The Pending Crisis in America's Welding Labor Force

The United States is facing an unprecedented national crisis that could cripple its entire manufacturing sector. Welding is the core of nearly all manufacturing, particularly in the defense industry. The nation's manufacturing backbone is supported by approximately 770,000 welders currently in the U.S. Recent projections by DOL, AWS, Red-D-Arc and multiple industry organizations all indicate a massive loss of over HALF of this welding workforce in the next two to three years, and shortages are already plaguing the industry nationwide. This aging workforce, predominantly from the baby boomer generation, is reaching retirement age faster than they can be replaced, creating a massive void in the industry's needs. This void will be particularly severe in Maine as it faces multiple challenges in backfilling its future welding needs. First and foremost, Maine is more dependent on welding labor because it has more welders per capita than any state in the union. Its labor base is heavily populated with older workers. For over a decade, the younger population has sought higher education with very few seeking careers in welding. Further, the large geographic area coupled with Maine's relatively small population base has led to a dramatic shortage of welders and an inability to coalesce a significant impact on replenishing this shortage. Regardless of training incentives, the population base simply will not support this critical industry and with a national welding shortage needing over 400,000 new welders, the competition will preclude our ability to recruit from other states in sufficient numbers and will be difficult if not impossible to achieve.

National Welding Labor Shortage:

From Red-D-Arc: "The manufacturing skills gap in the U.S. could result in 2.1 million unfilled jobs by 2030, according to a new study by Deloitte and The Manufacturing Institute. The cost of those missing jobs could potentially total $1 trillion in 2030 alone. Because welding is an essential part of manufacturing, many concerns are focused on the welding industry, which has been facing a shortage of workers for several years. The American Welding Society, an organization supporting the welding industry and its workers, predicts that the country's workforce will need 400,000 welders by 2024. Along with machinists, carpenters, and other trades people, the versatile, skilled welder who can handle several welding methods has suddenly become a scarce commodity. The demand for skilled welders has been outpacing the supply and continues unabated, leaving many wondering what happened."

From the American Welding Society: "The welding industry will face a shortage of about 400,000 welders by 2024, according to the American Welding Society. The average age of a welder is 55, and the coming wave of retirements will leave the U.S. with a great deficit in skilled welders in the work force. Older welders are reaching retirement age at an accelerating pace, and younger workers aren't replacing them in sufficient numbers. Approximately 360,000 new welding professionals are projected to be needed by 2027 and over 90,000 average welding jobs need to be filled EVERY YEAR between 2023-2027. Nearly one-half of the establishments studied reported that their welding-related training needs are not adequately met, and this trend will accelerate each year."

Maine's Welding Labor Shortage:

Maine is at the epicenter of this crisis and is particularly vulnerable as it is the state with more welders per capita than any other in the nation. It has a very large group facing retirement age, and the lowest labor participation rate in New England. Major defense industry pillars like Bath Iron Works, Portsmouth Naval Shipyard, and Pratt & Whitney, along with around 150 of their subcontractors, are staring at a debilitating shortage of qualified welders. The big three alone have a projected need for an additional 2,000 workers each year for the next five years.

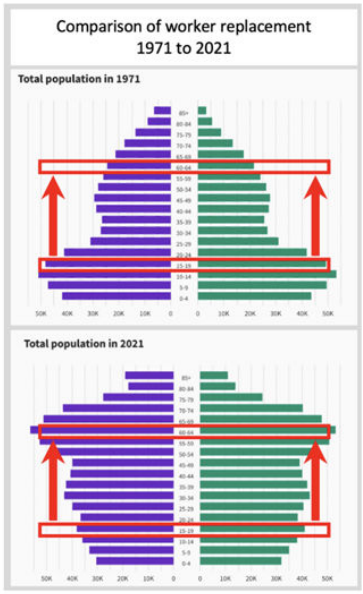
This situation is further aggravated by Maine's small population base and large geographic area. The state grapples with the challenge of an aging population, with over 22,500 individuals retiring in the next five years and a mere 15,600 entering the workforce. For all Maine industries, even with free education and job guarantees, the simple truth is that there aren't enough people to train. Please see the

excellent white paper (link below) detailing the crisis in Maine's workforce and the accelerating nature of the inability to support Maine's largest defense suppliers and their sub-contractors. It's not a "pending crisis" — it has arrived.

