposite."[63]

A Louisiana Maritime and Petroleum Workforce Training Academy will ensure a new program at Northshore does not duplicate the efforts or assets of other public maritime schools, but complements them. The Academy

may even include partnerships outside LCTCS such as K12 schools and four-year universities with relevant degree programs, space, and equipment. Contracts with private maritime training providers to utilize space, share faculty, or book time on specialized equipment should not be off the table. Articulation agreements with four-year colleges should be developed, much like the model programs in Texas.

Only with a comprehensive and collaborative foundation in place that is driven by the needs of both industry and students can the strengths of the colleges be leveraged as a statewide center of excellence for maritime training. A clear vision and goal from leadership, some immediate actions by the colleges, and the development of a business plan in partnership with industry will build that foundation.



04 Expand and improve the marketing of maritime programs to industry, meeting more workforce demand and generating revenue for colleges at the same time.

While industry in the region may be very familiar with college leaders and available training, that may not be true outside of a close geographic and relational area. Of the 50+ maritime survey respondents, less than 20 percent were able to provide feedback on the training at technical colleges, illustrating a sizeable sample size that may not have had experience with the schools.

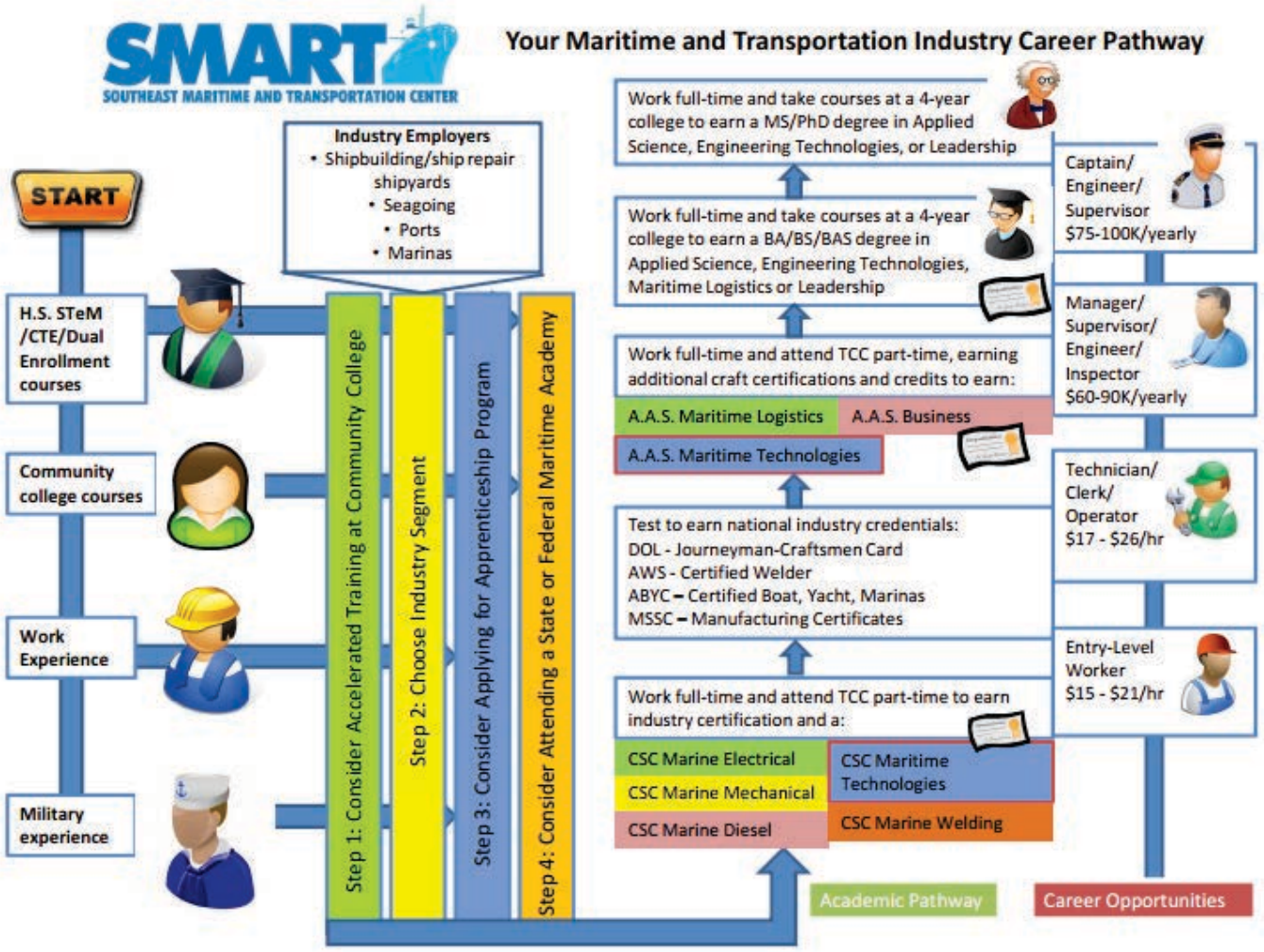
Similarly, LCTCS administrators note that the maritime training programs for industry are revenue-positive and generate substantial funds for the colleges that are actually assisting with the overall budget deficit in higher education. Because safety requirements in particular are mandated, every company must access this training. LCTCS administrators believe they may only be tapping 10 percent of that training, as colleges are generally relying on established relationships with particular companies. The maritime training programs should better market their products and be aggressive and entrepreneurial in reaching out to more maritime companies, particularly as new space is coming online on the campuses.

