

GENERAL DYNAMICS
Bath Iron Works

Shipbuilding Apprenticeship: A Qualitative Analysis

Scott Christman, Ph.D.
NSRP – Workforce Development Panel

March 2023

Shipbuilding Apprenticeship: A Qualitative Analysis

Prime/Lead: GD-Bath Iron Works

Project Idea	Objectives
<p>Share current best practices relating to <u>shipbuilding apprenticeship programs</u>:</p> <ul style="list-style-type: none"> • Team with Shipyards and Industry Experts <ul style="list-style-type: none"> ➢ Participating Shipyard: Up to 8 Shipyards ➢ Tech. Consultant: American Apprenticeship Round Table (www.aart-us.org) • Incorporate best practices and new technologies 	<ol style="list-style-type: none"> 1. Coordinate & fund a national multi-day conference 2. Extract, study, synthesize and share current best practices 3. Share the findings and recommendations with the shipbuilding industry and stakeholders.
Deliverables/Benefits/ROI	Financial
<ul style="list-style-type: none"> • Curriculum/road map for starting, maintaining or expanding a program • Enhanced competencies and qualifications of entry- and mid-level new hires • Trained employees = increased skills, first time quality, job satisfaction, motivation, innovation, and process improvement 	<p>\$150k (no cost share) BIW Lead:</p> <ul style="list-style-type: none"> • Dedicated Organizational Development Department Project Lead • 6 participating Shipyards • Austal, NASSCO, Ingalls, Marinette, NNS, BIW • American Apprenticeship Round Table

Shipbuilding Apprenticeship: A Qualitative Analysis

Prime/Lead: GD-Bath Iron Works

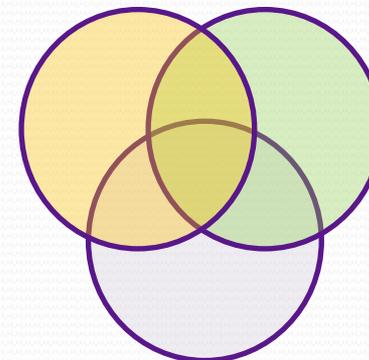
Project Idea

Share current best practices relating to shipbuilding apprenticeship programs:

- Team with Shipyards and Industry Experts
 - Participating Shipyard: Up to 8 Shipyards
 - Tech. Consultant: American Apprenticeship Round Table (www.aart-us.org)
- Incorporate best practices and new technologies/equipment

Occupation

Related Instruction



Mentoring

Shipbuilding Apprenticeship: A Qualitative Analysis

Prime/Lead: GD-Bath Iron Works



Objectives

1. Coordinate & fund a national multi-day conference
2. Extract, study, synthesize and share current best practices
3. Share the findings and recommendations with the shipbuilding industry and stakeholders.

Shipyards that have agreed to participate:

~~Austa~~ USA Philly Ship

NASSCO

Ingalls Shipbuilding

Electric Boat

Marinette Marine

Newport News Shipbuilding

Bath Iron Works

Shipbuilding Apprenticeship: A Qualitative Analysis

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Project Tasks:

1. Design Survey of Current Practices in Shipbuilding Apprenticeship
2. Data Gathering
3. Conduct Roundtable Conference and Follow-Up (April '23)
4. Compile Results
5. Provide a Final Report

Shipbuilding Apprenticeship: A Qualitative Analysis

Prime/Lead: GD-Bath Iron Works

Project Tasks:

1. Design Survey of Current Practices in Shipbuilding Apprenticeship (Completed)
2. Data Gathering (50%)
3. Conduct Roundtable Conference and Follow-Up (April 12, 2023)
4. Compile Results (June 15, 2023)
5. Provide a Final Report (Sept. 15, 2023)

Shipbuilding Apprenticeship and Workforce Development Survey

Purpose of the survey: To identify current apprenticeship and workforce development requirements, methods and processes, challenges, and opportunities with respect to the following: recruiting, admissions and hiring; education and training; and completion and retention.

