Testimony Provided to the US Senate Energy and Natural Resources Committee Regarding Innovative Technologies in Advanced Manufacturing

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Madam Chair and Committee Members, thank you for the honor of appearing before you today to talk about innovations in manufacturing at Vigor's Ketchikan Shipyard.

Before I tell you about what we are doing in Ketchikan, a little bit about Vigor.
Vigor is a leading provider of shipbuilding, ship repair and complex fabrication services. With twelve locations and more than 2,500 workers throughout the Pacific Northwest and Alaska, our capabilities range from large vessel construction and repair to high performance military craft and aluminum workboats. We also build quality products for the Hydroelectric, Bridge, Nuclear and Aerospace industries. Our teams share a common goal: providing world-class maritime and industrial services to support our customers and strengthen the communities where we live and work.

Madam Chair, you know, but perhaps not all of your colleagues know, that 9% of Alaska's incoming freight arrives by sea from the lower 48 states and that Alaska's only National Highway System link to the lower 48 states is the aging fleet of Alaska Marine Highway System ferries. Additionally, with salmon being the number one export and fishing being a primary industry in our state, how critical maritime industries are to Alaska. With more shoreline than all of the other states combined and the nation's only Arctic coastline, Alaska is a maritime state.

In terms of the topic of this hearing, I know there will be information provided on new and advanced materials, technologies and techniques. For our contribution to this topic, I want to share specifically about workforce innovations and how that is contributing to something remarkable and crucial in Alaska.

Today, the Ketchikan Shipyard (KSY) is a shining star in the state of Alaska's portfolio of economic development projects. It is a modern, safe, and efficient shipbuilding and repair facility providing year round employment for 200 Alaskans earning family wages in careers in advanced manufacturing. An added bonus is that, in contrast to many Alaskans whose work takes them far away from their families, our employees get to go home to their families every night, a rare condition for many of Alaska's workers.

The KSY is managed and operated through a formal public private partnership between the Alaska Industrial Development and Export Authority (AIDEA), a public corporation and owner of the physical infrastructure; the City and Borough of Ketchikan, providing financial incentives to attract new private investment while the regional economy transitions to the marine industrial support sector; and Vigor, the private sector shipyard operator engaged through an innovative long term operating agreement. A crucial feature and of the Operating Agreement is that rents to AIDEA are made through revenue and profit sharing on Vigor's earnings. All of these revenues flow to a repair and replacement (R&R) fund to assure the KSY is adequately maintained over time. When the R&R account reaches is required minimum level, AIDEA may then return revenue to the community of Ketchikan. Now, with the State facing huge operating deficits generated by the precipitous drop in the price of oil that will likely end revenue sharing with communities from the state's general fund, the value of this feature of the Operating Agreement is becoming apparent.

The beginning of the industrial evolution in Ketchikan began in 1987 when the State of Alaska commissioned the newly constructed KSY to perform maintenance for the Alaska Marine Highway System fleet of ferries, which as I have mentioned, are essential for basic transportation in Alaska. Prior to this date, all maintenance of the state ferry system occurred outside of Alaska. When opened, only a fraction of the planned shipyard infrastructure had been installed and as a result, the yard was closed for several years shortly after opening as two private sector operators failed to earn enough revenue to sustain operations.

By the early 1990s, the forest products industry in Southeast Alaska, then the primary economic sector, began to collapse due to changes in federal forest policy and the State became interested in reactivating the shipyard to not only re-industrialize the Southeast Alaska Region but to provide economic diversity in the state's heavily resource based economy.

In 1994, the State awarded an operating agreement to another Ketchikan contractor and in 1997 the regional forest products industry did collapse creating an economic disaster and triggering receipt of federal economic disaster relief funds. Ketchikan, responding to closure of the Ketchikan Pulp Mill, allocated federal disaster relief funds to create a development plan for the Ketchikan Shipyard and to begin making improvements to the KSY required to establish the facility as viable shipyard enterprise.

Having no prior shipyard operating experience, the new, private sector operator joined with the National Shipbuilding Research Program (NSRP) to meet other shipyard operators and learn about best shipyard practices. The NSRP is a Navy program providing a forum for US shipyard operators to identify competitive weaknesses in the US shipbuilding industrial

base, then work collaboratively to make corrections to reduce the cost of building and repairing Navy ships while improving the productivity of US shipyards.