05 Establish and publicize clear career pathways for maritime jobs.

Similarly, the marketing to students and families is almost non-existent. One industry official notes they do not even have applicants for an industry scholarship program that pays for maritime technical training.[64] Understandably, colleges do not have advertising budgets, but basic steps can be taken to put career information online. The SMART Institute website is a great example, where there are links for students, parents, women, and the military that provide basic job descriptions with salary ranges and responsibilities, outline the skills and education required for each job, and provide career paths.[65] Information is readily available to answer the question “Why Maritime?” and to describe positions such as bridge and lock tender, inside machinist, marine coatings/brush painter, marine welder, rigger, pipefitter, and so on. Numerous videos and testimonials are on the website from employers, workers in all of these positions and more, the trainers in technical colleges, and more.[66]

In addition and more important than promotional materials, LCTCS should work across colleges to ensure that courses build upon each other seamlessly, allowing students and workers to add skills, certificates, licenses, and degrees throughout their career. While some workers may have access to some knowledge through their employer or a family member with experience or even via the US Coast Guard’s merchant marine credentialing program, the colleges should deliberately design stackable credentials, explain the jobs available at each level, and share that information with the public.

As mentioned above, the SMART Center has outlined multiple career pathways customized for potential maritime workers including K12 students, members of the military entering civilian life, and workers who are already in the midst of a maritime career. The pathways show entry and exit points with accompanying jobs and salary ranges. The San Jacinto maritime program has a similar set of pathway options, which shows the differences in blue water, green water, and brown water positions.



A Maritime Career Pathway designed by the SMART Center, one of several pathways they publicize online and share with stakeholders.

STEP 1: In sum, the first step is to ensure the credentials are standardized and stackable across colleges.

STEP 2: The second step is to outline the pathways down to the course level.

STEP 3: The third step is to put it all online for the public and encourage K12 schools, technical schools, Workforce Investment Boards, and others to utilize it as an option for those seeking work.

06 As a complement to industry-funded training, offer more courses for credit as a means for students to climb the career ladder and achieve portable credentials.

Non-credit courses serve an immediate need, are flexible, and can be paid for individually, often by industry. This is something Louisiana is getting right today. In fact, across the country, many colleges are moving more in this direction to better serve industry needs. This simple system is working well and should be scaled up and offered to even more employers.

While popular with those companies that utilize community colleges for training today, it is important to recognize that industry-funded training cannot be the sole path to develop the maritime workforce. More students must seek to enter this career and move up the career ladder if the expanding workforce needs are to be met. Industry is already supporting higher education through tax dollars and then through individual course training for workers. It is only fair that the outcomes of training be maximized to the fullest potential and that all avenues to grow the workforce be explored.

One national study describes the problem as follows, which accurately fits Louisiana's maritime training context:

On the one hand, the lack of accreditation standards confers flexibility: workforce departments are exempt from standards governing such areas as hiring, course content, and course schedules. Partly because they are not funded through the college's formula based on full-time equivalency enrollments, many such departments become highly entrepreneurial in seeking revenue-generating training opportunities. However, this lack of accreditation also creates a significant barrier for students seeking to advance… noncredit students invest their time and energy in learning new skills, but they cannot parlay that investment into the certificates and degrees offered by the for-credit side of the house.[67]

In Louisiana, the problem is particularly important. Non-credit courses are not eligible for TOPS and TOPS Tech – a notable barrier to students and families seeking out maritime training after graduating high school. Similarly, federal financial aid also is not available for courses that do not lead to a degree.

