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Before the

COMMITTEE ON  
ARMED SERVICES

**UNITED STATES SENATE**

TO RECEIVE TESTIMONY ON EVOLVING WORKFORCE  
DYNAMICS AND THE CHALLENGES FOR DEFENSE  
ACQUISITION AND DEFENSE INDUSTRIAL BASE

Wednesday February 28, 2024

Washington, D.C.

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1 TO RECEIVE TESTIMONY ON EVOLVING WORKFORCE DYNAMICS AND THE  
2 CHALLENGES FOR DEFENSE ACQUISITION AND DEFENSE INDUSTRIAL  
3 BASE

4  
5 Wednesday February 28, 2024

6  
7 U.S. Senate

8 Committee on Armed Services,  
9 Washington, D.C.

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11 The committee met, pursuant to notice, at 9:31 a.m.,  
12 in Room 216, Hart Senate Office Building, Hon. Jack Reed,  
13 chairman of the committee, presiding.

14 Committee Members Present: Senators Reed [presiding],  
15 Shaheen, Blumenthal, Hirono, Kaine, King, Warren, Peters,  
16 Rosen, Kelly, Wicker, Fischer, Ernst, Sullivan, Scott,  
17 Tuberville, Mullin, Budd, and Schmitt.

1           OPENING STATEMENT OF HON. JACK REED, U.S. SENATOR  
2 FROM RHODE ISLAND

3           Chairman Reed: Good morning. The committee meets  
4 today to receive testimony on evolving workforce dynamics  
5 and challenges for defense acquisition and defense  
6 industrial base personnel.

7           This committee has spent several years examining the  
8 various challenges for our defense acquisition system. We  
9 have worked to identify supply chain problems, to pinpoint  
10 shortages in critical materials, and to improve investments  
11 in long lead items for our weapons systems.

12           However, there is nothing more important for our  
13 defense acquisition strategy than our workforce, the men  
14 and women of the Defense Acquisition Corps, and the  
15 personnel in the defense industrial base whom they helped  
16 to guide and oversee. We cannot solve our acquisition  
17 problems without an adequate supply of skilled and trained  
18 workers.

19           This challenge is spread through many sectors of our  
20 defense industrial base and in many geographic areas. From  
21 my own Rhode Island perspective, I often see the workforce  
22 challenges facing the submarine industrial base and the  
23 textile industry.

24           These sectors each have their own unique hiring  
25 challenges, but those are further exacerbated by widespread

1 competition for talent among Federal agencies, between the  
2 Federal Government and the private sector, and even between  
3 the defense industrial base and the rest of the commercial  
4 sector.

5 During today's hearings, we will take a step back to  
6 better understand the broader dynamics at play and consider  
7 how the Department of Defense can or should adapt its  
8 hiring and retention processes to try to address these  
9 challenges. Until we thoroughly identify and understand  
10 the changes happening in the broader workforce, we will not  
11 be able to properly meet them.

12 Many of the defense workforce strains are related to  
13 demographic changes as more Millennial and Generation Z  
14 workers enter the workforce, and many of our baby boomers,  
15 who have been the backbone of the defense workforce for  
16 decades, begin to exit in greater numbers.

17 The younger generations have different demands and  
18 expectations of their employers than previous generations,  
19 especially in the post-COVID landscape. I am concerned  
20 that the Department has not fully recognized this evolution  
21 and has not fully adapted its talent management practices  
22 as a result.

23 The sources of these labor challenges are diverse.  
24 Two-thirds of Americans who lost a full time job during the  
25 pandemic say they are only somewhat active, or not very

1 active at all, in searching for a new job.

2 About half are not willing to take jobs that do not  
3 offer the opportunity for remote work, and we know that  
4 younger Americans are prioritizing their personal growth  
5 over searching for a job, with many saying that they are  
6 more focused on acquiring new skills, education, or  
7 training before reentering the job market.

8 To discuss these issues and help us better understand  
9 how the Department of Defense can adapt its hiring and  
10 retention policies, I would like to welcome our  
11 distinguished panel of witnesses. Mr. Johnny Taylor is the  
12 President and CEO of the Society for Human Resources  
13 Management.

14 Mr. Taylor's career spans more than 20 years as a  
15 lawyer, human resources executive, and CEO in both the  
16 profit and not for profit sector. He is a global leader on  
17 the future of employment, workplace culture, and  
18 leadership. Dr. Simon Johnson is the Ronald A. Kurtz  
19 Professor of Entrepreneurship at the MIT Sloan School of  
20 Management.

21 He is the co-author of the book, Jumpstarting America,  
22 How Breakthrough Science Can Revive Economic Growth and the  
23 American Dream. Dr. Johnson was previously a senior fellow  
24 at the Peterson Institute for International Economics, a  
25 member of the Congressional Budget Office's Panel of

1 Economic Advisers, and a member of the Financial Research  
2 Advisory Committee of the U.S. Treasury Office of Financial  
3 Research.

4 Dr. Julie Lockwood is the Director of Business  
5 Modernization at the Institute for Defense Analysis, or  
6 IDA. An economist with expertise in labor, health, and  
7 computational economics, Dr. Lockwood built and led the  
8 Human Capital Group within IDA, a team of researchers that  
9 used data analytics, machine learning, and applied  
10 econometrics to address Department of Defense personnel and  
11 readiness issues.

12 And we are grateful to have such an accomplished panel  
13 of experts with us to discuss this important issue. Thank  
14 you again to our witnesses, and we certainly look forward  
15 to your testimony. Let me now recognize Ranking Member  
16 Wicker.

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1           OPENING STATEMENT OF HON. ROGER WICKER, U.S. SENATOR  
2 FROM MISSISSIPPI

3           Senator Wicker: Thank you, Mr. Chairman. The  
4 Department of Defense employs more than 700,000 civilians  
5 who is sure that our military personnel are capable of  
6 performing their mission. Their mission is to deter and  
7 win wars to protect our national security.

8           For this reason, the Armed Services committee takes a  
9 special interest in ensuring that the Department of Defense  
10 has every tool necessary to build a civilian workforce that  
11 is capable, innovative, and dedicated to keeping our  
12 country safe. The basic principles of building an  
13 effective work force are simple.

14          The Department of Defense needs to be able to hire the  
15 best people quickly and pay them what they are worth. But  
16 if an employee does not meet expectations, the Department  
17 needs to be able to dismiss that employee and find someone  
18 better. Unfortunately, the laws and regulations governing  
19 the Department of Defense workforce are anything but simple  
20 and efficient.

21          Hiring takes too long even when Congress provides  
22 accelerated direct hiring authority. Pay is often  
23 inadequate, especially in trade provisions such as welders  
24 and electricians who maintain the Navy's nuclear powered  
25 submarines and carriers.

1           The Department also does not pay competitive salaries  
2 for jobs that require extensive formal education, and  
3 everyone knows how hard it is to terminate an  
4 underperforming employee. Those who have spent any length  
5 of time in the Pentagon have a story of an underperforming  
6 colleague who was shuffled around to various offices to get  
7 him out of the way.

8           Similarly, most know a truly exceptional performer who  
9 left the Department of Defense in search of better rewards  
10 for her hard work. The status quo is unacceptable, and the  
11 evidence is everywhere we look.

12           Our public shipyards struggle to attract skilled trade  
13 workers. The Navy is hemorrhaging the civilian mariners,  
14 whose work ensures the delivery of critical supplies around  
15 the world to the rest of the fleet. We cannot hire or  
16 retain enough doctors or nurses to staff our military  
17 hospitals.

18           Cyber professionals leave the Department of Defense in  
19 droves to join other Government agencies or the private  
20 sector. I could go on. The unique mission of the  
21 Department of Defense demands that Congress provides it  
22 exceptional authorities to allow the Department to build  
23 the civilian workforce needed to support our warfighters.

24           The system that governs every other Federal agency is  
25 inadequate for our national defense workforce. Numerous



1 bipartisan commissions and our military's senior leaders  
2 agree. I hope we can use this year's National Defense  
3 Authorization Act to provide legislative tools to achieve  
4 the basic principles of an effective civilian workforce.

5 I would ask the witnesses to help us understand the  
6 weaknesses of the Department's current human resource  
7 system. But more importantly, I hope the witnesses can  
8 tell us what we can do to make the Department of Defense a  
9 more competitive employer. Thank you, Mr. Chairman.

10 Chairman Reed: Thank you, Senator Wicker. Mr.  
11 Taylor, please begin.

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1           STATEMENT OF JOHNNY C. TAYLOR, JR., PRESIDENT AND  
2 CHIEF EXECUTIVE OFFICER, SOCIETY FOR HUMAN RESOURCE  
3 MANAGEMENT

4           [Technical problems.]

5           Mr. Taylor: -- the state of the workforce. Thank  
6 you. SHRM empowers people and workplaces by advancing  
7 human resources practices and maximizing human potential.  
8 We are 75 years old this year, and we have been the trusted  
9 authority on all things work, workers, and the workplace.

10           Our nearly 340,000 HR professionals across the globe  
11 represent nearly 362 million workers and their families in  
12 180 countries. A few weeks ago, SHRM released its state of  
13 the workplace report, which focused on the challenges  
14 employers faced in 2023 and the critical issues we expect  
15 that they will face in 2024 and beyond. The report looks  
16 at four key areas which impact the workplace.

17           First, balancing inflation and talent challenges.  
18 Yes, we want to pay our people more, but somehow the  
19 consumer is pushing back increasingly on paying more for  
20 services and goods. Trading and evolving workforce.  
21 Indeed, both Chairman Reed and Ranking Member Wicker spoke  
22 to the challenges of for the first time we have five  
23 generations in the workplace at once and they have  
24 significantly different needs.

25           Thirdly, we looked at realizing the full potential of

1 artificial intelligence. Quite the debate these days, and  
2 I will spend more time in my introductory comments  
3 addressing that. And then we are struggling with engaging  
4 workers.

5 So, it is just not enough to have the bodies there,  
6 but to engage them is yet a significant challenge. I would  
7 like to talk for just a minute about key findings from our  
8 report. One is inflation was the top concern for  
9 organizations in 2023, and not just general inflation, but  
10 indeed wage inflation.

11 73 percent of HR professionals indicated that this is  
12 their current number one concern. We want the talent, we  
13 want to pay them, but we have got to figure out how to do  
14 so. Secondly, labor shortages.

15 They are another and they were the number two issue in  
16 2023. We have already somewhere between 8, 9, 10, 11  
17 million open jobs at any given time, and that has created a  
18 major concern for organizations. More than two-thirds of  
19 employers have said we simply can't find enough people.

20 There are labor shortages. And then we do need to  
21 reduce the cost and increase efficiencies. And I will talk  
22 a little bit more about how that has directly led to  
23 adoption of AI and other technologies.

24 Nearly 9 in 10 workers believe fair compensation from  
25 current employees, including the Government, the Department

1 of Defense, for example, should be the top priority for  
2 organizations in 2024, yet only 27 percent of HR executives  
3 say this is their top priority. So, a major disconnect.

4 And a quarter of HR Departments are currently using  
5 artificial intelligence applications for specific purposes,  
6 such as recruiting talent, employee training, and  
7 development. So, in 2024, we expect that number will  
8 significantly be increased.

9 And finally, improving people managers, that is, the  
10 people leaders understanding of their roles and developing  
11 more of their what we call soft skills, their not so soft  
12 power skills such as empathy.

13 Top organizational priorities for 2024 are all about  
14 not just getting the talent but retaining the talent. And  
15 what our data tells us overwhelmingly is that 60 percent or  
16 more of employees leave not the employer, but their  
17 manager, their people manager, and thus the challenge for  
18 us.

19 So, let's talk about the labor shortages that we are  
20 all seeing and are specifically impacting the Department of  
21 Defense. HR Departments are being compelled to strategize  
22 to solve for the labor shortages with a market that does  
23 not want to respond in traditional ways. A key focus in  
24 the past was increase salary and that will help you attract  
25 talent. Well, what we know about the younger generation is

1 that doesn't necessarily work.

2 Our data will tell us that employees will say they  
3 will actually leave an employer for less money, to go make  
4 less money if they get to work for a more empathetic  
5 leader. This is the reality of Generation Z and  
6 Millennials, and something we have to take into  
7 consideration at the Department of Defense.

8 The Department of Defense can greatly benefit by  
9 retraining and retaining officers and enlisted personnel  
10 who leave the military and are having difficulty finding  
11 work in the private sector. This is a significant  
12 conversation in the private sector world, I can tell you,  
13 is how do we create opportunities?

14 How do we translate the experiences of people who have  
15 come from the military and from the Department of Defense  
16 into private sector jobs? But that creates an opportunity  
17 for the DOD, because, in fact, you might consider keeping  
18 those people. But returning alone is not enough.

19 We need to train them and train these employees to be  
20 more adaptable, because in today's rapidly changing world,  
21 adaptability is paramount, and SHRM research indicates that  
22 over 31 percent of organizations are modifying the  
23 recruitment strategies, including enhancing social media  
24 presence, advertising, and employee referrals.

25 So, in summary, got a lot more to tell you, but SHRM's

1 testimony today underscores several pivotal areas where  
2 organizations can concentrate their efforts to attract,  
3 retain, and empower the workforce.

4 Very quickly, adopt skills based hiring, invest in  
5 retention, leverage apprenticeship programs, modernize  
6 talent management processes. This is, Mr. Wicker, Senator  
7 Wicker, a real challenge for the Government. And we need  
8 to invest in people managers, upskill and reskill the  
9 workforce, create a culture of learning.

10 The employees want this. They don't want to take the  
11 job and know the job for 30 years and then retire. Create  
12 AI responsibly. It is not enough to just enable the  
13 technology, but to do so responsibly. And then to focus on  
14 human and machine collaboration. At SHRM, we speak a lot  
15 about AI plus HR will equal the new ROI.

16 So, it is not a sum zero game for employees. We have  
17 got to embrace this technology and we think there are huge  
18 opportunities for the Department of Defense. Thank you.

19 [The prepared statement of Mr. Taylor follows:]

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1 Chairman Reed: Thank you, Mr. Taylor. Dr. Johnson,  
2 please.

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1 STATEMENT OF SIMON H. JOHNSON, RONALD A. KURTZ 1954  
2 PROFESSOR OF ENTREPRENEURSHIP, MASSACHUSETTS INSTITUTE OF  
3 TECHNOLOGY SLOAN SCHOOL OF MANAGEMENT

4 Dr. Johnson: Thank you, Senator. I would like to  
5 make three points. The first is about a term I fear you  
6 are going to hear increasingly, which is stranded  
7 expertise. It is a term being used in the tech sector to  
8 refer to the impact of AI in particular.