President David Daigler of the Maine Community College system recently issued a white paper which clearly shows the severity of Maine's labor problems because of an aging population affecting all skills titled, "A New Era of Workforce Development." (1) Just a cursory look highlights severe problems now and expanding over the next five years: Finding qualified welders from the scarcity of Maine youth to backfill retiring highly skilled welders needed in Maine's defense community on an accelerated basis will be difficult if not impossible. Excerpts from his white paper below:

Demographics and Other Seismic Shifts

Over the past 50 years in Maine, periods of higher unemployment were common, rising and falling with the strength of the economy. Since 1971, unemployment in Maine has averaged 6%, twice reaching 10% and, during the early months of the pandemic, nearly 15%. But the state's unemployment rates are likely to be far less volatile in the coming years as our population continues to age and the supply of available skilled workers continues to decline. One clear indicator of this: post-pandemic unemployment rates have very quickly returned to record lows. In December 2022, Maine's unemployment rate was 3.5%, exactly what it was in January 2020 before the onset of the pandemic.



In Maine low unemployment rates are very likely here to stay, and workers can no longer be viewed as easily dispensable, even when the economy softens. Fifty years ago, when there were 2.5 times the number of young people entering the workforce as there were older workers leaving it, our education and training systems could be fairly inefficient, and employers were often quick to lay off workers during recessions. But today, across the country, there is only one 15– to 19-year-old preparing to enter the workforce for every one adult 60-64 leaving it.

Defense

Maine's defense sector employs over 19,000 individuals at more than 150 companies. Nearly two-thirds of those workers are employed at Maine's three major defense contractors: Bath Iron Works, Pratt & Whitney, and Portsmouth Naval Shipyard. In all, U.S. Department of Defense spending in Maine totaled $3.2 billion in 2021.[xvi]

As threats from China and Russia rise and the U.S. continues to support the war in Ukraine and restock its defenses, defense spending is projected to increase significantly over the coming decade. Already, BIW, Pratt & Whitney, and the Portsmouth Shipyard anticipate needing to fill some 2,000 positions each year, and small manufacturers in the state's defense sector report struggling to find the qualified candidates they need to deliver their critical goods and services.[xvii]

NOTE: U.S. Department of Defense spending in Maine totaled $3.6 billion in 2023.

Maine's defense industry plays a pivotal role in the nation's security. Companies such as Bath Iron Works and Portsmouth Naval Shipyard are integral to the construction and maintenance of the U.S. Navy's fleet, underscoring their importance not just to the state, but to the nation as a whole. The shortage of skilled welders threatens to disrupt the operational efficiencies of these establishments, which could have far-reaching consequences on national defense readiness. Given the strategic importance of these defense hubs, addressing the welder shortage is not merely an economic consideration for Maine, but a matter of national security. This looming crisis underscores the inadequacies of the current training and employment model for welders on a national basis.

The Crisis is Deepening

The following industries will be accelerating their need for welders apart from retirement metrics, creating a perfect storm that will cause an acute shortage of welders throughout the country. Losing half of the welding talent through retirement as predicted certainly will have a devasting effect, but the acceleration of the need for additional welders will greatly increase in several major industries, leading to a shortage of welders throughout the nation's manufacturing sector.

Doubling Grid Size

The DOE's National Transmission Needs Study, released October 30, 2023, estimates that by 2035 the U.S. must more than double existing regional transmission capacity by more than fivefold, see 3 key findings. Secretary of Energy Jennifer Granholm stated July 22, 2024: By 2030, we expect to add the equivalent of over 300 Hoover Dams-worth of clean energy to our grid. See, "The U.S. Needs to Double the Size of its Grid" that states "According to the U.S. Department of Energy, the country will need 47,300 gigawatt-miles of new power lines by 2035, amounting to a 57% expansion of the existing grid."