I. Recruiting

A. Rate the effectiveness of methods used to recruit/attract individuals to your apprentice program

	N/A (1)	Ineffective (2)	Somewhat Effective (3)	Effective (4)	Very Effective (5)
1. Newspapers / Job Oriented Publications	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Radio / TV Advertising	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. College / Career Fairs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. H.S. / Vocational School Relationships	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. H.S. Guidance Couns. / Career Coaches	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Current / Former Employee Referrals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Union Halls / Relationship	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Company Website	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Company Hosted Job Fairs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Public Display (Buses / Billboards, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Other _____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please provide feedback/details on your effective and very effective methods of recruiting as identified in section I.A

B. Do you utilize any methods other than the ones indicated above to attract/recruit your incumbent workforce for your apprentice programs? If so, please list the methods and provide details for each.

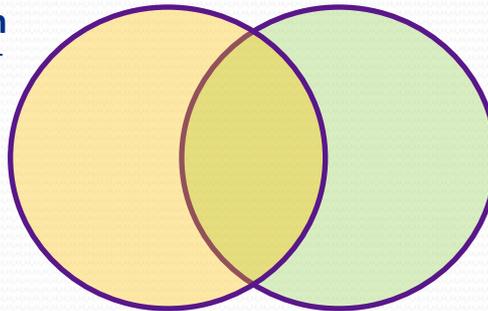
C. How do you determine return on investment (ROI) with respect to your recruiting methods?

Apprenticeship Startup Process

1. What is the purpose of the program? What do we hope to accomplish? What are the expectations for outcomes/competencies?
2. Is “apprenticeship” necessary to serve our needs? Could we accomplish the same thing with a well-managed “training” program?
3. What specific occupations would we want to involve in a training program or apprenticeship?
4. Evaluating OJT progress
5. Considering Related Instruction
6. Defining a probationary period for the program in accordance with 29 CFR part 29
7. What could hiring process look like?
8. Establishing rates of pay for apprentices and working within a CBA
9. Drafting program standards
10. VA Benefits
11. Drafting necessary MOA’s to the labor agreement to make the program work
12. Establishing a regular Apprenticeship Council

Apprenticeship

Related Instruction
Minimum 144 hrs per year



On-the-Job
Minimum 1-year (2000-hrs)

BIW Pathways

Pathways (pre-hire)

- CTE's and High Schools
- **Pre-Hire Training (SMCC)**
 - Manufacturing Technician
 - Marine Design
 - Welding
 - Marine Painter

WELDING ACADEMY

Experience why "Bath Built is Best Built" and train for a career in welding at BIW.




WHAT

Topics covered include:

- Out of position filler welds, groove welds, vertical welds, stick and flux core/mig
- Oxy and plasma cutting
- Plasma arch gauging
- and more!

WHEN

ROLLING CLASSES
Inquire now to get the process started!

WHERE

SMCC Welding Lab
54 Orion St.
Brunswick Landing

GRANT FUNDED

Free Training & \$500 Weekly Attendance Incentive

Prerequisites:

- At least 18 years old
- High School diploma, GED or HiSet
- U.S. Citizenship and/or authorization to work in the US required. Additional hiring restrictions may apply.
- Preference given to those with previous welding experience or training
- Testing may be required

Thank you to our partner:
 **GENERAL DYNAMICS**
 Bath Iron Works

INTERVIEWS: General Dynamics Bath Iron Works will conduct job interviews with qualified applicants upon successful completion of the program.

For More Information and to Get Started Now,
 email workforceregistration@smccME.edu or call 207-741-5955

Southern Maine Community College does not discriminate on the basis of race, color, religion, national origin, sex, sexual orientation, disability, age or marital, parental, or veteran's status in its programs and activities. For more information, please call 207-741-5955. Applicants who are not US Citizens and are from prohibited countries as designated in the US International Traffic in Arms Regulations may be disqualified from working at SMCC. For a current list of prohibited countries please visit the following website: https://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&ty=html&tid=622.1.129_11

Experience why "Bath Built is Best Built" and train for a career in shipfitting, pipefitting and trades at BIW.