9 But of course, it is not a new problem. We have been  
10 facing issues with expert people, people who spent a lot of  
11 time acquiring education and training, losing opportunities  
12 and being left behind. These have been a problem since at  
13 least the wave of automation. We have experienced that in  
14 the 1980s.

15 The shock of Chinese imports from the early 2000,  
16 exacerbated this. And in the age of AI, I think we are  
17 going to be seeing much more of this. And of course, it is  
18 overlaid, Senator Reed, with some of the issues we have  
19 talked about in terms of the demographics, I would also  
20 highlight the shift of innovation away from the historical  
21 dispersion of the United States towards the East and West  
22 Coast.

23 And of course, from a broader social, economic point  
24 of view, this is a problem. But my second point is that  
25 this is actually an opportunity for the Department of



1 Defense and a way to think about responding to the problems  
2 both you, Senator Reed and Senator Wicker already flagged,  
3 because the key point is that innovation and technology  
4 develops and is maintained in particular geographies,  
5 around hubs. And we used to have a lot of hubs that were  
6 very dynamic in the United States.

7 Now we have fewer, but that can be addressed. The  
8 analysis we did suggests there is over 100 urban areas in  
9 36 States where 80 million Americans live that are ripe for  
10 stepping up to become fantastic places for exactly the kind  
11 of problems that you are trying to solve and address on  
12 this committee.

13 So, there is potentially available labor. So, there  
14 are already skills. There is no doubt some retraining  
15 needed and some repositioning. Of course, one of the  
16 problems with apprenticeship programs in the United States,  
17 one of the reasons the private sector doesn't, frankly  
18 speaking, love them is they are afraid that if once you  
19 train a worker, that worker leaves and goes to work for a  
20 competitor.

21 But if the goal is to strengthen the defense  
22 industrial base and if people are sticking, because we have  
23 all become less mobile, modern Americans are much less  
24 mobile than our predecessors, then if you are training  
25 people in a particular area to work on submarines, for

1 example, or to acquire welding skills and electrical skills  
2 that are relevant to the submarine business, and they leave  
3 to a related enterprise in that area, you have not weakened  
4 the defense industrial base.

5 You have actually strengthened and deepened its ties  
6 in that community. You have also, of course, got a reserve  
7 workforce that can be pulled in if you need to increase  
8 those activities. I think the -- for broader  
9 understanding, Rhode Island, Senator Reed, you got some  
10 terrific hub based developments.

11 But as we are seeing this all around the country and  
12 the CHIPS and Science Act, which was passed on a bipartisan  
13 basis, I think included affirmation of the importance of  
14 this as a general policy approach, but also something I  
15 would say that the DOD can take on board.

16 Including, however, in that approach, Senator Reed  
17 would be addressing one of the key points you made, which  
18 is labor force participation. So, it is not enough to have  
19 the opportunities, people have to want to come to work, and  
20 that is partly about compensation. It is partly about can  
21 they access childcare?

22 It is partly about how long does it take to commute to  
23 work. There is a package that should be looked at of this  
24 hub level, and I commend that to this committee into the  
25 DOD for further investigation, the way it overlays with

1 your existing activities and priorities around the country.

2 And the third issue is, I think, with stating out  
3 loud, which is China. And I think that that is on the back  
4 of all our minds, or maybe the front, Senator, when we  
5 think about the potential threats here.

6 And China is of course, not just threatening but  
7 actually investing very heavily in further research and  
8 development, trying to move innovation, trying to own the  
9 future of jobs across a lot of civilian, but also, I think,  
10 military activities. And the best way to respond to that  
11 would be three fold.

12 First of all, invest more in science for the United  
13 States. Secondly, figure out how to commercialize and  
14 bring more of those activities to market because if you  
15 have got a strong civilian economy supporting innovation,  
16 that is going to help you on the military side also. And  
17 obviously there is a huge amount of spillovers and  
18 interaction there. And again, I would recommend a hub  
19 based approach for that.

20 And the third approach, the third piece would be to  
21 develop a line of work for artificial intelligence that is  
22 pro-worker. What do I mean by pro-worker? I mean within  
23 the framework Mr. Taylor suggesting, AI is certainly  
24 arriving, but is this AI is going to displace manual  
25 workers and displace workers with less education, or does

1 it enhance their productivity and enhance their  
2 opportunities? I think it could actually go both ways.

3 There is a lot of opportunity, a lot of issues around  
4 health care, a lot of issues around education, a lot of  
5 issues around manufacturing that are not the top priority  
6 for AI oriented investments in innovation in the private  
7 sector. There more to more about social media and digital  
8 advertising, to be frank.

9 So, focusing on those activities, and I think both  
10 Senator Reed and Senator Wicker alluded to this, changing  
11 how we think about manual work and thinking -- changing the  
12 value we place on manual skills -- I think that is  
13 something we have lost in this country over the past 40 or  
14 so years. It is something we were very strong at during  
15 WWII.

16 That was the basis of being able to scale up that  
17 economy and move it towards wartime production. To the  
18 extent we have outsourced those jobs to other places and  
19 created fragile supply chains, we should look at AI as an  
20 opportunity to motivate people and to bring technology to  
21 bear that enhances the effectiveness of that part of the  
22 workforce. Thank you.

23 [The prepared statement of Dr. Johnson follows:]

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1 Chairman Reed: Thank you very much, Dr. Johnson. Dr.  
2 Lockwood, please.

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1           STATEMENT OF JULIE A. LOCKWOOD, DIRECTOR OF BUSINESS  
2 MODERNIZATION, INSTITUTE FOR DEFENSE ANALYSES

3           Dr. Lockwood: Chairman Reed, Ranking Member Wicker,  
4 and fellow distinguished members of the Senate Armed  
5 Services committee, good morning. I am honored to  
6 contribute to this timely discussion on trends impacting  
7 the nation's defense civilian workforce.

8           My perspectives are informed by my own research, that  
9 of fellow economists, and also the work of many talented  
10 researchers at the Institute for Defense Analyses and at  
11 other Federally funded research and development centers  
12 supporting the Department of Defense.

13           I should state that the views that I expressed today  
14 are mine, and not necessarily those of IDA, as a  
15 nonpartisan institution. To succeed, the Department of  
16 Defense and its partners in the defense industrial base  
17 must maintain skilled, capable, and adequately staffed  
18 workforces.

19           Today's labor market is characterized by the  
20 convergence of several important trends, some of which have  
21 been discussed today already, which together produce  
22 intense competition for talent. Increasing job market  
23 polarization driven by technological advances has left many  
24 missed skilled workers behind.

25           Young men's rates of college attendance, enrollment,

1 and completion are in decline. An aging workforce will  
2 bring waves of retirements to DOD, threatening continuity  
3 and also institutional memory. The gig economy, meanwhile,  
4 offers workers low commitment alternatives and a very  
5 flexible lifestyle, and remote work is here to stay in some  
6 form or other.

7 In addition, affordable housing shortages add to  
8 existing downward pressure on worker mobility, and rapid  
9 advances in AI and other technologies are accelerating  
10 competition for STEM graduates. One or two of these  
11 concurrent trends alone would be troubling, but taken  
12 together, I believe they represent a sea change.

13 At present, there is excess demand for labor in the  
14 United States, with 9.5 million open positions for only 6.5  
15 million workers. And that is assuming every worker is well  
16 suited to the open positions, which they are not. DOD and  
17 its industry partners are not currently well positioned to  
18 compete effectively for the high demand talent that our  
19 national security requires.

20 These trends impact each segment of the labor force  
21 that this committee seeks to address, wage grade workers in  
22 our shipyards and our arsenals, STEM professionals in our  
23 labs and in the acquisition workforce, and critical  
24 supervisors and middle managers on the DS schedule. A  
25 common set of prescriptions can improve the health of each.

1           To compete for the skilled workers that DOD and its  
2 partners in the industrial base need to accomplish their  
3 critical missions, the Department should act aggressively  
4 to hire faster, pay competitively, reward performance,  
5 manage underperformance, and set the conditions needed for  
6 managers to make effective workforce mix decisions.

7           Moreover, DOD has an excellent opportunity to engage  
8 with this missing middle of mid skilled workers, a labor  
9 segment traditionally heavily involved in national defense,  
10 by filling critical shortfalls with a combination of  
11 trained workers and enabling technologies -- some of the AI  
12 that my colleagues here I have spoken to already.

13           People need purpose and inspiration to get off the  
14 couch and back in the workforce. If you take away only one  
15 idea from my time with you today, please let that be that  
16 incentives matter. By incentives, I do not only mean the  
17 pay and benefits that employees might earn for an excellent  
18 performance.

19           I also mean the conditions under which DOD's many  
20 managers, workers, and researchers invest their personal  
21 effort and make day to day decisions that impact the  
22 Department's bottom line. I believe that DOD's dedicated  
23 workers generally want to make optimal choices but are  
24 often stymied in doing so.

25           You can set the conditions to align incentives within



1 these decision environments, to make it easier for everyone  
2 to choose the sensible thing for the mission and for the  
3 taxpayer in their daily work, whether that is shaping DOD's  
4 workforce mix or when managing their teams. Incentive  
5 alignment will produce more effective decisions and free  
6 resources for other mission critical areas.

7 I personally think we could use a few more submarines.  
8 Decisive action can help achieve this incentive alignment  
9 and will reinvigorate DOD's civilian workforce by clearly  
10 signaling that the Department values its wage grade,  
11 professional, and defense industry personnel. That it will  
12 recognize and reward their contributions.

13 These innovations will allow DOD to advance as a high  
14 performing organization. Thank you for your time and I  
15 look forward to your questions.

16 [The prepared statement of Dr. Lockwood follows:]

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1 Chairman Reed: Well, thank you all for excellent  
2 testimony. Really superb. And this is, I think, a  
3 beginning of a dialog, not a one stop and move on. And I  
4 like submarines, but I share that with Senator Wicker, and  
5 he --

6 Senator Wicker: Here, here. The only thing I take  
7 issue with is she said a few. It would be, you know, quite  
8 a lot more submarine.

9 Chairman Reed: I agree. The only condition he puts  
10 on and they all have to be named after a city in  
11 Mississippi, but that is a small point. One of the issues  
12 that I see as I try to deal with these issues is that we  
13 have a problem of bringing in new workers. We also have a  
14 problem at the supervisory level.

15 Discussions with people in the industry say that is  
16 probably one of the key things that is slowing them down.  
17 They can get by with younger workers, but without the  
18 supervisors, they can't leverage those workers. So, Mr.  
19 Taylor, and Dr. Johnson, and Dr. Lockwood, your comments.

20 Mr. Taylor: Well, indeed -- I alluded to that. Thank  
21 you, chairman Reed. We know that, and even in industries  
22 like the Tech Valley and Silicon Valley, the tech  
23 industries, we can get them employees to come in.

24 The difficulty is keeping those employees. And  
25 increasingly, the new difficulty is keeping people in

1 middle management, in part because we have naively assumed  
2 that because one is a great mechanic, that one will be a  
3 great manager of mechanics.

4 And so, we take that person. We don't invest in  
5 teaching them how to be a great people manager. They hate  
6 the job and the employees that work for them hate the job,  
7 and therefore no one wins, and that has led to the  
8 retention problem.

9 So, one of the areas that we strongly recommend the  
10 Department of Defense consider doing is investing in people  
11 management. How do you -- it is not enough for someone to  
12 have the technical -- the underlying technical skills.

13 We have got to teach them, you know, technically to do  
14 the job, but teach them how to manage people. Because  
15 listen, at the end of the day, we have all talked about  
16 compensation, and compensation does matter, but all of the  
17 data tells us that people will leave an employer if the  
18 only thing they are doing is making a lot of money but  
19 being mistreated, and they don't find that this is a good  
20 work environment.

21 So, people management work is a lot of the work that  
22 the Department of Defense should consider investing in.

23 Chairman Reed: Thank you. Dr. Johnson, your comment.

24 Dr. Johnson: So, Senator, here is the good news, bad  
25 news aspect of artificial intelligence, you know, in answer

1 to your question.

2 The good news is there is definitely potential, and we  
3 can see it already in some parts of the private sector to  
4 develop tools that will enhance the ability of supervisors  
5 to manage more effectively and perhaps make it more easy to  
6 transition to become a supervisor.

7 So, I don't think there is enough effort going into  
8 that. I think it would be something very good for the DOD  
9 to focus on also. But I think that the bad news part is  
10 there is also a tendency, and not I am sure, in this room,  
11 but elsewhere, to think about algorithms as replacing  
12 people and doing the work.

13 We can rely on them, and we can close our eyes and the  
14 car will drive itself. That is a bad mistake. But what we  
15 are looking at, as Taylor said, is different ways for  
16 people to interact with machines at the supervisory level.

17 But I would emphasize making those manual jobs more  
18 attractive, more interesting, pulling younger people in  
19 with an AI element, not thinking about replacing people  
20 because that would be a mistake.

21 Chairman Reed: Dr. Lockwood, please.

22 Dr. Lockwood: Yes. I will just build on both of  
23 these gentleman's remarks by noting I wholeheartedly  
24 support Mr. Taylor's cry for additional training. I will  
25 note that among our defense workforce, that our uniformed

1 personnel are frequently sent to special schools to learn  
2 managerial and leadership skills.

3         However, very little investment is made in our  
4 civilian managers, and this is a critical gap that you can  
5 fill. I will note that some important changes have been  
6 made, some progress has been made in the area of leadership  
7 training, for the acquisition workforce in particular.

8         But leadership is different than management, so this  
9 is a key opportunity for the Department. Thank you.

10         Chairman Reed: Thank you very much. In terms of  
11 addressing our problems, one suggestion that I think  
12 everyone made directly or indirectly is we have got this  
13 pool of workers, military personnel that we can transition.  
14 And just very quickly because my time is expiring -- Mr.  
15 Taylor, how do we encourage our military personnel who are  
16 leaving the service to go into industries related?

17         Mr. Taylor: Yes, we know that there currently exist  
18 transition programs, but we have got to double down on  
19 those.

20         If we know that an individual is within 6 months to 12  
21 months away from either retiring or completing their  
22 military service, we have got to give them the skills to  
23 make sure that they can translate that either to role in  
24 the DIB, maybe not necessarily in the military, or within  
25 the private sector.

1           So, training them on how to become recruitable in the  
2 private sector would be the way to do it.

3           Chairman Reed: Thank you. My time has expired, and  
4 there is one other question I want to -- or comment I want  
5 to put on the table. One is, Dr. Lockwood focused on the  
6 acquisition forces in DOD and management training.