NSRP has technical panels for all major shipbuilding processes including workforce development. Because Alaska's workforce had no experience in advanced manufacturing and because the KSY project was conceived to provide employment for Alaskans, NSRP projects to develop shipbuilding skill standards and model training plans in the late 1990s were both timely and informative for the new KSY operator.

The NSRP Skill Standards were developed through the functional analysis of shipbuilding processes rather than the traditional approach based on occupational titles. This was necessary because job duties for common occupations varied greatly from one US yard to the next. By focusing on the processes of shipbuilding the knowledge, skills, and abilities (KSAs) required to do work are revealed. By understanding what the KSA's or skill standards of shipbuilding are, then common curriculum for upgrading incumbent skills and training new entry level workers can be standardized thereby reducing the cost and time required for training a knowledgeable and skilled US workforce.

Armed with the nation's first set of Skill Standards for the US shipbuilding industry, the NSRP Workforce Panel tackled the question of developing common curriculum. Acknowledging that development of curriculum for skill training is expensive and time consuming; the Panel scanned commercial sources of technical curriculum developed by industry. The Panel soon identified the National Center for Construction and Education Research (NCCER) as a source of industry developed training material for the construction trades. NSRP panelists audited the material and found that for entry level up to mid-skill shipyard production work the curriculum was well suited (a tape measure read the same way in all industry sectors). NCCER has developed rigorous academic standards, testing and performance evaluations that lead to sequential certifications recognized by employers, colleges, school districts and training providers around the world. The US Dept. of Labor has recognized NCCER certificates suitable for use in registered apprenticeships. In the last few years, NCCER has developed training material specifically for US shipbuilders including marine pipefitting, and structural fitter.

In Ketchikan and Alaska, Vigor has developed a Marine Industrial Pre-Apprentice Program based on NCCER training material. High Schools around the Southern Southeast Alaska region are adopting the Pre-Apprentice Program as a way to bridge the school-to-work gap; as the program develops, students will study and take the knowledge tests in the classroom, then go to local participating employers for performance evaluations to gain workplace exposure.

Ilisagvik College, a tribal college located in Barrow, Alaska is working with Vigor to create an extension campus in the Ketchikan Shipyard. Ilisagvik vocational programs lead to NCCER certificates that translate to college credits for an 11 hour endorsement in Crew Leadership and Supervision, then go on to earn an Associate Degree in Construction Technology. Ketchikan Indian Community is partnering with Vigor to provide technical skill instructors in the shipyard for tribal members who will soon be able to earn college credits through Ilisagvik College as they advance their shipbuilding careers at the KSY. The Federal Highway Administration and Alaska Department of Transportation funds

Maritime Career days at the KSY where over 150 high school students travel to Ketchikan by ferry from outlying communities spend a day in the shipyard being exposed to a multitude of career opportunities.

In response to the transition of the regional economy to marine industrial activities, the University of Southeast Alaska – Ketchikan Campus (UAS-K) is just beginning a $6.6 million dollar overhaul of its technical center to create Alaska's first Regional Maritime Technical and Career Center. In consultation with Vigor and other local marine employers UAS-K has developed a 12 week Multi-Skill Marine Worker program that qualifies Alaskans for jobs on Alaska ferries or prepares them to build and repair ships at the KSY and will soon be rolling out an Associate Degree in Marine Transportation.

Vigor's employee advancement program is based on demonstrated acquisition of knowledge and skills in multiple shipbuilding processes. Recognizing that a stable workforce is good for the employee and good for the employer, Vigor provides training opportunities for employees to learn and be certified in skills outside of their core craft. Possessing multiple skills assures continuous, year round employment as demand for various ship production crafts ebb and flow with work that becomes available. To that end we are exploring strategies for a registered apprenticeship in the occupation of Shipbuilding and Repair. By virtue of shipbuilding's demand for a wide range of knowledge, skills, and abilities, the Shipbuilding Apprenticeship will necessarily be a multi-skilled program based on career paths leading to mastery of a primary ship production process followed by acquisition of ancillary or complimentary skills leading to certification as a Master Shipbuilder.