MANUFACTURING TECHNICIAN TRAINING



WHAT

Topics covered include:

- Blueprint reading
- Technical math
- Hand & power tool operation & safety
- Operation of air tools
- Oxy cutting
- Tack welding
- Basic layout
- Material handling
- Drilling & fastening
- and more

WHEN

ROLLING CLASSES
Inquire now to get the process started!

WHERE

SMCC Midcoast Campus
29 Sewall Street,
Brunswick, ME

GRANT FUNDED

Free Training & \$500 Weekly Attendance Incentive

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MARINE DESIGN TRAINING

Learn Marine Design including 3D Modeling & Visualization

Develop drafting skills for fabrication and installation drawings

Resolve design related problems during ship construction



WHEN

COMING SOON!
3 week training
Mon-Fri, 7:30 a.m. - 3 p.m.

WHERE

SMCC Midcoast Campus
29 Sewall Street, Brunswick, ME

GRANT FUNDED

Free Training & \$500 Weekly Attendance Incentive

Prerequisites:

- At least 18 years old
- High School diploma, GED or HiSet
- U.S. Citizenship and/or authorization to work in the US required. Additional hiring restrictions may apply.
- Unemployed or underemployed and a resident of Maine.
- Good computer skills (i.e., proficiency with Microsoft Office tools) required
- Ability to read, interpret and follow technical procedures, standards and work instructions required
- 3D CAD or AUTOCAD software preferred
- Testing may be required

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The SMCC Pre-Hire Training

A pre-hires 3-week training class that SMCC conducts to the public.

Experience why "Bath Built is Best Built" and train for a career in shipfitting, pipefitting and trades at BIW.

MANUFACTURING TECHNICIAN TRAINING



GRANT FUNDED
Free Training & \$500 Weekly Attendance Incentive

WHAT
Topics covered include:

- Blueprint reading
- Technical math
- Hand & power tool operation & safety
- Operation of air tools
- Oxy cutting
- Tack welding
- Basic layout
- Material handling
- Drilling & fastening and more

WHEN
ROLLING CLASSES
Inquire now to get the process started!

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SMCC Midcoast Campus
29 Sewall Street,
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Prerequisites:

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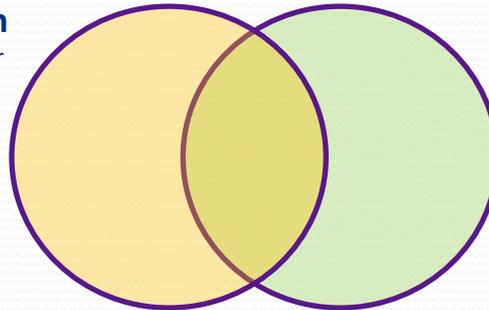
1/30/2023 Manufacturing Technician Training						
BIW Schedule B51 1/30/2023 - 2/17/2023						
In-Class sessions unless otherwise indicated						
Session	Date	Instructor	Time	Hrs	Topic	Location
1	Monday, January 30, 2023	Brenda/Candy	8:00a-9:00a	1	Introduction	MATEC 203
2		Morgan	9:00a-11:00a	2	Safety	MATEC 248
3		Morgan	11:00a-12:00p	1	Print Reading	MATEC 248
4		Morgan	12:30p-2:30p	2	Print Reading	MATEC 248
5		Dave	2:30p-4:30p	2	OSHA	MATEC 248
6	Tuesday, January 31, 2023	Jenny	8:00a-12:00p	4	Math	MATEC 248
7		Morgan	12:30p-4:30p	4	Print Reading	MATEC 248
8	Wednesday, February 1, 2023	Morgan	8:00a-12:00p	4	Print Reading	MATEC 248
9		Andy	12:30p-4:30p	4	Skills Training	MATEC 117
10	Thursday, February 02, 2023	Andy	8:00a-12:00p	4	Skills Training	MATEC 117
11		Andy	12:30p-4:30p	4	Skills Training	MATEC 117
12	Friday, February 3, 2023	Mitch	8:00a-12:00p	4	Resume/Interviewing	MATEC 203
13		Dave	12:30p-4:30p	4	OSHA	MATEC 248
14	Monday, February 6, 2023	Morgan	8:00a-12:00p	1/3	Print Reading/Skills	MATEC 248/117
15		Jenny	12:30p-4:30p	4	Math	MATEC 248
16	Tuesday, February 7, 2023	MEP & Morgan	8:00a-12:00p	4	LEAN Manufacturing	MATEC 248/246
17			12:30p-4:30p	4	LEAN Manufacturing	MATEC 248/246
18	Wednesday, February 8, 2023	Morgan	8:00a-12:00p	4	Skills Training	MATEC 117
20		Morgan	12:30p-4:30p	4	Skills Training	MATEC 117
21	Thursday, February 09, 2023	Jenny	8:00a-12:00p	4	Math	MATEC 248
22		Dave	12:30p-4:30p	4	OSHA	MATEC 248
23	Friday, February 10, 2023	Andy	8:00a-12:00p	4	Skills Training	MATEC 117
24		Andy	12:30p-4:30p	4	Skills Training	MATEC 117
25	Monday, February 13, 2023	Penni/Dewey	8:00a-12:00p	4	Virtual Welding	MATEC 136
16		Penni/Dewey	12:30-4:30p	4	Welding	54 Orion Street
27	Tuesday, February 14, 2023	Penni/Dewey	8:00a-12:00p	4	Welding	54 Orion Street
28		Penni/Dewey	12:30p-4:30p	4	Welding	54 Orion Street
29	Wednesday, February 15, 2023	Penni/Dewey	8:00a-12:00p	4	Welding	54 Orion Street
30		Penni/Dewey	12:30p-4:30p	4	Welding	54 Orion Street
31	Thursday, February 16, 2023	Penni/Dewey	8:00a-12:00p	4	Welding	54 Orion Street
32		Penni/Dewey	12:30p-4:30p	4	Welding	54 Orion Street
33	Friday, February 17, 2023	Penni/Dewey	8:00a-12:00p	4	Plasma	54 Orion Street
34		Penni/Dewey	12:30p-4:30p	4	Plasma	54 Orion Street

Career Ladder

BIW (1-Yr) Pre-Apprenticeship

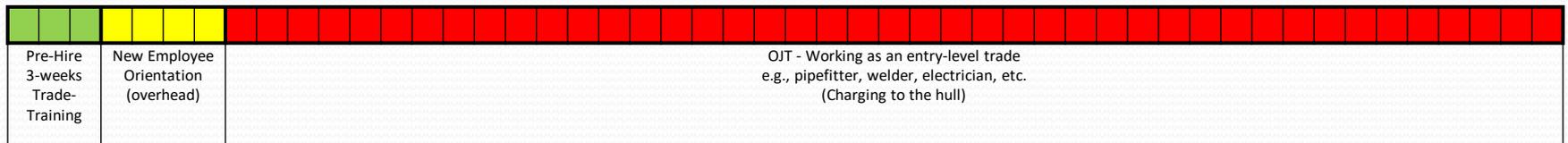
A 1-year mentorship program that BIW chooses to call a Pre-Apprenticeship. It's a program where anyone hired from the community college's 3-week Training, becomes registered as pre-apprentices with the DOL, then mentored as an apprentice throughout entire first year of employment.