7           One of the areas I think, too, is in the civilian  
8 companies, the contractors. My sense is they don't do that  
9 very well. Dr. Lockwood or Dr. Johnson.

10          Dr. Lockwood: I would respectfully take a question on  
11 the management within our contractual partners for the  
12 record.

13          Chairman Reed: Very good. Thank you. Dr. Johnson.

14          Dr. Johnson: I think you are pressing on exactly the  
15 right issue here, Senator Reed. I think that we are under  
16 investing in managerial capabilities across a large part of  
17 our economy.

18          And of course, there is a big sucking sound as talent  
19 gets pulled towards the Silicon Valley type of sector, and  
20 the rest of the economy is neglected and underinvested in  
21 by itself, which is very counterproductive from an economic  
22 point of view and from a national security point of view.

23          So, I think you are -- absolutely top priority in line  
24 with both -- with certainly what Mr. Taylor said. I am  
25 sure with what Ms. Lockwood will say later.

1 Chairman Reed: Last word very quickly, Mr. Taylor.

2 [No response.]

3 Chairman Reed: Thank you very much. Senator Wicker,  
4 please.

5 Senator Wicker: Thank you, Mr. Chairman. In a 2023  
6 Federal employee viewpoint survey, workers were asked  
7 whether they agree with this statement, in my work unit  
8 differences in performance are recognized in a meaningful  
9 way. Only 45 percent of respondents agreed with that.

10 The same survey asked this question -- asked if they  
11 agree with this statement, there are no poor performers in  
12 my work unit. Only 19 percent of employees said that. Dr.  
13 Lockwood, in your written statement, you say DOD needs to  
14 accelerate reprimand or separation in cases of  
15 underperformance that does not improve with reasonable  
16 training investment.

17 Tell us about that and what can Congress do.

18 Dr. Lockwood: Thank you for the question. I think  
19 the bottom line is that if high performers are compensated,  
20 promoted, and otherwise treated the same as mediocre  
21 performers, that those high performers will be discouraged  
22 and take their talent somewhere else.

23 So, I think we can pretty clearly say that that is  
24 suboptimal for the Department. I think there are a number  
25 of things the Department could do to enable managers. One

1 thing is perhaps to limit employment terms. So, one might  
2 imagine a new form of Federal employment, a limited term  
3 contract.

4 We see this in several other developed economies.  
5 This would kind of split the difference, perhaps, between  
6 the use of a very flexible contracted solution through one  
7 of our industrial base partners or a typical Federal  
8 contractor, and what we understand now as Federal  
9 employment to give both the Department and the worker added  
10 flexibility.

11 Senator Wicker: Okay. That -- so I asked what  
12 Congress could do and do you think it would take statutory  
13 changes to implement something like that?

14 Dr. Lockwood: I do. In particular, because  
15 oftentimes both civilian and uniformed managers have  
16 concern of reprisal or other forms of unfortunate action  
17 should they do the hard work of trying to separate a  
18 nonproductive member of the staff. So, Congress clearly  
19 signaling that this is your intent and desired outcome, I  
20 believe would be helpful to the Department.

21 Senator Wicker: Let me ask all of you about the  
22 Federal wage system. It has not been reformed since 72.  
23 It is going to be a long time. It has weaknesses, such as  
24 the system in determining the wage is hyper local. It is  
25 incredibly bureaucratic and complicated. And by law,



1 public unions, public employee unions are heavily involved.

2 Dr. Lockwood let's start with you. In my opening  
3 statement, I mentioned welders and electricians. The  
4 Navy's public shipyards are struggling to hire and retain  
5 these critical workers. Does the FWS have something to do  
6 with this, and what can Congress do to help?

7 Dr. Lockwood: I believe it does. So currently, wages  
8 are set in pretty hidebound grades where we are taking a  
9 number of perhaps currently unrelated occupations, binding  
10 them together, and setting wages within a few steps for  
11 that grade.

12 Those grades were established back in the 70s based on  
13 the prevailing wages at that time, and currently bend  
14 together occupations that don't resemble one another at  
15 all. I believe a far more effective approach would be to  
16 compensate on the occupational level, both with a view  
17 toward the local wage, but also understanding that should  
18 we need to draw workers into a labor market that is  
19 relatively undersupplied, it will take a higher wage to do  
20 so.

21 We need to set wages cognizant of not only occupation  
22 locally, but also nationally.

23 Senator Wicker: We are -- it seems to me we are just  
24 going to basically have to give the Department flexibility  
25 beyond specific instructions.

1 Dr. Lockwood: I believe that is the case.

2 Senator Wicker: Dr. Johnson and Mr. Taylor.

3 Dr. Johnson: I would just add, Senator, there is a  
4 very big issue coming to you soon with regard to workplace  
5 surveillance, because the tools for surveilling workers are  
6 already greatly enhanced.

7 And in that conversation, there will be, and I think  
8 this is something that OSHA will be looking to Congress for  
9 guidance on -- I think you have to consider, to what extent  
10 that surveillance makes workers safer, more productive, and  
11 lines up with reasonable incentive systems, as Dr. Lockwood  
12 was saying, and to what extent it becomes oppressive and  
13 discourages workers from coming in to work for the defense  
14 industrial base. This is going to be a very hot issue very  
15 quickly.

16 And including that, Senator Wicker, in a discussion of  
17 the Federal wage system, could be quite a good idea. I  
18 would also emphasize the need for more housing. So, one  
19 reason wages have to be higher in some areas is because the  
20 community decided not to build housing. Now, that is the  
21 decision of the community.

22 It is not usually up to Congress, but I think deciding  
23 to spend your submarine dollars in places where housing is  
24 affordable suggests to me you will be able to build more  
25 submarines for the same wage bill.

1           Mr. Taylor: I would add, from the private sector  
2 side, we use the term pay for performance. And if Congress  
3 can do anything to give the flexibility to the Government  
4 worker, the Department of Defense, you could actually help  
5 there.

6           Ultimately people -- that doesn't surprise me, that 19  
7 percent, say only 19 percent think they have no poor  
8 performers. The Government has for quite a while recruited  
9 people, and what part of the sell has been job security.  
10 Well, that is the downside. If you know that you have job  
11 security, then there is no incentive necessarily to do  
12 anything to not have your job.

13           But more importantly, why would you differentiate if  
14 there is no pay for performance? If I am going to make,  
15 give or take 1 percent more than the colleague who does  
16 barely enough to get past, then there is no incentive for  
17 people to work harder and for you to attract the best  
18 talent.

19           Senator Wicker: Thank you sir.

20           Chairman Reed: Thank you very much. Senator Kaine,  
21 please.

22           Senator Kaine: Thank you, Mr. Chair. And thanks to  
23 our witnesses. A couple of topics I want to get into.  
24 First, Mr. Taylor, I appreciate that the Society for Human  
25 Resource Managers has supported a bill that I have been

1 promoting for many years. I talk about it a lot in the  
2 HELP committee, and they are tired of me talking about it,  
3 but I don't talk about it a lot at Armed Services, the Jobs  
4 act.

5 We do not allow Pell Grants to be used for high  
6 quality career and technical education. It has got to be a  
7 college. And an awful lot of really high quality job  
8 training programs are not college semester in length.  
9 Instead of a 15 week course that you meet three times a  
10 week for an hour and a half, a lot of high quality job  
11 training is an eight week course where you are five days a  
12 week, eight hours a day, many more classroom hours than a  
13 semester.

14 We allow Pell Grants to be used for full time  
15 students, for part time students, for people who are  
16 incarcerated, if they are getting college credits that they  
17 can use to get employed when they are back in society, but  
18 we have never allowed Pell Grants to be used for high  
19 quality career in tech.

20 I think if we could pass the Jobs Act, and it is  
21 wildly bipartisan. I think I have got about 65 of my  
22 colleagues who are sponsoring it, particularly at a moment  
23 when we have just done a big infrastructure bill. Who is  
24 going to build it? We have just done a big manufacturing  
25 bill and who is going to make it?

1           We have just made a commitment to build subs with the  
2           Australians, but both the U.S. and Australia have some  
3           similar workforce challenges. So, I very much appreciate  
4           SHRM supporting the Jobs Act, and I would look forward to  
5           working with my colleagues to figure out some way to  
6           finally get movement on it at a time when the unemployment  
7           rate is low. To another topic that I would like to ask  
8           your opinion on.

9           There is a wonderful program that I have been involved  
10          with called the Accelerated Training for Defense  
11          Manufacturing Program that is done in Danville, Virginia,  
12          at the Institute for Advanced Learning and Research, and  
13          its investment to build the submarine industrial base.

14          And in that program, we bring people from all over the  
15          United States who are working with suppliers in the  
16          industrial base -- some of the main shipyards, but also  
17          some suppliers. They train side by side.

18          There is Aussies there now. Part of the AUKUS  
19          arrangement. But also, I noticed the last time I went,  
20          there is a lot of Afghans, Afghans who served patriotically  
21          with the United States in Afghanistan. They moved to  
22          United States, and they are like, I will be a shipbuilder.  
23          Strikes me that one of the answers to this issue on  
24          workforce shortages is immigration.

25          An immigration reform system that prioritizes

1 workforce is something that is really important.  
2 Oftentimes when we talk about immigration here, it is all  
3 about the border. And we ought to talk about the border,  
4 but we also need to talk about the workforce.

5 An unemployment rate that is as low as ours right now  
6 -- there is not going to be a solution to some of these  
7 problems that does not involve a work based immigration  
8 reform, and I was hoping that you might just each offer  
9 your perspectives on that.

10 Mr. Taylor: Senator Kaine, you mentioned something  
11 that is at the core of most of the conversations in human  
12 resource circles. The fact of the matter is that Americans  
13 have been having fewer and fewer children over the last two  
14 decades. So, we have a birthrate problem. We have a  
15 replenishment problem.

16 And so, we at SHRM are very careful not to get into  
17 the political issues of immigration other than to say we  
18 need these 8, or 9, or 10 million jobs to be filled. And  
19 it would -- it is just nonsensical that we would in many  
20 instances have people who we have allowed to come to the  
21 U.S., we have educated them in our schools, and then we  
22 send them back when we have open jobs for them to fill.

23 So, again, staying away from the political parts of  
24 it, the reality is employers are saying we need this  
25 talent. This is -- we don't have the luxury of saying,

1 great, we are going to have a bias against people who are  
2 not born and trained here in the U.S.. In fact, we need  
3 all the talent. So, SHRM is quite supportive of this  
4 immigration. Now, how we get to that is a different issue.

5 We need to ensure that we protect our border and our  
6 homeland, and we need to know who is in our country, is our  
7 opinion. At that point, getting them to the talent,  
8 matching them up with organizations is something that we  
9 all are pushing for and frankly demanding at this point,  
10 with 3.7 percent unemployment.

11 Senator Kaine: Dr. Johnson and Lockwood.

12 Dr. Johnson: So, Senator Kaine, I see your two  
13 proposals as very tightly connected. My understanding is  
14 that the current Pell Grant system had its origins in the  
15 1958 National Defense Education Act, which is itself a  
16 response to Sputnik and a realization by Congress that we  
17 needed more engineers and scientists.

18 So, there is a big push at the higher end of education  
19 for math and science, but not so much for this -- in this  
20 middle -- the middle skill area that we are talking about.  
21 So that is a gap we have had for a long time.

22 And I think your idea is absolutely brilliant and spot  
23 on. But then when it comes to immigration, I think the  
24 question is, are we providing sufficient opportunities to  
25 all the people born in the United States, including in that

1 middle area? And if we are and they are not taking them,  
2 or if we still have gaps, then I think the case for  
3 immigration on a work based or skills basis, immigration  
4 reform is very compelling.

5 MIT -- I am an immigrant, Senator, as you may have  
6 guessed, and I went to -- I got a Ph.D. from MIT, and there  
7 is many other people in MIT currently who would love to  
8 spend their careers building the economy and strengthen the  
9 national security of the United States.

10 And many of them will be able to come in because we  
11 have not easy, but various points of entry, if you have a  
12 master's degree or higher, into the United States. But we  
13 don't do that for skilled labor, because in part of the  
14 insecurity and concerns about opportunities for native born  
15 Americans in that part of labor force.

16 But I think both your ideas together, Senator, I would  
17 make a package, because I think that is a compelling  
18 -- joint in two fold attack on the same problem.

19 Senator Kaine: Thank you. Dr. Lockwood, I am over  
20 time, but you could be as succinct as Mr. Taylor was  
21 earlier when he closed over time.

22 Dr. Lockwood: Yes. We absolutely need to invest in  
23 skills based education and we need to stop enshrining the  
24 four year degree as the only valuable and worthwhile thing  
25 that a young person can do. We have overinvested in



1 bachelor's degree education and underinvested in core  
2 skills training.

3 So that is something Congress can do now. I will just  
4 also note that our immigrant base is wildly productive in  
5 terms of new business starts and general entrepreneurship,  
6 and skills based immigration is definitely something that  
7 has been an incredible net benefit to the American economy  
8 and it ought to continue.

9 Senator Kaine: Thank you, Mr. Chair.

10 Chairman Reed: Thank you, Senator Kaine. Senator  
11 Tuberville, please.

12 Senator Tuberville: Thank you, Mr. Chairman. I would  
13 also like to add on to Senator Kaine's thoughts on, you  
14 know, Pell grants, Government grants, loans. I spent 40  
15 years in the education business. It is out of control.

16 We need to use it for the right reasons. It needs to  
17 be redrawn. I have seen people take Pell Grants, go buy  
18 cars with them, drop out of school immediately after they  
19 get Pell Grants. I have seen the same thing with loans.

20 There is not enough oversight on it, but we need to  
21 put more emphasis on what we are doing, and what he's  
22 calling the Jobs Act, and we can get more out of it if we  
23 would just concentrate on it and put some authority behind  
24 it, and let people know that you have got to do it the  
25 right way.

1           And I am all for jobs training because I have seen a  
2 lot of these kids that go to four year universities and  
3 waste their time and get degrees, and they can't get jobs  
4 when they get out. Their job has got to be at Walmart or  
5 somewhere else like that.

6           And it is not that Walmart's a bad job, it just if you  
7 spend four years of your money or the Government's money in  
8 going to school, you need to have some kind of opportunity  
9 to achieve something more successful.

10          You know, I come from Alabama, and we have an  
11 industrial base of about \$50 billion annually, 300,000 jobs  
12 that work in our military industrial base. We have Alabama  
13 Shipyard and Austal USA. We build ships, submarines, you  
14 name it. It is an amazing place. I enjoy going into these  
15 buildings and watching these people work.