It is no easy task to determine how to offer the thousands of hours of maritime training as "for credit" to students without changing the structure or cost of the program in a way that will negatively affect the successful training underway today. One approach might be for the Louisiana Workforce Commission to recognize a nationally recognized Industry-Based Certification that is standardized across colleges, encompasses key entry-level coursework, and qualifies as a pre-determined number of hours college credit (i.e. Maritime 101). Whatever the approach, the colleges should set a goal to expand for-credit maritime training in tandem with growing industry-funded training. Colleges should explore a process that does not discourage what is working in any way, but allows the workers and students an opportunity for professional growth through degree programs. There should be a credit, non-credit hybrid that benefits both industry and students.

07 Extend outreach into K12 schools – the untapped market for maritime.

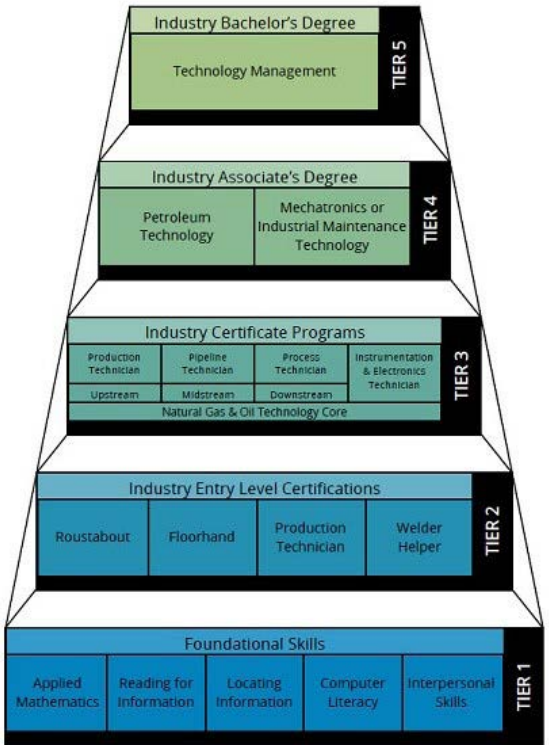
Of the three technical colleges with established maritime training programs in Louisiana, only one has a formal relationships with the local school district to introduce maritime careers. The partnership between South Central and St. Mary Parish Schools is exemplary and should be replicated. As the Northshore Technical Community College begins its programming, a maritime summit is planned for the summer with companies from their advisory board and K12 schools. In addition to direct outreach to local districts, the colleges should seek out regional JumpStart partnerships, where industry and K12 school leaders have come together to define their needs, design curriculum, and recommend and develop certifications and coursework that will make students job-ready on Day One after high school graduation. During the course of the research, a Jumpstart network was created in the Bayou region that includes the South Central Industrial Association, major employers, Fletcher and South Central, and schools in four parishes. At the time of publication, the maritime career pathway was still not developed but the stakeholders are at the table and the work is beginning.

08 Explore the use of federal workforce funds to promote maritime training.

In Louisiana, Incumbent Worker Training Program (IWTP) funds are the primary source of state funding for maritime training outside of the higher education system. Other sources of funds include Rapid Response as well as the recently created WISE Fund, which requires a private match to public investment.

In Texas, however, the state's workforce investment boards utilize federal funds for training. In the Houston-Galveston region, located near the model school San Jacinto discussed above, the Gulf Coast Workforce Board offers "workforce solutions scholarships to support training for some of the region's high-skill, high-growth occupations." The list of approved occupations includes such fields as welders, pipe fitters, industrial machinery mechanics, and oil and gas service unite operators. Of interest, the Gulf Coast Workforce Board also specifies a list of authorized training providers, then publishes an in-depth report card on the performance of those providers.[69]

To complement the efforts of WIBS, the Texas Workforce Commission also oversees a state-supported Skills Development Fund grant, which fulfills a similar purpose as Louisiana's IWTP. The San Jacinto maritime program was awarded a $368,000 grant to train 195 mariners from particular companies that worked together to make the grant request.[70]



A Stackable Credential Model utilized by ShaleNET, a public-private training partnership that spans four states to urgently fill natural gas workforce needs.[68]

ENDNOTES

[1] Louisiana Leads Country in Domestic Maritime Industry, Report Shows http://www.nola.com/business/baton-rouge/index.ssf/2014/04/louisiana_leads_country_in_dom.html

[2] http://www.uschamberfoundation.org/enterprisingstates/#map/L/LA/

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