Related Instruction
Minimum 144 hrs per year



On-the-Job
Minimum 1-year (2000-hrs)

2000-Hours



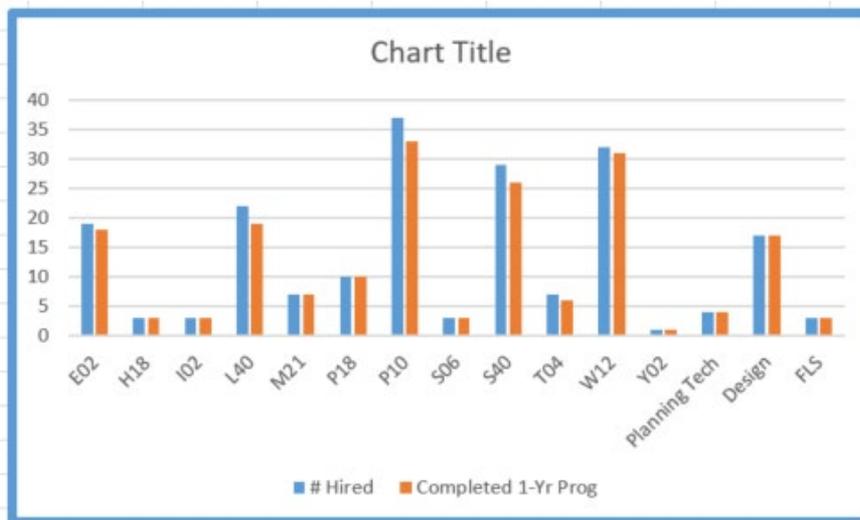
The BIW Pre-Apprentice Program

Hired: 197 trainees from the community college's Training – and subsequently registered them with the DOL as apprentices

- After 1st year: 93% of them were still here
- After 2nd Year: 87% of them were still here
- After 3rd Year: 82% of them were still here