16          What is amazing to me, the stories I get are from some  
17 of these major corporations, is they take their own  
18 initiative. They are going to fast food places and  
19 recruiting, and watching people work. And one shipbuilder  
20 told me that their best welders have come from fast food  
21 joints because they are willing to work. Dr. Lockwood, be  
22 careful, you are telling people, get up off the couch and  
23 go to work.

24          You don't need to say that around here. But they do,  
25 we have got to get people back to work. So, Dr. Johnson,

1 you brought up a few minutes ago that we have -- our  
2 workforce has dropped since WWII. Well, we all know that.

3 You know, I mean, that is the problem. What is the  
4 cause and what is the solution to that? I mean, we got to  
5 have -- what is the cause for -- we all know we have to  
6 have the cause of that since WWII and the solution. Is it  
7 NAFTA, that we send our manufacturing overseas? Because  
8 China has five to one manufacturing plants compared to us  
9 here in the United States. Is that part of it?

10 Dr. Johnson: Well, Senator, when I think of Alabama,  
11 I think of Huntsville and the remarkable success there, the  
12 rocket program, which was basically built from scratch in a  
13 place that had tremendous, no doubt potential, but had not  
14 previously established itself in that area of technology.

15 And we used to do that a lot, Senator. That was a big  
16 lesson out of WWII. We used to do it all around the  
17 country, and the private sector did it as well as the  
18 public sector. But unfortunately, what has happened due to  
19 market forces, and so I am not blaming any single  
20 individual, is we have shifted much more of that innovative  
21 activity towards the East Coast and the West Coast.

22 These are cities that don't like to build more housing  
23 prices. Housing is very high. It is hard to move there.  
24 A lot of the expertise in the middle, the middle skills  
25 part of manufacturing, for example, in the Midwest of the

1 United States, is stranded there because the opportunity is  
2 in other places, but they can't afford to move because of  
3 the housing market, and we are not making a best use of our  
4 talent.

5 So, I think more investments in more communities,  
6 including Alabama, which is features very highly in our  
7 book, by the way, that is the right geographic approach in  
8 general to bolstering science and technology. And when it  
9 comes to national defense, Senator, I think it lines up  
10 even better because you want build -- we want to build  
11 communities with these skills. People don't move that  
12 much.

13 Great, so their skills will stay in this community  
14 that is focused on producing submarines or rockets or  
15 whatever that community is. That that is going to be a  
16 very strong local regional defense base. So, we will use a  
17 little bit of our disadvantages in our favor in this case,  
18 and I think we will get a better economy and more national  
19 security as a result.

20 Senator Tuberville: And I think still in our country,  
21 we still have a lot of patriotism out there. Sometimes we  
22 don't see that, but people want to work for our military  
23 industry. And they make very good money, I mean, but you  
24 got to pay a price.

25 You got to sacrifice. And we can't overlook our

1 education in this country. Our education is going south.  
2 Take it from somebody who has been in high schools all over  
3 this country as my former job. The things that we are  
4 teaching are not conducive to push these young men and  
5 women in making better for themselves.

6 I mean, they just say, if I get a degree or if I get a  
7 diploma in high school, that is good enough, and that is  
8 really not good enough. They have got to be incentivized  
9 in how to do it. And Mr. Taylor was talking earlier about  
10 that. You know, we have got the incentivize. But again,  
11 it all goes back to our military industry.

12 As you said, Huntsville. It is growing. I just  
13 bought a new house up there and watched it go up, okay.  
14 There wasn't -- in the entire time that that house was  
15 built, there wasn't one white American, one black American,  
16 or one Asian American that worked on that house. It was  
17 people from other countries, okay.

18 I don't know whether they were legal or not. They  
19 said they were. And I asked them, I said, make sure there  
20 is not -- I happen to be a Senator. Make sure there is  
21 people that are Americans that are working on this house.

22 But we can't build anything, we can't build anything  
23 unless we have immigration in this country. I truly  
24 believe that. I truly believe that. But we got to do it  
25 the right way. Thank you very much. Thank you, Mr.

1 Chairman.

2 Chairman Reed: Thank you, Senator Tuberville.

3 Senator Rosen, please.

4 Senator Rosen: Well, thank you, Chairman Reed, for  
5 holding this hearing. I would also like to thank each of  
6 the witnesses, of course, for testifying today.

7 And I worked in my former career in STEM and so I am  
8 going to talk a little bit about the STEM workforce  
9 shortage. And as mentioned in the National Defense  
10 Industrial Strategy, we have to find creative solutions to  
11 upskill our manufacturing workforce so that we can meet our  
12 nation's strategic production targets and our goals.

13 And so, Mr. Taylor, can you speak to the labor  
14 shortages in STEM fields, the impact on our defense  
15 industrial base, and if there are specific sectors impacted  
16 by the skilled workforce shortage more than others?

17 Mr. Taylor: Right. As you can imagine -- thank you,  
18 Senator Rosen. You know, one of the problems is we wait  
19 too long to talk about what the talent problem is.

20 We say -- we look to employers and say, you have not  
21 hired enough engineers this year, for example. The reality  
22 is this is a PK through 12 problem, and we are not looking  
23 at it -- we want to solve for it immediately. We have a  
24 pipelining problem from the diversity, for example, of the  
25 types of Americans who come through the systems K through

1 12 educations, we know disproportionately underperform in  
2 communities --underrepresented minorities.

3 And then you wake up and say, well, we don't have  
4 enough diverse talent in STEM. Well, it is because that  
5 started 13, 14 years ago. It didn't start immediately.  
6 And so, employers are committed to the idea of increasing  
7 and solving for their STEM worker talent shortages, but we  
8 know when we say at SHRM, it is the two Es. It is  
9 education and employers.

10 We have got to start a lot earlier in the process.  
11 The other thing that the Senator just spoke to is that  
12 increasingly companies are going straight to high schools  
13 and saying -- in fact, some new instances of going to  
14 middle schools and saying, I am going to identify your kids  
15 now and ensure that they are obtaining the skills that we  
16 need to -- the STEM skills, you know, the basic math, the  
17 sciences, etcetera, and we essentially are going to pull  
18 them through and mentor them so that we have potentially  
19 employable people 10, 12 years later, as opposed to hoping  
20 that the K through 12 system will provide the pipeline.

21 Senator Rosen: I am glad you brought that up because  
22 my very first bill is called Building Blocks of STEM, and  
23 it does exactly that and allows to build that STEM  
24 pipeline, K through 12 schools all across America to invest  
25 in STEM education.

1           And I have seen the greatest programs in kindergarten  
2 and elementary school, how they kind of use little robotics  
3 and fun things that kids don't even realize they are  
4 learning STEM, but they are learning all of these great  
5 things of logic. So, thank you for bringing that up and I  
6 was glad to have a bill pass to do that.

7           I am going to move on to Dr. Johnson. As DOD, we are  
8 going to focus on partnering with the private sector. We  
9 know that is really important to increase our workforce  
10 preparedness. How can the Department expand its outreach  
11 to encourage more of the private sector in the advanced  
12 manufacturing process?

13           Dr. Johnson: I think that is a great question,  
14 Senator. And I think focusing on hubs' areas, geographies  
15 where the private sector has the potential, where you can  
16 -- you have the labor force, you have the potential labor  
17 force, including with your admirable STEM initiative.

18           And thinking about where housing can also be built,  
19 Senator Rosen. I think too often there is great  
20 opportunities in places where the communities don't want to  
21 build housing, so the housing just becomes super expensive.

22           Then you have to pay a very high wage, or nobody is  
23 going to move there. So, I think looking for those  
24 geographic partnerships is something that has not  
25 previously been sufficiently emphasized, Senator.



1           Senator Rosen: Well, this isn't for defense, but we  
2 are becoming a new tech hub in Reno, and this is the kind  
3 of thing that we are talking about happening in Nevada.  
4 But I am going to move on to Dr. Lockwood quickly because I  
5 want to talk about the impact of budget delays.

6           I know the impact of failure to pass a full year  
7 funding deal, including for the DOD, it constrains are long  
8 term strategic plans. It has negative impacts for all of  
9 our prime contractors, for our subcontractors. They can't  
10 prepare and plan. And when you can't plan, you can't have  
11 the workforce.

12           And if you lose the talent workforce and they go  
13 somewhere else for a job, they may not come back, and it  
14 takes a long time to build a qualified welder for a  
15 submarine and all of those kinds of things.

16           So, if we are going to build those resilient supply  
17 chains for our defense industrial base, Congress must pass  
18 regular appropriations in a timely manner. So, Dr.  
19 Lockwood, can you talk to us about the Federal -- the  
20 impact of the Federal funding, the uncertainty all across  
21 our defense industrial base, what that really means for our  
22 safety and security across the world?

23           Dr. Lockwood: Absolutely. I do view uncertainty in  
24 the timing of Federal budgets to have a very negative  
25 impact on our total readiness posture.

1           In addition, I would say that further dampens interest  
2 in Federal employment by creating the perception of turmoil  
3 or an unnecessary politicization of these critical roles  
4 that we need filled.

5           I will also add that particularly for young people who  
6 are just entering their careers, extremely long delays in  
7 time to hire often become untenable. They have loans  
8 looming. They need to start work immediately.

9           They can't afford to wait 6, 12 months to be certain  
10 of having a job. So, this is something that we can  
11 address. Thank you.

12           Senator Rosen: Thank you, Mr. Chairman. I yield  
13 back.

14           Chairman Reed: Thank you very much, Senator Rosen.  
15 Senator Sullivan, please.

16           Senator Sullivan: Thank you, Mr. Chairman, and I  
17 appreciate the witnesses today on a really, really  
18 important topic.

19           By the way, I agree 100 percent with Senator Kaine on  
20 his Jobs Act. I think it is something -- and Senator  
21 Tuberville, on what we need to do, but I think it is a  
22 really good opportunity and we should keep moving forward  
23 on that.

24           As you know, when we are looking at our strategic  
25 competition, one of the things that the dictators in

1 Beijing, Xi Jinping and others, are really scared about is  
2 our submarine force. It is an asymmetric advantage that is  
3 still very significant, and they are terrified by it, which  
4 is why we should be building a lot more submarines.

5 I met with the CNO of the Navy yesterday and just  
6 talked about how there is so much bipartisan interest here  
7 in the Congress to increase our capacity to build ships and  
8 subs. My staff have done some research for me.

9 We have the capacity. We have done it before. A lot  
10 of people don't know, our country had a two year head start  
11 before Pearl Harbor on increasing our ship capacity. So,  
12 in 1937, we had 335 ships in our fleet.

13 By Pearl Harbor, December 7th, 1941, we had 790, okay.  
14 So, we doubled the size of the fleet before we got into a  
15 war. And it is a dangerous time right now. Very analogous  
16 to the 1930s, in my view, and a lot of what happened was  
17 Congress acted. Four laws in particular, the Vision  
18 Trammel Act, the Second Vision Trammel Act, the Naval  
19 Expansion Act of 1940, and the Two Ocean Navy Act of 1940.

20 So, I want to start with you, Dr. Lockwood. What are  
21 the big ideas, big ideas -- we have done this before,  
22 right. We don't want to start building our industrial base  
23 out once the bullets start flying. The time to do it is  
24 now. And we have done this before. We have the capacity  
25 to do it as a nation before.

1           What are the big ideas that you think we need,  
2 particularly as it relates to subs. The estimates are we  
3 need over 100,000 new trained workers. But I think the  
4 bipartisan nature of what is needed -- we would be open to  
5 anything, even a new shipyard. What are the big ideas? I  
6 want to hear from you very briefly, and then the others, if  
7 you can actually respond in a request for the record.

8           And then, Dr. Johnson, I have a quick question for you  
9 on what is happening in Silicon Valley. But Dr. Lockwood,  
10 the biggest thought pieces you can do here, quickly.

11          Dr. Lockwood: Thank you. Let me quickly say that the  
12 submarine force is near and dear to my heart, as the wife  
13 of a current serving commander of a fast attack boat for  
14 -- deployed in Guam, the USS Asheville.

15          Senator Sullivan: Well, Xi Jinping is scared to death  
16 of what your husband has --

17          Dr. Lockwood: Indeed. I believe that to be a true  
18 fact, sir.

19          Senator Sullivan: We need a lot more of them.

20          Dr. Lockwood: Yes. I do believe -- the analysis I  
21 have seen has indicated there is simply no way that this  
22 country can meet its own needs and also support its AUKUS  
23 commitments without an additional shipyard.

24          Senator Sullivan: So, you agree with the idea of an  
25 additional shipyard?

1 Dr. Lockwood: I do.

2 Senator Sullivan: A public shipyard?

3 Dr. Lockwood: I think we need all available options,  
4 sir.

5 Senator Sullivan: Okay.

6 Dr. Lockwood: I would be open to performing  
7 additional analysis to try and determine exactly what  
8 format would be most effective, but I will note that in  
9 WWII, tanks rolled off the floor of the Ford plant. And  
10 they are damn proud of it, and they should be.

11 Senator Sullivan: Good. Well, if you can get back to  
12 us with more details on that idea and other big think ideas  
13 on this. The way the Congress acted prior to WWII, very  
14 impressive. Dr. Johnson, real quick, I agree with Senator  
15 Tuberville that there is still very much patriotism in our  
16 country that wants to help.

17 One of the ironic areas that I have kept a close eye  
18 on over the last several years is the return of patriotism  
19 in Silicon Valley. Ten years ago, they didn't have it,  
20 right. You know, they were much more interested working  
21 with the goddamn Chinese communist than American military  
22 industrial capabilities.

23 That is changing. It is a great opportunity for us as  
24 a country. It is a strategic advantage the Chinese and  
25 Russians don't have. But the Pentagon's culture in rules

1 don't allow it -- don't allow us to take advantage of it.

2 You have heard this phrase, the valley of death, right.

3 You have a -- high tech companies got great capacity,  
4 can't break into the Pentagon system, and then the company  
5 goes out of business because it takes five years to get the  
6 Pentagon interested.

7 What is your thoughts on what we can do to enhance the  
8 ability of our industrial capacity to take advantage of  
9 this new interest with some of our high tech companies who  
10 want to help us, want to help America be strong, and not  
11 fund the Chinese, like so many of them used to do, which  
12 was very pathetic and un-American in my view.

13 Dr. Johnson: Yes, Senator. I think you are spot on  
14 with that overall characterization. I think you need some  
15 carrots. It could be prizes. It could be prestige.  
16 Things that pull those tech companies towards the problems  
17 that you want them to solve.