Leadership development at Vigor Alaska is a high priority. As we encourage and train our industrial workforce to become masters in shipbuilding and repair, we also provide aspiring workers the tools to become masters of themselves and leaders in our community. Progressive leadership coaching produces informed and productive people who take pride and ownership in the ships they build and communities they live in.

Successful evolution of the KSY has acted as a catalyst leading to our State's awareness of the Maritime industries as a discreet collection of interdependent activates and companies that, when taken as a whole, represents Alaska's largest private employment sector. In May of 2014 the Alaska Maritime Workforce Development Plan was published identifying high demand occupations and strategies for qualifying Alaskan's for careers in the maritime sector. Whether it is piloting a modern, at sea catcher processor or an engineer aboard an advanced tractor tug driven by cycloidal propulsion systems, or designing and building modern efficient ferries, Alaska's maritime industries are critical to almost every other industry sector in the state.

The Maritime Administration (MarAD) provides two programs that are important to the US shipbuilding industry. First, the Federal Ship Financing Program (commonly referred to as Title X) provides US Government guaranteed debt issued by US or foreign ship owners for the purpose of financing or refinancing either US flag vessels or eligible export vessels constructed, reconstructed or reconditioned in US shipyards and directly to US shipyards for the purpose of financing advanced shipbuilding technology in privately-owned, general shipyard facilities located in the US. The second program is MarAd's Small Shipyard

Grant Program providing grants for capital and related improvements to qualified shipyards that will be effective in fostering efficiency, competitive operations, and quality ship construction, repair, and reconfiguration. This program has been very effective in assisting US Shipyards to acquire modern tooling and equipment and developing capable shipyard workers. The most recent solicitation for this grant program had a strong emphasis on funding workforce development projects to upgrade the knowledge, skills, and abilities of the US shipbuilding workforce. Shipyards across the nation are eagerly awaiting the award announcements for this highly competitive grant program in mid-April.

The recently enacted Workforce Innovation and Opportunity Act (WIOA) of 2014 fosters regional collaboration by aligning workforce development programs with regional economic development strategies to meet the needs of local and regional employers. WIOA improves services to employers and promotes Work-Based Training and contributes to economic growth and business expansion by ensuring the workforce system is job-driven matching employers with skilled individuals.

A maritime workforce investment fund is being formed in Alaska. This fund is based on the National Fund for Workforce Solution's framework that pools private, public and philanthropic dollars to create patient and flexible capital for workforce development practices enabled by WIOA.

The Southeast Alaska Comprehensive Economic Development Strategy, published in February of this year, adopted strategies to expand and improve the Southeast Alaska Marine Industrial Support Sector talent pipeline and incumbent workforces using tools provided by WIOA and the National Fund framework.

Pending legislation that will be of benefit the US Shipbuilding Industry includes the Maritime and Energy Workforce Technical Training Enhancement Act (S 2053). This bill is becoming known as 'Maritime and Energy Centers of Excellence (COE)' and requires the Secretary of Energy to award grants to expand programs in maritime and energy workforce technical training, and for other purposes. The maritime and energy sectors have many crosscutting skills and demand for skilled and qualified workers.

Regional knowledge and awareness of these legislative and commercial tools for creating innovation in workforce and economic development came about through evolution of the Ketchikan Shipyard.

Today, Vigor Ketchikan is building two new ferries for the Alaska Marine Highway System; the first state ferries ever built for Alaska by Alaskans. Our workforce is young in relation to the national shipbuilding work force, but their enthusiasm and passion for innovation, quality, productivity, and safety is inspiring. Through their leadership and determination, Ketchikan is transitioning to be Alaska's marine industrial support center supporting the North Pacific and Arctic Oceans as envisioned by the public and private partners that came together to support development of the Ketchikan Shipyard.

The models of economic and workforce development emerging from Ketchikan are scalable and distributable and are beginning to be adopted in other neighboring communities seeking economic security through advanced manufacturing. As Alaska

enters another era of economic uncertainty due to falling oil prices, we provide this testimony today to perhaps serve as guide to other regions and industry sectors desiring a competitive and resilient industrial base based on advanced manufacturing.

Again, I am grateful for the opportunity to share with you our story of the industrial evolution that is unfolding in Ketchikan, Alaska. Where the story is not over, we are confident it will have a successful ending.