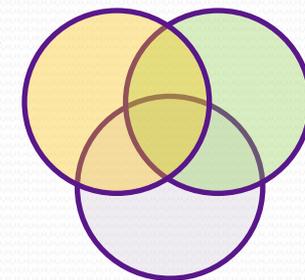
Apprentice Demographics

% Female	33%
% Minority	11%
% Youth (16-24)	16%



Occupation

Related Instruction



Mentoring

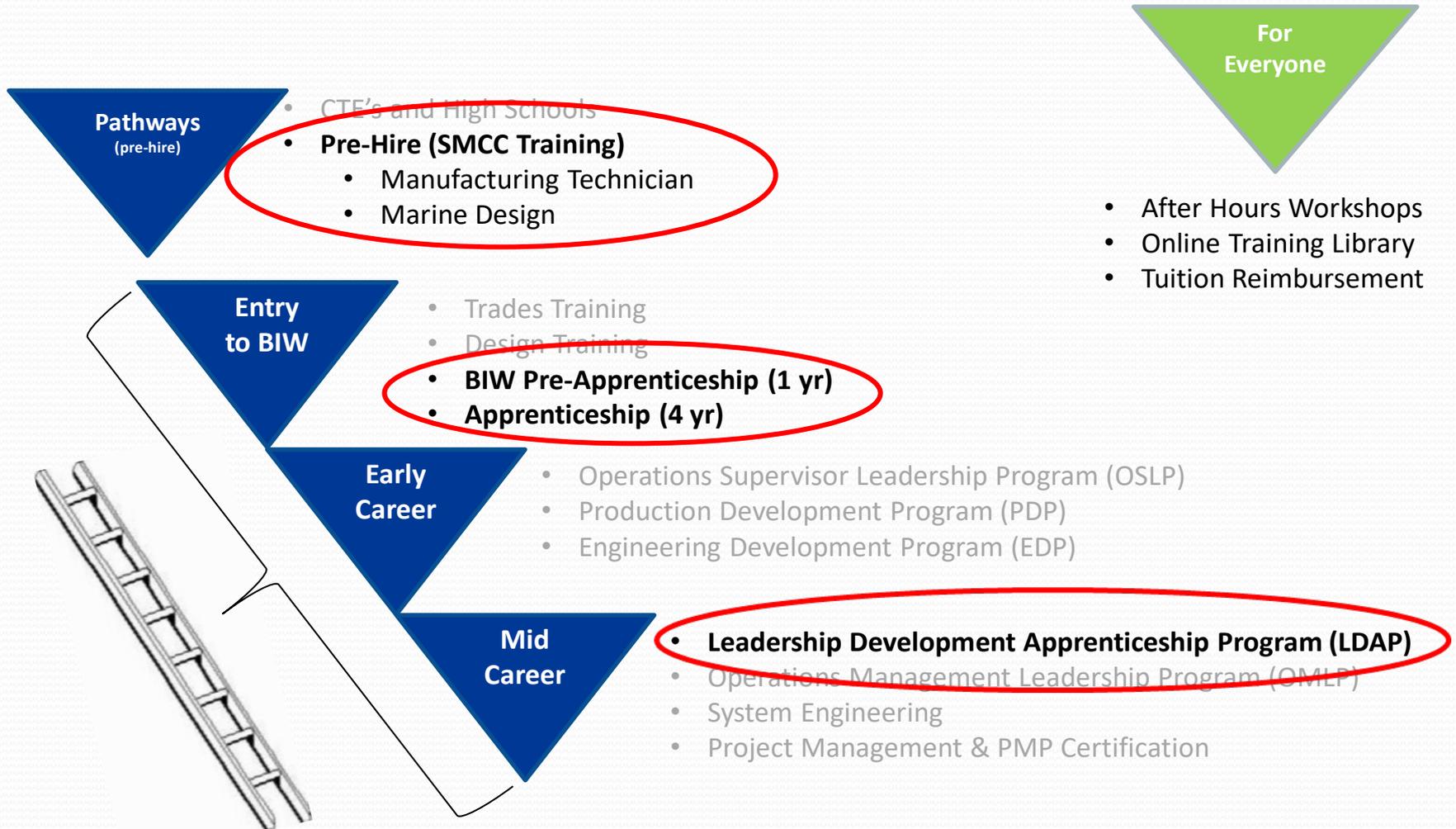
Mentorship: The Secret Sauce

OCCUPATION: Basic Production Technician				
SOC: 17-3029.09		NAICS Code: 336611		
TERM: 2000 hours		RTI Hours: 144 hours		
SKILLS TO BE LEARNED ON THE JOB	Hours Required	Hours Attained	Proficient As of Date	Supervisor Signature
PRODUCTION TECHNICIAN AREA HOURS				
A. Panel Line / Assembly Building				
B. PO2/RSU				
C. Ultra-Hall				
D. Land Level				
E. Water / Ships Completion				
F. Fab				
SUB-TOTAL				
PRODUCTION TECHNICIAN SKILLS CHECKLIST				
Set up and verify the functionality of safety equipment				
Adhere to all applicable regulations, policies, and procedures for health, safety, and environmental compliance				
Calibrate or adjust equipment to ensure quality production, using tools such as calipers, micrometers, height gauges, protractors, or ring gauges				
Inspect finished products for quality and adherence to customer specifications				
Monitor and adjust production processes or equipment for quality and productivity				
Troubleshoot problems with equipment, devices, or products				
Test products or subassemblies for functionality or quality				
Select cleaning materials, tools, or equipment				
Set up and operate production equipment in accordance with current good manufacturing practices and standard operating procedures				
Plan and lay out work to meet production and schedule requirements				
Install new manufacturing equipment				
Start up and shut down processing equipment				