18 Because if you leave them to their own devices, we  
19 know what they are going to do. It is more social media,  
20 or it is more digital ads. I don't think that particularly  
21 helps national defense at all.

22 So, I think defining -- using DARPA type approach and  
23 defining, this is the problem to be solved, which could be  
24 a direct military problem, or it could be health care  
25 related to the military. It could be transitioning

1 military personnel to civilian. It could be education more  
2 broadly.

3 There is a lot of really important goals that matter a  
4 lot to you on this committee, and Silicon Valley pays zero,  
5 almost zero attention to them. I will also, by the way,  
6 Senator, send you some enhanced -- some reinforced  
7 -- reinforcement for your talking points on the role of  
8 submarines in WWII, the role of U.S. innovation on naval  
9 aircraft prior to WWII, which was actually huge.

10 And the fact that this country was producing roughly  
11 one aircraft carrier per month at its peak in WWII because  
12 we were able to move so much of our production when it was  
13 needed but not prematurely. So, you are right about the  
14 base that was built. Anyway, Senator, I will follow up  
15 with you directly on that.

16 Senator Sullivan: Thank you. Thank you, Mr.  
17 Chairman.

18 Chairman Reed: Thank you, Senator Sullivan. Senator  
19 Warren, please.

20 Senator Warren: Thank you, Mr. Chairman, and thank  
21 you for holding this hearing on workforce dynamics. You  
22 know, the strong economic recovery under President Biden is  
23 a win for the United States.

24 We have 14.8 million jobs created. Fastest growth in  
25 real inflation adjusted wages of any recovery in more than

1 half a century. But there is still work to do. We need to  
2 invest in our defense manufacturing workforce and make sure  
3 that we have the workers that are needed to meet our  
4 national security needs.

5 One tool that I would like us to talk about, for  
6 making sure that the labor supply keeps up with the labor  
7 demand, is providing the quality, affordable childcare that  
8 workers need so they can actually go to work. You know, we  
9 do this to some degree already, including with the DOD's  
10 excellent childcare program.

11 But while we could invest a whole lot more for our  
12 military and our civilian families, over half of Americans  
13 right now live in childcare deserts. That means children  
14 outnumber the childcare slots by three to one.

15 And that means millions of families across the country  
16 that need childcare and either can't find it, or if they  
17 can find it, they can't afford it. Professor Johnson, you  
18 are an economist at MIT, former Chief Economist at the IMF.

19 So, let's do some econ 101 and drill down on the root  
20 of this problem. How does insufficient supply of childcare  
21 affect labor supply, including the defense workforce?

22 Senator Warren: The lack of adequate childcare  
23 obviously limits the ability of women to participate in the  
24 workforce. And of course, many of those aircraft carriers  
25 and submarines that were built in WWII were built by women.



1           Senator Warren: Yes. So not enough childcare means  
2 not enough workers to power our economy in the defense  
3 industry and basically everywhere else. But let's go down  
4 one more level on this. Professor Johnson, help us  
5 understand the bottleneck in childcare. If we want to  
6 increase the supply of childcare, what is the key input  
7 that we need more of?

8           Dr. Johnson: You need more people willing to work in  
9 the childcare, private sector.

10          Senator Warren: Okay, so we need more childcare  
11 workers to help unlock this labor supply across the board.  
12 How can we do that? Why don't we just pay childcare  
13 workers more money?

14          Dr. Johnson: Well, that is the best idea. And that  
15 is what would work. But just emphasize, these childcare  
16 centers, for the most part, operate on razor thin margins.  
17 So, there's not much else to squeeze.

18          And the money that's paid by parents goes to the  
19 childcare workers. But the parents can't afford to pay the  
20 childcare workers enough to pull people into that childcare  
21 work. So, the market, I am afraid Senator Warren, is  
22 failing us here.

23          Senator Warren: Okay, so the market fails, but DOD  
24 has stepped up. DOD child development centers capped fees  
25 at 7 percent of family income.

1           And then the Federal Government picks up the rest of  
2 the cost. It is a worthwhile investment in military  
3 readiness. But DOD has not updated its pay scale for  
4 childcare workers for 30 years now. And unsurprisingly,  
5 DOD is struggling to attract the workers it needs.  
6 Meanwhile, Federal investments in civilian childcare fell  
7 off a cliff last year when the pandemic funding ended, and  
8 that exacerbated childcare shortages.

9           So, Professor Johnson, if the Federal Government  
10 stepped up its investments in childcare, particularly to  
11 increase childcare worker pay, what impact would that have  
12 on the defense workforce?

13           Dr. Johnson: I think it would strengthen the defense  
14 workforce. More women would be able to go to work. You  
15 would also have more opportunity for women to build the  
16 skills that we have all been talking about, emphasizing  
17 across all range of skills earlier in their careers.

18           So instead of having to take some years out of the  
19 labor force, they would continue to be engaged, and that is  
20 really important for having supervisory talent, for  
21 example, when you reach a certain age.

22           Senator Warren: And I take it, Mr. Taylor, do you  
23 agree with this?

24           Mr. Taylor: Not only do I agree, it is an issue that  
25 you are increasingly seeing on the private sector side.

1 Corporations are underwriting it, and we don't have a 50  
2 year old lag in terms of compensation. So many,  
3 increasingly organizations are building their own childcare  
4 facilities and fully subsidizing them to draw talent in and  
5 to retain that talent.

6 The other thing, though, Senator Warren that I think  
7 is really important is increasingly we speak about, and we  
8 are seeing this in all of our data, it is dependent care.  
9 So more than just childcare.

10 Many of us find ourselves in the middle of this  
11 sandwich generation, where you have to decide not to go  
12 take a job because no one is there to provide for your  
13 elderly parents or grandparents. So, we are seeing a big  
14 theme in all of our data that says not only childcare, but  
15 broadly dependent care.

16 Senator Warren: So, I think this is terrific. You  
17 know, I am all for building a strong defense manufacturing  
18 workforce, the topic we are here today to discuss.

19 But let's treat it like the supply chain issue that it  
20 is, and address root causes like underinvestment in  
21 childcare and dependent care, and childcare workers.

22 I am glad to be working with members of this committee  
23 to invest in the DOD's childcare program. I want to call  
24 out my partner in this, Senator Scott. We are working on  
25 this in our subcommittee, and we are going to keep fighting

1 for affordable childcare for our defense workforce and for  
2 all Americans. Thank you, Mr. Chairman.

3 Chairman Reed: Thank you, Senator Warren. Senator  
4 Scott, please.

5 Senator Scott: I want to thank Senator Warren. We  
6 have had a good subcommittee on Personnel, and we are we  
7 are having one this afternoon. It is going to talk about  
8 injuries from, I guess, more noise -- yes, it is going to  
9 be -- it will be interesting because we have got to deal  
10 with this. So here is what I don't understand.

11 Do you know how many full time jobs have been added in  
12 the country in the last nine months or last three months?  
13 Anybody know? We have lost 1.5 million. We are adding  
14 part time jobs. So, you are trying to figure out, why is  
15 this happening? When I was -- I became Governor at the end  
16 of a big downturn. I became Governor in January 2011, and  
17 I went to a National Guard.

18 They were coming back from overseas, and they had 30  
19 percent unemployment. And then I ran my whole campaign on  
20 getting people jobs. I said, I would get 700,000 jobs.  
21 And so, I tried to figure out how to get that done.

22 So, we just tried to figure out. I had to go recruit  
23 companies every day to try to get them to come to Florida,  
24 because people were moving out of Florida back in 2010 when  
25 I got elected. So, we did a variety of things. First off,

1 we -- as the Federal Government, we give a lot of money to  
2 our States to -- for workforce boards.

3 And you know how many people and they were filling  
4 jobs for? Nobody had any idea. There was no measurement.  
5 So, the first thing is we required them to give us a daily  
6 report. It was over -- I think it was over \$250 million a  
7 year that we were spending of Federal money. That is  
8 number one.

9 Number two is we -- I am a veteran, and I think it is  
10 ridiculous that people come back from overseas and don't  
11 have a job. I remember I was getting out of the -- I  
12 didn't go to Vietnam, but I served during Vietnam era, and  
13 when Vietnam ended, it was impossible to get a job in this  
14 country.

15 And so, all my friends here now couldn't find a job.  
16 So, we sort of -- we started getting monthly reports on  
17 that and it took about a year. We did a variety of  
18 programs.

19 We did a lot of workforce meetings and things like  
20 that. It took about a year, but actually our unemployment  
21 went -- was lower for our veterans than it was for  
22 nonveterans. It was way higher for veterans when I  
23 started. I think it was almost 15 percent or something  
24 like that when I started. Unemployment for the State was  
25 over 10.

1           Then what we started doing is we, when I became  
2 Governor, all they wanted to do is say, oh, if you don't go  
3 to college, you know, man, you know, you must not be very  
4 smart. You are not going to have any opportunity, which is  
5 complete BS.

6           Most of my family didn't go to college. I am the  
7 exception of my brothers and sisters, my nieces and  
8 nephews, and they are never unemployed. They always have a  
9 job. The other thing we did is we waved a whole bunch of  
10 things for veterans. So, there will be -- here is my first  
11 questions.

12           So, we have all these rules for schools, and we have  
13 State schools, we have for profits -- we have all this  
14 stuff. Should there be different standards for everybody?  
15 I mean, when you guys hire somebody, you say, man, I think  
16 they ought to be a different standard for how they get  
17 Federal money or Pell Grants or any of this stuff. Should  
18 there be? Should it be treated differently just because of  
19 their -- how they are organized?

20           Does anybody have a view on that? Because I mean, I  
21 could give you an example, if you are a university, you  
22 have no obligation to help people get a job. I changed the  
23 formula in Florida, and we became number one in higher  
24 education because I said, I remember I am a kid that had no  
25 money, went to school and did junior college that cost only

1 \$200 bucks a semester. University was expensive at \$255.

2 And they said, we are going to give our universities  
3 money based on three things, do you get a job? How much  
4 money you make? And what is the cost to get a degree? It  
5 is actually how people got degrees and we kept tuition low.  
6 So, by the time I left, we were number one in higher  
7 education.

8 Now, University of Florida, according to a lot of  
9 studies like Wall Street Journal, is the number one public  
10 university in the country because we paid for our result.  
11 So, what do you guys think about having the same standards  
12 for -- if we have standards for proprietary schools that  
13 they have to help people get a job or they don't get money.  
14 Same standards for all schools.

15 Dr. Johnson: So, Senator, I work for an engineering  
16 school that spends a lot of time trying to get its  
17 graduates jobs, and I fully agree that is a very important  
18 emphasis. I also point to Orlando. It is, to emphasize, I  
19 believe it is one of the leading examples of public private  
20 partnerships generating skills related to defense  
21 industrial base, and also generating huge amount of jobs.

22 Do I think that one size -- we should have one size  
23 fits all for even higher education, even the university  
24 sector? I think some diversity and competition is good. I  
25 think at MIT does very well in that competition. I think

1 encouraging others to do exactly what you are saying is a  
2 good idea. Would I require it? I think in this country,  
3 such requirements are hard to make work and often get a  
4 backlash.

5 But I think where you are pushing, Senator, that  
6 education of all kinds should be linked to finding jobs,  
7 and keeping people in jobs, and measuring outcomes and  
8 making that data available to everyone, I think that is  
9 tremendously important, Senator.

10 Senator Scott: Can I ask one question real quick?  
11 So, the other thing I did was if you came down, if you were  
12 Harris, and you were going to expand or let's say Northrop  
13 Grumman, they said they are going to add -- they were  
14 removing the stealth bomber, so I tried to get them to do  
15 more of in Florida.

16 So, they said we are going to need x number of jobs.  
17 So, we guaranteed -- I guaranteed, because I paid for it as  
18 State budget, I said, we are going to graduate these  
19 peoples with these degrees. And some of them were  
20 university, some more technical schools and stuff like  
21 that. So, do you think that that is what we ought to be  
22 doing with our education dollars?

23 Dr. Johnson: I think workforce planning, Senator, of  
24 exactly the kind you are talking about is very good. I  
25 think we you need to be careful about over subsidizing the



1 private sector with things they would otherwise have done.

2 But if it is a net increase to the defense industrial  
3 base and on a Federal, State partnership basis, I  
4 absolutely agree that making sure people have the skills  
5 and are incentivized to stay in Florida, which is also what  
6 obviously happened, I think that is really important for  
7 the development of the defense industrial base.

8 Senator Scott: Thanks.

9 Chairman Reed: Thank you, Senator Scott. Senator  
10 Hirono, please.

11 Senator Hirono: Thank you, Mr. Chairman. We know  
12 that there is a workforce shortage in just about every  
13 business, every industry, from restaurants to the defense  
14 industry -- this is where Mr. Taylor.

15 The DOD has established the Defense Civilian Training  
16 Corps to attract top talent into the defense ecosystem and  
17 specifically relating to acquisitions. So how is this  
18 Training Corp doing in terms of attracting the kind of  
19 people that the defense industry needs?

20 Mr. Taylor: Thank you for the question. I think Dr.  
21 Lockwood would be more familiar with that particular DTC  
22 program.

23 Dr. Lockwood: Thank you. I will note that there are  
24 actually currently several STEM employment, workforce  
25 coordination programs going on in the Department of

1 Defense, and certainly that one is among them.

2 I believe that these programs would be far more  
3 effective if there was a greater degree of coordination  
4 among them. For example, sharing of hiring objectives and  
5 even of candidates. Likewise, to the other Senator's point  
6 earlier, providing metrics for such programs would be very  
7 important.

8 Senator Hirono: Well, why isn't there coordination?  
9 Why aren't there metrics to measure the effectiveness of  
10 these programs? Whose responsibility is it to ensure those  
11 aspects are addressed?

12 Dr. Lockwood: Thank you for the question. As to the  
13 particular statutory authority, I will take that for the  
14 record. I will note that a mandate to coordinate among  
15 programs, to share best practices, to ensure that these  
16 programs are appropriately targeted to market and are  
17 adequately innovating would be very effective, and I  
18 believe that is something that the Congress, and the  
19 Senate in particular, can draw greater attention to.

20 Senator Hirono: Okay. You can help us, my staff to  
21 better focus on some of those kinds of changes that we need  
22 to change.

23 Mr. Taylor, I was particularly gratified that you  
24 mentioned that if we want people to have STEM experiences  
25 in education, that it is really something that we should

1 look at from pre-K to 12, and that, we also should pay  
2 attention to diversity. So, yes, Senator Rosen has a bill  
3 that would encourage, I think, more emphasis on these kinds  
4 of programs.