The need for welders in the area of infrastructure is increasing dramatically particularly in the lighting and pole industry where billions have already been allocated for repairing and building the electric grid. Millions of new steel poles need to be produced, and the major companies like Trinity, Sabre, Valmont are already short thousands of welders and are years behind in production even without doubling and tripling in demand as projected. This industry workforce is very heavily weighted by welding needs. Most plants have 400 to 500 welders, and as capacity demands increase, they will absorb a large portion of any welding workforce capacity.

Accelerating U.S. Navy and Merchant Shipbuilding

The new and accelerating demand in shipbuilding for welders is not only in U.S. Navy vessel production, (see To expand the Navy isn't enough. We need a bigger commercial fleet.) but the additional need for hundreds of new merchant vessels will increase the demand for welders throughout the nation's shipbuilding community.

One of the major impediments to getting the ships done on time has been worker shortages at many of the nation's shipyards. The Wisconsin yard building the frigate, which also built one of the two versions of the littoral combat ship that have been plagued with mechanical issues, has struggled to find skilled laborers, despite multiple programs to recruit and train welders and other workers.

The following publications detail the unprecedented demand for skilled workers in the shipbuilding industry:

1. Congressional Letter to President Biden: A Call to Action for Maritime Strategy and Policy
2. Congressional letter asking for action for Merchant Marine capacity.
3. Politico article showing status of Navy shipbuilding challenges: Navy cancels ship briefings after damning internal report
4. Congressional Guidance for a National Maritime Strategy Please see graph on Page 3.
5. Brookings Institute: To expand the Navy isn't enough. We need a bigger commercial fleet.

Bridge Repair and Replacement

Additionally, bridges need replacement and repair (See President Biden's $5 billion Large Bridge Project Award announced July 17, 2024 affecting 13 major bridges in 16 states.) Bridge repair and replacement will call for several thousand welders when fully in place.

Oil Fields Welding Demand Will Resurface

With a change in administration, our country's energy policy will be dramatically different and many thousands of the best welding talent will be siphoned off into the oil fields as before, as we begin to drill and build new pipelines. These jobs will pay nearly triple existing salary levels now in SIB yards. We

have little ability in this nation today to produce welding talent in sufficient numbers and quickly enough to meet the tsunami that will pirate welders from existing employment to the highest-paying companies. The demand for welders will be everywhere, and Maine's population base will not be able to offset the severe demand placed on SIB welding workforce.

The M.O.S.T. program can and has produced talented welders in a rapid focused manner, and this ability is the quantitive and qualitive benefit to the SIB in the very near future to offset the drain on the welding workforce. With an accelerated program and national recruitment several hundred entry-level welders can be inserted in the SIB within 18 to 24 months.

This small one class program in Portsmouth we are proposing will allow M.O.S.T., its instructors, and management to determine and define the needs specifically for Portsmouth production needs. When these entry-level welders are delivered and proven successful to the Portsmouth Navy Yard (PNY) team, the M.O.S.T. program will then become a potent weapon for fighting off all the upcoming threats outlined above.

SIB will be competing for welders against all these categories as well as the thousands of manufacturers losing their welders through retirement. We leave you with this one chart to show how shockingly behind we are in merchant support vessels vs. the Chinese. Without fuel, food, ammunition, the U.S. Navy vessels become impotent and cannot sustain any long-term engagements at our present merchant support levels.

FACTS AT A GLANCE

U.S.	VS	CHINA
<200 U.S. Flag Oceangoing Vessels	Fleet	>7,000 Chinese Flag Oceangoing Vessels
<5 Orders (2023)	Shipbuilding	>1,700 Orders (2023)
<153,000 U.S. Workers	Shipbuilding Workforce	>600,000 Chinese Workers
<12,000 Merchant Mariners	Mariners/ Seafarers	>1.7 Million Seafarers