MAINE Apprenticeship Program		MAINE APPRENTICESHIP PROGRAM		MAINE DEPARTMENT OF LABOR
APPRENTICE /PRE-APPRENTICESHIP AGREEMENT - REGISTRATION			APPENDIX B	
PART A: APPRENTICE/Pre-apprentice		COMPLETE 1 THROUGH 8		PLEASE PRINT CLEARLY
1. Name (FIRST, MIDDLE, LAST)		Social Security Number		Questions 4 and 5 Required
Street				6A, 6B and 6C (Voluntary)
Town		State Zip		4. Veteran Status
Phone		Cell		<input type="checkbox"/> Non-Veteran
E-mail				<input type="checkbox"/> Veteran
2. Date of Birth (Mo., Day, Yr.)		3. Gender (Required)		5. Education Level
		<input type="checkbox"/> Male <input type="checkbox"/> Female		<input type="checkbox"/> 8 th Grade or Less
				<input type="checkbox"/> 9 th to 12 th Grade
				<input type="checkbox"/> High School Diploma
				<input type="checkbox"/> GED/HISET
				<input type="checkbox"/> High School or Greater
				<input type="checkbox"/> Post-secondary or Technical Training
				<input type="checkbox"/> Other - Explain:
7A. Electronic Signature of Apprentice/Pre-apprentice		Date Signed		Required
7B. Electronic Signature of Parent or guardian (if 17 years or under)				8A. Are you legally eligible to work in the U.S.?
				<input type="checkbox"/> Yes <input type="checkbox"/> No
				8B. If male, are you registered with Selective Service?
				<input type="checkbox"/> Yes <input type="checkbox"/> No
This agreement does not constitute a certification for the employment of the apprentice on federally financed or assisted construction projects. The program sponsor and apprentice/pre-apprentice agree to the terms of the Apprenticeship Standards incorporated as part of this Agreement. The sponsor will not discriminate in the selection and training of the apprentice/pre-apprentice as outlined in state and federal law. This agreement may be terminated by either of the parties, citing cause(s), with notification to the Maine Apprenticeship Program. For Pre-apprentice only: This document serves as a letter of intent between the sponsor and the pre-apprentice reflecting the intent of the sponsor to provide due and preferential treatment to the pre-apprentice in the selection process for future apprentices. The work processes listed in the standards are part of this agreement.				
PART B: SPONSOR		COMPLETE 14 THROUGH 21		
9. GENERAL DYNAMICS BATH IRON WORKS 700 WASHINGTON STREET BATH, MAINE 04530 207-443-3311		10A. Trade/Occupation: Basic Production Technician (4000)		
		10B. O*NET SOC: 17-3029.00		
		10C. NAICS CODE: 336611		
14. Apprentice Start Date: 09/21/2020		15A. Credit for Prior Classroom Training in hours:		11. Ratio AP - JP 58 - 3
16. % Related Instruction Paid By Sponsor: 100%		17. Related Instruction Provider(s): Varied (MCCS & National Vendors) BIW - MMA - SMCC		12. Term Hrs. 2000
		18A. Pre-Apprenticeship \$		13. Probationary Period 480 hours
		18B. Apprentice's starting hourly wage \$ 24.45		15B. Credit for prior On The Job Learning in hours:
		18C. Journeyworker's Hourly Wage \$ 25.69		
		18D. Term in Hours		
		18E. % JW Rate		
		18F. \$ Rate per hour		
19. Printed Name of Sponsor Representative: J. Scott Christman		Title: Manager, Trade Training & Apprenticeship		21. Contact Information Sponsor Designee
20. Electronic Signature of Sponsor		Date Signed: 09/21/2020		J. Scott Christman Joseph.Christman@gdbiw.com
PART C: TO BE COMPLETED BY MDOL THE REGISTRATION AGENCY				
Maine Apprenticeship Program Maine Department of Labor State House Station 55, Augusta, ME 04333-0055 PH: 207-623-7966 TTY USERS: MAINE RELAY 711		22. Electronic Signature (Registration Agency)		23. Date Registered
24. Apprentice Identification Number:		Program use only: EXCEL ___ RAPIDS ___ Welcome Packet ___		

Results: Significantly higher retention rates

BIW Pathways & Career Ladder



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NASSCO

Ingalls Shipbuilding

Electric Boat

Marinette Marine

Newport News Shipbuilding

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Apprenticeship Round Table Meeting:

April 12 – 14, 2023

Hilton Garden Inn / NNS

180 Regal Way

Newport News, VA 23602

Shipyards that have agreed to participate:

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NASSCO

Ingalls Shipbuilding

Electric Boat

Marinette Marine

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Questions?