5 I have a bill that would focus on women and minorities  
6 in STEM education. What ideas do you have that would focus  
7 us on the need for paying attention to K-12 and onward if  
8 we want more people to -- being STEM educated?

9 Mr. Taylor: Thank you for that question. I had the  
10 good fortune of once running what was called the Thurgood  
11 Marshall College Fund, which represents the country's  
12 publicly supported historically black colleges and  
13 universities, 47 of them. In fact, Mr. Gates here was my  
14 colleague.

15 We specifically created a program where we went into  
16 three markets that were largely populated with historically  
17 underrepresented people. And we took kids who were between  
18 the ages of, and I want to get the numbers right, 9 and 13,  
19 with a specific focus on taking those kids in afterschool  
20 programs that were STEM oriented to expose those children  
21 and their families to STEM careers, but more importantly,  
22 the importance of taking certain types of curriculum early  
23 on so that by the time -- if you wanted to go to college to  
24 be an engineer, there are things you needed to do in high  
25 school, courses you had to take, etcetera.

1           So, we mapped them. We gave them -- oftentimes their  
2 families did not have -- they didn't have parents who were  
3 college graduates, or if they were college graduates, they  
4 weren't STEM college graduates.

5           We literally took those kids, and we followed them  
6 through 10th grade, preparing them up to and including  
7 taking the SAT, ACT, etcetera. So those sorts of programs  
8 helped us yield a significantly higher number of future  
9 STEM workers from those communities than we would have  
10 without them.

11          Senator Hirono: So, you are saying that we have to be  
12 very intentional about how we are going about it, and that  
13 you have some longitudinal data that shows that when you  
14 are this focus, that you will have people going into the  
15 STEM areas.

16          Because, for example, women and minority people drop  
17 out of the STEM pipeline at every step of the way because  
18 especially for women, for example, there are not very many  
19 models for women in STEM.

20          And in terms of workforce training, we are building a  
21 drydock, Pearl Harbor Shipyard. It is the biggest  
22 infrastructure project that the DOD is engaged in. It is  
23 \$3.5 billion. I hope that it will come in at that price.

24          But they had a hard time finding workers for this  
25 project. Some 2,000 plus workers will be needed to build

1 this drydock over the next two years or so. And in the  
2 meantime, we have an apprenticeship program for Pearl  
3 Harbor Naval Shipyard, one of four public shipyards that we  
4 have.

5 They had 2,500 applicants for 152 positions. So  
6 obviously, there are a lot of people who want to get this  
7 kind of training so they can be in the pipeline to work in  
8 our shipyards, but we are not creating enough spaces for  
9 them. Do any of you have any ideas of what we can do to  
10 accommodate these young people who want to be trained in  
11 our workforce? Anyone?

12 Dr. Lockwood: Yes. It has already been mentioned by  
13 a few of my colleagues here, but school to work training  
14 pipelines and close public, private partnerships with  
15 educational institutions are very effective at establishing  
16 firm pipelines for workers.

17 We have demonstrated this many times in the private  
18 sector, particularly in the auto industry, in some of the  
19 States represented here, reinforcing the training at  
20 community colleges and trade schools, and linking those  
21 skilled professions directly into where the jobs are  
22 needed.

23 Dr. Johnson: Senator, apprenticeships powered by AI,  
24 I think that is where the future is, and that is what the  
25 private sector is not going to do enough, without your

1 prompting.

2 Senator Hirono: Thank you, Mr. Chairman.

3 Chairman Reed: Thank you very much, Senate Hirono.  
4 Senator Mullin, please.

5 Senator Mullin: Thank you, Mr. Chairman, and thank  
6 you for the witnesses who are here. I just find it, the  
7 irony of us talking about what we need to do to get a  
8 workforce going and, you know, from a guy that is owned  
9 multiple trade companies -- I mean, we incentivize in  
10 Congress.

11 We incentivize people to stay home. They can work the  
12 system. I mean, here we are legalizing drugs, marijuana  
13 for medical purposes, and we are incentivizing kids to get  
14 a medical card to smoke marijuana in high school at 18  
15 years old, and they can't pass a drug test to get hired by  
16 DOD to begin with. I mean, we do it to ourselves here in  
17 Congress. If we want to really get our workforce going,  
18 then we need to incentivize people to work, not have an  
19 excuse to stay home.

20 And we have a program that gives people a helping  
21 hand, we won't give them a helping hand to push them into  
22 the workforce either. Like get a helping hand, stay on a  
23 platform, and then you disincentivize them to build a step  
24 up. I have had hundreds of employees that refused a raise  
25 over the years that I have been self-employed because they

1 can't afford to take the raise, because if they take this  
2 raise to \$18 an hour, they lose these benefits.

3 And if you can't take a raise \$18 an hour and do that  
4 job, you are never going to get the job that can do \$30 an  
5 hour because the ladder stops at that point. It is our  
6 fault. And so, if we in Congress want to get serious about  
7 the workforce, then we need to figure out how we  
8 incentivize people to get into the workforce.

9 That means we need to push them into the workforce,  
10 not become -- not allow them to become dependents of the  
11 State. And that is exactly what we have. We have three  
12 generations now of people that are dependent on the State.  
13 But that is me ranting. I will stop and I will move on to  
14 ask you my questions.

15 Dr. Lockwood, I would like to start with you. As the  
16 largest maintenance repair and overhaul facility in the  
17 world, which is at Tinker Air Force Base, we have a huge  
18 number of civilian employees, around 16,000.

19 Most of these employees are wage grade maintainers and  
20 many have decades of experience. We have received reports  
21 from -- or reports that the DLA, which is the Defense  
22 Logistics Agency, is increasingly relying on contractors to  
23 do these kinds of jobs at other sites. Are you familiar  
24 with this?

25 Dr. Lockwood: Yes.

1           Senator Mullin: Okay. With a follow up question on  
2 that, then, when using contractors instead of Government  
3 employees, what are the vetting requirements for bringing  
4 them in on our bases?

5           Dr. Lockwood: It is my understanding that like other  
6 workers on military facilities, that they must pass a  
7 background investigation.

8           Senator Mullin: Or are we concerned about moving that  
9 direction with contractors instead of having actual -- our  
10 own contractors or our own employees working for the  
11 Department of Defense in a civilian capacity, relying more  
12 on that?

13          Dr. Lockwood: I will note that the use of contractors  
14 in general is very costly to the Department. In many  
15 cases, the Department is paying a heavy premium rate for  
16 the use of contractors.

17          So, rather than necessarily take the expedient route  
18 of simply contracting out for that additional labor  
19 support, I would encourage instead the Department to  
20 correctly align incentives for the management of its own  
21 civilian personnel.

22          Senator Mullin: Is it -- because we are paying a much  
23 higher price to have outside contractors. And so, if we  
24 can pay that wage for outside contractors, what is it that  
25 is keeping our Government, us, from upping the wages of



1 individuals?

2           Because we have -- we are literally losing employee  
3 contractors at Tinker because they are getting picked off  
4 by outside industries. Just give them a \$10,000 sign on  
5 bonus, and then we are turning back around and hiring them  
6 as contractors to come back in and work on the base for an  
7 exuberant amount more.

8           Dr. Lockwood: You are absolutely correct.

9           Senator Mullin: So, what do we need to do to change  
10 that here in Congress?

11          Dr. Lockwood: Right. I will note that currently the  
12 Department of Defense does not have the salary  
13 flexibilities that it needs in order to pay workers ongoing  
14 wage.

15          It is bound to the Federal wage schedule, which has  
16 been superseded several times by statute, creating great  
17 distortions in that wage that is actually offered to  
18 workers on the ground. Furthermore, the structures that  
19 surround civilian hiring are cumbersome, and it is very  
20 difficult for civilian employees of the Department,  
21 civilian managers to actually manage that workforce  
22 effectively.

23          Dealing with contractors is far simpler. If you need  
24 to dismiss someone for underperformance, you can do that  
25 immediately. You don't need to justify it. You don't need

1 to go through a year's worth of write ups and large paper  
2 trail, and your job will not be in any way threatened by  
3 spurious complaints to the Inspector General.

4 So, as a result of this, the use of contractors is  
5 very expedient, but incredibly costly to the taxpayer.

6 Senator Mullin: But -- I agree with that. We also  
7 need to talk about direct hiring, which we have done this  
8 in McAllister Ammunition Plant, which Mr. Taylor, I was  
9 going to ask you about that because onboarding also takes  
10 forever to bring them on.

11 People aren't going to wait six months for a job to on  
12 board on going through the process, so direct hiring is  
13 important. But going back to this, and I will wrap it up  
14 real quick, Mr. Chairman, if we are -- we are not saving us  
15 a dollar by keeping our wages down.

16 We are -- it is costing us because we are all we are  
17 doing is gaming a system by going out and hiring  
18 contractors who come in and do the same job because it is  
19 faster, but actually it is because we need the workforce.

20 So, we, here in Congress, really need to start looking  
21 at the wages that we are paying and get on a scale to what  
22 it is today. I mean, look at how much wages have increased  
23 in the last four years.

24 I mean, it is astronomically, right, and we haven't  
25 actually adjusted our pay wage at a serious look to keep up

1 with inflation, especially with inflation being at 17  
2 percent. We haven't actually adjust that in over two  
3 decades almost. Is that correct?

4 Dr. Lockwood: That is absolutely correct. The  
5 Federal wage system is an antiquated relic of the 70s,  
6 where we set wages in specific bends, binding occupations  
7 together that no longer bear any relation to one another.

8 Furthermore, we apply this antiquated methodology to  
9 an unrepresentative set of data that is currently collected  
10 by the Department of Defense. Completely redundant, in my  
11 personal opinion, to that already collected by the Bureau  
12 of Labor Statistics, which conducts a much larger and  
13 comprehensive survey of all American professions.

14 Senator Mullin: Thank you. Thank you, Mr. Chairman,  
15 and sorry about going over time.

16 Chairman Reed: Thank you very much, Senator Mullin.  
17 Senator Shaheen, please.

18 Senator Shaheen: Thank you, Mr. Chairman, and thank  
19 you to each of our witnesses for being here today. I think  
20 most of us would agree that the Federal wage system is  
21 broken. It gets hung up on political ideology differences  
22 and trying to fix it, and that is the problem.

23 But I don't know, I think maybe it was you, Mr.  
24 Taylor, who said that we have, my recollection was 9  
25 million job openings, but only 6.5 million workers was

1 -- isn't one of the challenges that we are facing, the  
2 demographics of this country?

3 That we are not producing -- because of our  
4 birthright, we don't have the number of people that we need  
5 to fill the jobs that are being created?

6 Mr. Taylor: Undoubtedly. And I mentioned that, that  
7 we have a birthrate problem. We have had so for the last  
8 two decades. What comes as a surprise to people is you are  
9 talking about a post-COVID impact.

10 During 2020 and 2021, the birth rate dropped 4  
11 percent. We saw a significant -- so it was already on its  
12 way down and then it dropped, and for good reason. No one  
13 wanted to go to a hospital during that period of time.

14 Senator Shaheen: And on top of that, we have had the  
15 most restrictive immigration, legal immigration rates, in  
16 my lifetime in the last six years or so. So, that also  
17 exacerbates the problem. If we can fix our broken  
18 immigration system, we would do much better in terms of  
19 having the workforce that we need.

20 But can you -- one of the things, and I understand  
21 Senator Warren talked about how we were able to out produce  
22 our adversaries during WWII, and one of the ways was by  
23 getting women into the workforce. How can the defense  
24 industrial base better leverage women's participation? I  
25 don't know who might like to answer that.

1 Dr. Johnson: Well, the discussion with Senator  
2 Warren, which I think is exactly on this target, Senator  
3 Shaheen, was about childcare and women not being able to  
4 participate in the workforce, both keeping the numbers  
5 down, but also meaning that at an important developmental  
6 part of their career, they are not in the workforce and not  
7 acquiring the skills, and therefore they can't move up  
8 later, including to supervisory positions.

9 So, you are missing people in a static sense, but also  
10 in a dynamic sense.

11 Senator Shaheen: Childcare is clearly an issue. It  
12 is something that I appreciate having had three children  
13 and having a challenge with childcare for the 30 years that  
14 they were at home.

15 But I think we have got a bigger problem in that as I  
16 have visited schools, that young girls are not as engaged  
17 in the STEM subjects as young boys are. And so, for  
18 robotics competitions, for example, girls are much -- less  
19 likely to participate than young boys.

20 Are there ways that we can encourage girls to think  
21 about those subjects that we are not already doing? Dr.  
22 Lockwood.

23 Dr. Lockwood: Thank you for the question. I have a  
24 young daughter at home, and she told me when she was three  
25 that when she wanted to grow up -- when she grows up, she

1 wants to be a doctor and a mommy and a scientist, and I  
2 want that to be possible for her, so I determined I  
3 certainly was not going to quit.

4 To double down on the childcare issue, I do believe  
5 this is a critical thing, but to your point, it is really  
6 important that the child can envision herself doing the  
7 job. Children are not going to study.

8 They are not going to invest in things that they think  
9 are for other people. And so, the broader we can make  
10 opportunities to engage in after school activities, to put  
11 the robot -- to put the drone remote in the hands of all  
12 the children is a good thing.

13 I will also note that among the developed economies,  
14 the United States has among the shortest school day. This  
15 creates an incredible burden for all working families.  
16 There are in many areas good before and after school --

17 Senator Shaheen: Yes, you don't have to explain that  
18 to me.

19 Dr. Lockwood: Okay.

20 [Laughter.]

21 Senator Shaheen: I understand that.

22 Dr. Lockwood: So, yes.

23 Senator Shaheen: To follow on Senator Hirono's  
24 question about the submarine industrial base, excuse me,  
25 over the next 10 years, the submarine industrial base is

1 going to need to hire nearly 100,000 trained workers at  
2 both primary construction yards and 17,000 people at  
3 vendors to support the supply chain.

4 You talked a little bit about ways that we could  
5 encourage apprenticeships and other ways we could encourage  
6 workers to join in the submarine industry. Are there ways  
7 that suppliers can also improve the labor environment for  
8 skilled workers?

9 Dr. Johnson: Well, I think it is going to take all of  
10 them. That is really interesting. This is about a human  
11 capital strategy.

12 We can decide that we are going to opening a number of  
13 shipyards or whatever we do, but ultimately, your point,  
14 well-crafted HR strategy, where you say we need 100,000  
15 people at this period of time means we will get some  
16 percentage of people from this sector, the supplier  
17 community, the Government, etcetera.

18 This requires a comprehensive strategic overview and  
19 plan. And what we have seen is there are no shortage of  
20 programs within the Federal Government, but they are not  
21 orchestrated, and they are not specifically identified,  
22 time limited, budget limited, etcetera, to get the results.

23 In the private sector, if I said I was going to need  
24 100,000 employees, as has often been in the companies where  
25 I have been, fortune 500 companies, CHRO, you are told five

1 years from now we are going to need this many of these  
2 types of employees in these geographic locales, and we  
3 build a strategy around it.

4 That is HR at its best and it can be done, but very  
5 intentionally.

6 Senator Shaheen: The Portsmouth Naval Shipyard, which  
7 is one of those four public shipyards which shares the  
8 border between New Hampshire and Maine, has taken an  
9 approach that integrates its workforce into decision  
10 making, and that has really kept the workers there. It is  
11 really focused on working with management on good labor  
12 practices. So, I would agree, that is a great way to  
13 better keep people in the workforce. Thank you, Mr.  
14 Chairman.

15 Chairman Reed: Thank you, Senator Shahee. Senator  
16 Budd, please.

17 Senator Budd: Thank you, Chairman. I thank the  
18 witnesses for being here today. As Senator Kaine mentioned  
19 a few moments ago, expanding the Pell Grant for short term  
20 skills based education, it is one of the quickest in the  
21 best ways to combat these labor shortages that we are  
22 talking about today and the ones we have seen around the  
23 country.

24 I think that my proposal, the Pell Act, which the  
25 House is actually taking up this week, is one of the best



1 ways to approach expanding this program. So, my bill  
2 allows a variety of educational institutions to participate  
3 in the grant program with guardrails that empower  
4 institutions to produce high demand workers for high paying  
5 jobs. And that is exactly what we need to build up our  
6 defense industrial base.

7 So, Dr. Lockwood, the need for a strong pipeline,  
8 switching gears here to cyber -- cyber workers. That need  
9 has grown exponentially, given the current threat  
10 environment that we are in. So, a two part question, what  
11 can the DOD learn from the private sector on recruiting and  
12 also retaining cyber talent, and simultaneously, how can  
13 the DOD better compete against the private sector for that  
14 talent pool?

15 Dr. Lockwood: Thank you for the question. I think  
16 one of the key lessons of the private sector is that a four  
17 year degree is not necessary. We need to enable our young  
18 people to become productive workers as soon as possible.

19 And Dr. Johnson has earlier mentioned AI enabled  
20 training. I will just offer that DOD already has  
21 experience with AI enabled training, and particularly in  
22 the IT field, where the Navy some years ago piloted a  
23 program to train its shipboard computer technicians using  
24 an AI assisted digital tutor.

25 This was an incredibly effective training methodology

1 and quickly was brought to bear to skill up, in this case,  
2 an enlisted force, individuals entering without a college  
3 education, and quickly make them wildly productive.

4 The -- not only were they very quickly trained, but  
5 the quality of their training was significantly superior to  
6 those who had gone through the traditional schooling. And  
7 then, sir, I am sorry, could you remind me of your second  
8 question?

9 Senator Budd: How can the DOD better compete against  
10 the private sector for that talent pool? Because they are  
11 going to be using some of these same things that you are  
12 mentioning. So how can we differentiate DOD?

13 Dr. Lockwood: Yes. Thank you. I think one thing  
14 that the Department can offer that the private sector  
15 cannot is purpose that is driven by something other than a  
16 profit motivation. To some extent, the Department will not  
17 always be able to compete on wages. It can compete on  
18 purpose.

19 I would encourage you to develop a revolving door  
20 mindset to make it easy for workers to flow in and out of  
21 public service and private employment. Right now, it is  
22 more of a one way exit than a revolving door, so making it  
23 easy to recapture that talent, to give reentering either  
24 service members or civilian workers time to recover their  
25 career track within the DOD apparatus would be, I believe,

1 very effective. Thank you.

2 Senator Budd: Thank you. So, you know, every high  
3 school or college here with a STEM major, they are aware of  
4 all these opportunities with Google, Amazon, and other big  
5 tech firms.

6 So, do you think the Pentagon can improve its  
7 advertising or public education on severe -- excuse me, on  
8 civilian career opportunities, and what recommendations, if  
9 any, would you have that would allow us to further increase  
10 the visibility of DOD opportunities?

11 Dr. Lockwood: Thank you for the question. During the  
12 time of COVID, DOD and even its industrial partners'  
13 footprint in public schools was significantly curtailed and  
14 it has not recovered. I think face time is very important  
15 with our young people and the public schools provide an  
16 important avenue for that.

17 Senator Budd: So, critical to the defense industrial  
18 base and the DOD civilian workforce is not only hiring  
19 talent, but retaining talent, as you know. Are you aware  
20 of any barriers in OPM's promotion process which could  
21 inhibit retention within the DOD civilian workforce? Dr.  
22 Lockwood.

23 Dr. Lockwood: Yes. Thank you for the question. I  
24 will note that the OPM process for nearly all personnel  
25 actions is quite bureaucratic, and it takes very long time.

1 In many cases also the position descriptions are outdated  
2 and perhaps not well honed for the actual work that needs  
3 to be done. And this would inhibit timely promotion and  
4 advancement if candidates are being screened by OPM against  
5 outmoded job descriptions.

6 Senator Budd: One of the things of my colleagues have  
7 mentioned is the shipbuilding challenges, undersea  
8 submarine building challenges coming up.

9 You know, as the Navy works to expand the size of its  
10 fleet, so what incentives are particular to that would you  
11 suggest for the Department of Defense and the manufacturing  
12 workforce in this particular area related to shipbuilding  
13 and undersea capabilities? Any of you.

14 Dr. Lockwood: We need to draw more workers into this  
15 field. So, in terms of incentive programs, I think we need  
16 to fix the broken Federal wage grade system and, compensate  
17 for these high demand skills.

18 There needs to be a very visible public campaign to  
19 advertise these availabilities and to really put ourselves  
20 out there and say this is critical for the national  
21 defense, and let's all get after it.

22 Senator Budd: Thank you.

23 Mr. Taylor: Senator Budd, just very quickly to that  
24 point, we actually went to the civilian workforce and asked  
25 the question. This is broadly. Only 46 percent of working

1 American, civilians have even considered the Department of  
2 Defense as employer.

3 And when we asked them specifically why, the primary  
4 reason that was cited was a lack of knowledge about the  
5 DOD's culture and their employer brand. So, in addition to  
6 raising salaries and providing all sorts of benefits and  
7 talking about it, we need to sell that this is an actual  
8 opportunity. People just don't think of doing it. They  
9 think about, go to the military or not.

10 Senator Budd: Very helpful. Thank you all.

11 Chairman Reed: Thank you, Senator Budd. Senator  
12 Kelly, please.

13 Senator Kelly: Thank you, Mr. Chairman. And thank  
14 you to our witnesses for being here today. Dr. Johnson, I  
15 appreciated the focus of your testimony on the CHIPS and  
16 Science Act, which I helped negotiate, and I particularly  
17 appreciated your focus on the science and economic  
18 development investment in the science portion of that bill.

19 As you noted, while we were able to provide advanced  
20 appropriations for the Critical Chips Act programs, there  
21 are many other new programs created that are going to rely  
22 on an annual appropriations.

23 Now, I come from 15 years at the space program where  
24 we see this firsthand, but Dr. Johnson, can you expand upon  
25 your testimony and explain how investments in basic science

1 and innovation can yield economic growth, even if we can't  
2 always foresee exactly how those investments will pay off?

3 Dr. Johnson: Yes, Senator. So, as you know, this was  
4 a big revelation to us actually from the 1940s. And it  
5 came out of the war effort accelerated by Sputnik and then  
6 the creation of the space program.

7 And what we have come to understand, and now there is  
8 a lot of data on this, which is summarized in my testimony.  
9 We have a whole book on this topic. Is that when you put  
10 money into basic science, you generate a whole range of  
11 ideas, many of which you don't expect to see.

12 And then you if you have a process of channeling that  
13 into specific applications -- the space program would be  
14 one public purpose program, but there is many other  
15 commercialization, including everything that is brought  
16 through digital computers and the internet, for example,  
17 and mobile telephone communications.

18 That machinery that we have in the United States is  
19 actually pretty strong, the private sector piece. But the  
20 private sector does not invest enough in basic science  
21 because it is all about the spillover effects. It is all  
22 about all those unexpected effects. It is all about being  
23 able to suddenly invent a vaccine because you have got a  
24 new disease you would never heard of before, but you have  
25 that capability and so on.

1           And so, the Federal commitment to science is  
2           fundamental to our economic prosperity but also, Mr.  
3           Chairman, to our national security because this is what we  
4           have been very good at, this is what has propelled us  
5           forward in many ways, and this is what China has learned  
6           from us and what they are doubling down on now. So, we  
7           have to invest more just to stay up with them. I think we  
8           can do even better than that.

9           Senator Kelly: Is it true -- I was always of the  
10          understanding that the private sector is not going to  
11          invest in something that has a return on investment that  
12          goes beyond five years. I don't know if that number is the  
13          number you go by, and that is why it is up to the Federal  
14          Government to be making these basic science investments  
15          because private sector just can't do it if they are not  
16          going to see a return on the money.

17          Dr. Johnson: It can be about time horizon. I think  
18          much more, it is about spill -- spillover effect. So, the  
19          Human Genome Project, for example, shopped around some  
20          private venture capitalists in the 1980s. They turned it  
21          down because they said, look, great project. You are going  
22          to create a lot of knowledge, but we won't be able to  
23          capture the value of that in -- ourselves. It will be  
24          general knowledge.

25          So, the Human Genome Project was funded, as you know,

1 by the Federal Government. Massive success. 300,000 jobs  
2 created, tremendously strong industry. A big part of our  
3 economy, and produces drugs, therapies, and vaccines that  
4 are essential to everybody in this country. But it needed  
5 that public impetus.

6 And this, of course, is what the National Institutes  
7 of Health does really well. But we need more of that. We  
8 need more of that across more sectors.

9 Senator Kelly: Well, as somebody who is always trying  
10 to sell our space program, I would -- you know, stress it,  
11 it is not -- you know, it wasn't about like a product like  
12 Velcro, it was about creating industries, industries that  
13 no longer existed. I mean, our aerospace industry here in  
14 the United States has been a -- become a big part of our  
15 economy. And that didn't exist before, you know, the 1960s  
16 really.

17 So, from a national security perspective, what  
18 opportunities -- I want to connect us to the CHIPS and  
19 Science Act. So, what opportunities are we missing by not  
20 fully funding the CHIPS and Science Act? Because this  
21 could be really a long overdue and historic investment in  
22 American research and innovation.

23 Dr. Johnson: Oh, it is a breakthrough piece of  
24 legislation, absolutely, Senator. That taps into what was  
25 done previously in the 40s and with the space program but



1 it goes much further. And it is a little bit painful that  
2 the appropriation is not followed through.

3 So, the Congress recognized the opportunity and I  
4 think agreed on a very broad bipartisan basis, but you have  
5 got to put some money into it. Then, Senator, I think the  
6 question becomes, what next?

7 What are the next sectors where we want the  
8 breakthroughs? What is the next equivalent of satellites,  
9 next equivalent of the internet, next equipment of mobile  
10 communications? There is a lot of opportunities in  
11 biomanufacturing. There is a lot of opportunities in other  
12 parts of semiconductors.

13 There is opportunities in critical minerals, for  
14 example. There is a long list and I think Congress needs  
15 to engage with that. And I think you should be thinking  
16 about CHIPS and Science Act 2.0, after, of course, you fund  
17 the first version.

18 Senator Kelly: Yes. I had other, you know, some  
19 questions that led to, you know, STEM education. But I  
20 look at basic science and STEM education as being sort of  
21 like kind of in the same bucket. You know, this is like  
22 the seed corn for -- you know, it is the catalyst for what  
23 grows the economy, both education and investment in  
24 science. So, thank you.

25 Dr. Johnson: The National Defense Education Act of

1 1958 and NASA, the two big reactions to Sputnik, they were  
2 both brilliant moves by Congress, Senator. So, I am sure  
3 we can do it again.

4 Senator Kelly: Well, thank you. And, Mr. Chairman, I  
5 have a couple of questions for the record.

6 Chairman Reed: We will accept those, Senator. Thank  
7 you very much.

8 Senator Kelly: Thank you.

9 Chairman Reed: Senator Schmitt, please.

10 Senator Schmitt: Thank you, Mr. Chairman. Dr.  
11 Johnson, I wanted to kind of explore your idea of these  
12 tech hubs. I am from St. Louis area, and St. Louis has  
13 been identified, and there is a lot of assets there.

14 So, you have got NGA, you have got the Taylor  
15 Institute there. There is a lot of alignment that can be a  
16 draw. One of the challenges, I think, as we talk about  
17 workforce is there is a bit of a -- there is a misalignment  
18 in higher education, right.

19 You have got a lot of four years that chase degrees  
20 for enrollment. You have got community colleges trying to  
21 figure out where they fit in. The you have got these  
22 apprenticeship programs that, as you mentioned in your  
23 opening comments, maybe sometimes are limited to what that  
24 particular company might need. So, with that is sort of  
25 the backdrop, how does this actually work?

1           Because am intrigued by this and I think it is an  
2 encouraging idea. We do need to have, I think, an  
3 industrial base that is more widely dispersed. We have  
4 talked about, you know, the dangers in our supply chain.

5           And so, let's just take St. Louis as an example. It  
6 could be anywhere. It could be in Rhode Island or  
7 somewhere else. How does this actually work? How do we  
8 get into, you know, 5 to 10 years in a place where somebody  
9 who wants to work on nuclear submarines, so not necessarily  
10 just the engineer that has got the four year degree -- how  
11 does this work -- how does alignment work in a tech hub?

12          Dr. Johnson: St. Louis is a fascinating example,  
13 Senator, in part because you were one of the country's  
14 leading tech hubs, 100, 120 years ago, right. And one very  
15 unfortunate thing that happened, and I don't have any  
16 particular person to blame on this, is that as innovation  
17 moved East and West Coast, you got less innovation, less  
18 corporate headquarters in St. Louis, but not for any  
19 particular good reason, right.

20          I mean, people have got strange reasons like the way  
21 where airline routes went and so on, but it is not -- you  
22 have got a lot of talent. The talent can't move, doesn't  
23 want to move, shouldn't need to move.

24          I think tying it to -- with the mindset of Senator  
25 Kelly, if we have, if Congress has and if the relevant

1 agencies have priority sectors to pursue and places that  
2 are available, including with State and local support,  
3 which would be making sure the workforce develops, Senator  
4 Scott made very good points about that -- also available  
5 housing, I would say, Senator.

6         So, it is not -- you are not adding 10,000 workers,  
7 but they have no way to live. So, the price of housing  
8 goes up and that means you have got to pay a higher wage,  
9 or they just won't come. So, I think that looking for that  
10 combination, and I think St. Louis scores very highly in  
11 our metrics, because it seems to us that you have exactly  
12 that kind of combination of circumstances, but we found 102  
13 places in 36 States that have potential.

14         And honestly, a country this size, with science being  
15 so important to our economy and to our national defense, we  
16 should be running a massive portfolio of these deep science  
17 investments, looking for ways to commercialize them,  
18 getting those public, private partnerships with State and  
19 local support.

20         But the Federal Government is the catalyst. Without  
21 the Federal Government, you are not going to be able to  
22 move the needle. And we have done it before, and you  
23 agreed to do it again in the CHIPS and Science Act.

24         Senator Schmitt: So that is -- from your answer  
25 there, it seems like that is the research investment side.

1 But on the workforce because I am genuinely curious.

2 So, let's say I am a 17 year old in high school, and  
3 you know, I don't -- I want to pursue this path where, you  
4 know, like there is some immediate opportunities. What  
5 does that look like, or what should it look like for that  
6 individual to try to navigate to get to a place where we  
7 want to be, within that tech hub?

8 Dr. Johnson: So, Senator Scott talked about workforce  
9 planning at the State level. I think that is better on a  
10 State and local than at the Federal level, where he was  
11 matching up incoming investment or defense contractors to  
12 say, we are going to need this kind of jobs over this many  
13 years.

14 He was a match up with people coming out of the high  
15 schools, I think in particular high schools, in the  
16 technical colleges. I think that is exactly the right  
17 thing to do, Senator. I think that apprenticeships are  
18 undervalued by the private sector because you lose the  
19 -- if you train the apprentice, the apprentice leaves, so  
20 the private companies don't want to do it.

21 But from a public policy point of view and from a St.  
22 Louis point of view, more people who have completed  
23 apprenticeships is good for the local economy, particularly  
24 if they don't want to move or are not inclined to move to  
25 the East and West Coast. Then you have got this very

1 strong, trained labor force, including with the middle  
2 skills that we have all been emphasizing, agreeing on.

3 And I think this is a completely bipartisan consensus  
4 across the country as I -- when I talk to people. It is  
5 not politicized at all. Everybody wants something in this  
6 direction. The Federal Government, though, is the critical  
7 catalyst.

8 And then deciding which sectors and lining it up with  
9 the defense industrial base, that is a brilliant piece to  
10 add. Because if we know that submarines are important or  
11 if we know that aircraft are kind of important then -- and  
12 you know there is going to be a 20 year commitment to that  
13 from a national security point of view, then you can plan a  
14 lot more activities around that, including the location for  
15 those innovations.

16 Senator Schmitt: If you guys have anything to add to  
17 --

18 Mr. Taylor: Yes, Senator. The reality is, if I am  
19 going to use the example of that 17 year old, first of all,  
20 he or she needs to know what the opportunities are. So, I  
21 am sitting out in Florida, St. Louis, or wherever I am,  
22 and I just don't even know what the possibilities are by  
23 virtue of my background.

24 And then we have got to specifically articulate a  
25 pathway that may not and oftentimes doesn't require a four

1 year college degree. It could be that young man, if you do  
2 this for six months, this could prepare you for an  
3 apprenticeship that could get you this job, etcetera.

4 So, we literally -- the biggest problem that we are  
5 hearing from young people is they understand what the  
6 Government says it needs or what our country says it needs,  
7 they just don't know the pathway to get there.

8 So, educating, you know, old school guidance  
9 counselors. Like right, everyone is not going to college  
10 and maybe go into the workforce. This is how you prepare  
11 yourselves for that. Those are the two most important  
12 things as we are hearing from younger, potential workers.

13 And we talk to high school students a lot and they are  
14 like, listen, I know what I think I want to do. That  
15 sounds interesting. And if you can pay me \$35 bucks an  
16 hour, 20 years old, why not, without debt from college,  
17 etcetera. I just don't know how that works. So,  
18 articulating to the future workforce how it all works will  
19 go a long way toward solving for these talent challenges.

20 Dr. Lockwood: Bring back shop class. Let them work  
21 with their hands. Let them build things. Let them tinker.  
22 Let them print things with the 3D printer. Let them be  
23 creative. They can see then that there is a path for me to  
24 do these mid skill jobs, that there is dignity in that,  
25 that the country needs that. It is valued. And in that

1 shop class you can make the pitch.

2 Senator Schmitt: Bring back civics and shop class.

3 Let's do it. All right, thank you. Thank you, Mr.

4 Chairman.

5 Chairman Reed: Thank you, Senator Schmitt. Senator

6 Blumenthal, please.

7 Senator Blumenthal: Thank you, Mr. Chairman. Shop

8 class is good. I don't know about in the era of AI,

9 artificial intelligence, how many shop class enlistees

10 there will be, but maybe the nature of shop class should be

11 changed. I want to engage in kind of a thought experiment.

12 I am the CEO of Electric Boat.

13 As you know, Electric Boat in Connecticut makes the

14 most capable and reliable submarines in the world. And if

15 you look at employment patterns at Electric Boat, they have

16 mountains and troughs. The reason they have mountains and

17 troughs is that the Pentagon often changes procurement

18 requirements.

19 We want two submarines a year, no Virginia class. We

20 want one sub, maybe one plus the Columbia class, plus

21 -- you know, if you are a manufacturer, pretty hard to

22 engage in recruiting, hiring, training that involves

23 investment when those procurement commitments are changing.

24 And just to mention the elephant in the room, right now we

25 have no budget for this Fiscal Year.



1           So, the Pentagon is kind of scratching its head and  
2 saying, okay, we think we know what the budget is going to  
3 be. Chairman Reed has done extraordinarily skilled and  
4 excellent work in passing the National Defense  
5 Authorization Act, which provides a basic contour for what  
6 procurement should be, but the money has to be approved.

7           To what extent does this indecision by the Congress  
8 and by the Pentagon, indecision and reversal of decisions  
9 affect the ability to recruit, train, and hire a workforce  
10 like Electric Boat?

11          Dr. Lockwood: The workers will go somewhere else.  
12 They are not going to sit around and wait for us to get our  
13 act together. They have families to feed. So, unless we  
14 can really maintain the continuity of that production  
15 pipeline, which I agree we desperately need, we will  
16 struggle to retain.

17          Mr. Taylor: And the prospect of that, even the  
18 prospect of potentially not knowing, so the idea of not  
19 knowing -- employers, employees or voting with their feet.  
20 So even if you have the employee, they are currently  
21 working in these industries, this level of indecision gives  
22 them an anxiety that will often lead them to come to the  
23 private sector because they are like, at least to there, I  
24 kind of know what I know.

25          Dr. Johnson: Senator, I completely agree with where

1 you are going and what my colleagues just said, but I would  
2 also remind everyone that the V12 Merlin engine that  
3 powered the Spitfire and the Hurricane in WWII and was  
4 decisive for keeping Germany out of Britain, started to  
5 develop in 1929 before there was any public procurement  
6 guidelines for that engine. There was a private sector  
7 innovation, Senator.

8 And what you really need in this country is not just  
9 better organized procurement exactly as you are wanting.  
10 You need people who are pushing on the innovative frontier  
11 for the new stuff the Pentagon is not -- doesn't even  
12 though they want yet, right. And so, how do we incentivize  
13 that?

14 How do we encourage that? How do we build the skills?  
15 And I think the shop class has never been more important,  
16 Senator, because I think losing those manual skills, losing  
17 our thinking with our hands is a huge disadvantage when we  
18 think about the world, because the engineers who built the  
19 Merlin, who built the Spitfire, who built the American  
20 effort in WWII were very hands on people, once they  
21 understood how to bend metal.

22 And that is the key to a lot of these innovations that  
23 we are talking about.

24 Senator Blumenthal: You know, I think what you are  
25 saying about shop class, which is not just what happens in

1 the classroom, but the manual skills and the instinctive  
2 approach to how to put things together and make them work,  
3 that is what Electric Boat is trying to hire, the welders,  
4 the electricians, the pipefitters.

5 People who are skilled at the trades. And not only in  
6 shop class, but frankly, in high school, I think we need to  
7 do a better job of selling people, future workers, on the  
8 idea, you know, you can have not just a job, but a career,  
9 a real career. Making a lot more money than let's say my  
10 four children. They were all educated in liberal arts  
11 institutions. Three of them are lawyers like me.

12 But there are a lot more lawyers per person maybe than  
13 there need to be. And we need more of the folks who can do  
14 the work at Electric Boat, with the carriers that really  
15 provide not just financial gratification, but real dignity,  
16 the dignity of work. You are nodding, so I assume you  
17 agree.

18 Dr. Johnson: Dr. Lockwood said it already -- sorry,  
19 Dr. Lockwood said. I totally agree. Dignity and status  
20 and purpose, but you have got to also pay people good  
21 money, right. Because people have to live, and that is a  
22 question of how much you pay them relative to what it cost  
23 to live in the areas that you are trying to develop.

24 But if you get that right, which we have done in this  
25 country before, Senator Blumenthal, and you have got very

1 strong, obviously, places in Rhode Island and in  
2 Connecticut that also get this right, then we can do  
3 incredible things.

4 Mr. Taylor: Senator, there is --

5 Senator Blumenthal: Go ahead. Mr. Taylor.

6 Mr. Taylor: Yes. I would just submit to you that we  
7 oftentimes talk about and believe that our talent pool must  
8 come from the K through 12 system. We increasingly have  
9 that middle group, that middle 45 to 55 year old who is now  
10 displaced, wants to work. You want to talk about dignity  
11 of work, and so many of our training programs  
12 disproportionately focus on young people.

13 And that is good, but we are ignoring that there is a  
14 significant swath of the population that is available,  
15 wants that dignity of work, needs to do it, and we don't  
16 provide reskilling and upskilling programs from the  
17 Government, frankly, to them.

18 We will give you a Pell Grant all day for the kid, but  
19 what happens to that 45 year old whose job has been  
20 significantly changed on the account of technology and they  
21 could become a welder, but themselves don't know how to do  
22 that and don't think there is a pathway to that.

23 So, I would not ignore that significant portion of our  
24 population that wants to work but doesn't know how to  
25 reskill.

1           Senator Blumenthal: I thank you all for your  
2 insights. And by the way, Chairman Reed and I have just  
3 come back from a trip to Ukraine, and the Ukrainians are  
4 taking what seem to be often very low tech drones, and  
5 because they have those manual skills, they are able to  
6 reconfigure them, I don't know what the technical term  
7 would be, and make them lethal.

8           Now, they still need arms. They need support. They  
9 need the resources. They are sadly lacking, and we need to  
10 give it to them in the supplemental that is now before the  
11 House that we passed here in the Senate. But they have  
12 been extraordinarily innovative and creative because they  
13 have many of those manual skills. Thanks, Mr. Chairman.

14          Chairman Reed: Thank you, Senator Blumenthal. And  
15 thank you for your not just participation today, but for  
16 your willingness to travel to Ukraine and to do so many  
17 other things.

18          But this has been a very, very helpful and useful  
19 panel. I would like to touch on, again, on something that  
20 was mentioned, but that is the perception of working for  
21 either the Department of Defense or a defense company seems  
22 to be very negative. And that is an issue we have to deal  
23 with. And let me just quickly, Mr. Taylor, Dr. Johnson,  
24 Dr. Lockwood.

25          Mr. Taylor: Yes, we actually -- I don't -- at the end

1 of the day, it is far more attractive to most employers.  
2 They know of the brand name. You know, it is like Lockheed  
3 Martin, Boeing, etcetera, that is a far more attractive  
4 opportunity to them than -- and they don't even think about  
5 the opportunities.

6 As I know, half of the American civilian workforce has  
7 said they don't think about the Department of Defense  
8 proper. So, to the extent that we could create -- this is  
9 what the job is, it doesn't matter if it is at the  
10 Department of Defense or the rest of the industrial base, I  
11 think we could solve for some of the problems. Private  
12 sector has a one up on the Government in those roles.

13 Dr. Johnson: It is a very interesting problem that  
14 you are articulating Senator because I do think serving the  
15 armed forces is still prestigious and sought after. I  
16 served in the military when I was young, not in this  
17 country unfortunately. I did register for Selective  
18 Service when I was eligible. I got turned down because I  
19 was slightly too old, which was disappointing.

20 But I think the reason for that -- and those were  
21 regarded as good things and those were great experiences.  
22 And I think that is because we have this perception and  
23 correct understanding that you build skills in those  
24 military roles and somehow -- and perhaps it is about the  
25 wage classification system, as was articulated.

1 I am not saying that there isn't -- there aren't deep  
2 structural problems, but somehow that same prestige, that  
3 same conviction that you are building, leadership -- we  
4 have great students in our MBA classes who are former  
5 military, for example, and who are terrific leaders, and  
6 everybody automatically assumes that is what you get if you  
7 are bringing a lieutenant or captain into an MBA program.

8 And somehow that is not coming across in the defense  
9 industrial base. And I think that -- I think Dr. Lockwood  
10 has got some very good ideas, and as do you Senator, about  
11 how to fix that. But I think the way you articulate just  
12 in those terms is exactly right.

13 Chairman Reed: Thank you. Dr. Lockwood, please.

14 Dr. Lockwood: Yes, I think it is to some extent about  
15 prestige. It is also about what people know about. I will  
16 note that there has been a great consolidation in the  
17 military footprint. When you ask young people, do you know  
18 a veteran, fewer than ever say yes. So, we just need to be  
19 out there in the community.

20 We need to say that this is not someone else's duty.  
21 This is not something I can outsource. This is our  
22 responsibility as all Americans, to participate in some way  
23 in making sure that our country and, you know, that of our  
24 allies is safe.

25 So, I think if we couch it as a community

1 responsibility, and if we put ourselves out there in new  
2 ways, that both our partners in the industrial base and our  
3 defense civilian workforce can get more of the attention  
4 that it rightly deserves. Thank you.

5 Chairman Reed: Well, thank you all for excellent  
6 testimony. And as I said initially, this is not a one  
7 stop. We look forward to your collaboration and your input  
8 too. If there are issues that we are not dealing with, or  
9 we should be dealing with, or if there is advise you can  
10 give us, don't hesitate, please.

11 Thank you very much. With that, I will adjourn the  
12 hearing.

13 [Whereupon, at 11:32 a.m., the hearing was adjourned.]

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