

**MARITIME-RELATED SKILLS ASSESSMENT AND TRAINING  
NEEDS OF WORKERS IN SHIPBUILDING AND  
SHIP REPAIR SECTOR**

**Executive Summary**

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## BACKGROUND

1. Ship building and ship repair (SBSR) is an emerging sector in the Philippine maritime industry. There are around 114 shipyards operating in the country and more of these shipyards are building more ships of higher tonnages.
2. Increase in order books due to the presence of international shipbuilders in the country such as Tsuneishi, Hanjin and Keppel has earned recognition for the country as the 4th shipbuilding nation after South Korea, Japan and China.
3. In line with the country's effort in promoting and developing the SBSR sector, the study will serve as a concrete basis for the development of programs and policies for shipyard manpower.
4. The study generates information on skills available vis-à-vis skills required in Shipbuilding and Ship Repair (SBSR) sector to be able to identify skills gaps and thereafter propose strategies and approaches to address the identified gaps.
5. Study is a collaborative undertaking with the Maritime Industry Authority (MARINA).
6. Data were taken from 1) survey questionnaires (2 sets) – Questionnaire 1 (Q1) – Company profile – includes employer and worker's data and Questionnaire 2 (Q2) on the Qualification requirements of employers, and 2) MARINA data (workers data) from a survey conducted in November 2012 until October 2013. Data gathering activities had commenced in July and completed in October 2015. The study employed total enumeration of SBSR companies considering its small population. Out of 100 shipyards in operation in the country at the time of data gathering, 95 shipyards were visited and administered with 2 sets of questionnaires. There were 68 companies that responded Q1 and 73 companies filled-out Q2.

## FINDINGS OF THE STUDY

### 1. Company Profile

The Company Profile is classified into Company and Workers. Company Profile is the categorization of companies according to the nature of business operation. Workers Profile, on the other hand, includes sex, age, education, salary, available skills, competency level, and trainings attended.

**Company**

The Company Profile reveals that 54 SBSR companies were engaged in both shipbuilding and ship repair, 7 in ship repair and maintenance and one was in shipbuilding only while 8 have no response. During the data gathering activities, it was noted that some of the SBSR companies visited were into the commercial business while others were purely catering to the ship repair and maintenance of their own fleet, usually fishing vessels.

**Workers (Available skills of shipbuilding and ship repair workers)**

A total of 2,660 workers in SBSR sector were employed in 68 SBSR companies distributed according to occupational categories: work preparation/production (skilled/ semi-skilled workers) (62%), heavy equipment operators (12%), administrative personnel (11%), designers/engineers (8%), managers (6%), and other positions (0%).

**Sex**

- Data from company profile of workers shows that SBSR Sector is a male-dominated industry. Out of 2,660 recorded SBSR workers, only a very negligible percentage is shared by female (8%).

**Age**

- Most of the workers are young adult, between the ages of 21-30 years old (40%) who are in the administrative (6%), design/engineering (4%) and heavy equipment operation (7%) categories.

**Nationality**

- Majority also of the workforce are Filipino nationals (97%).

**Education**

- Most of the SBSR workers are graduates of technical vocational courses (26%) occupying positions in the work preparation/production (skilled/semi-skilled workers) (88%) and heavy equipment operation (11%).
- For college graduates (18%), on the other hand, most are in categories of managers (32%), designers/engineers (25%), and administrative personnel (23%).
  - ✓ For workers who are graduates of maritime courses – BSMT (9%) and BSMarE (11%) they are in the work preparation/production (skilled/semi-skilled workers) category (24%).
  - ✓ One-third of the workers (33%) are graduates of engineering courses, such as mechanical (15%), electrical (9%), environmental (4%), and civil (4%) occupied mostly by Managers (11%) and Administrative Personnel and Work Preparation/Production Workers (8%) respectively.
  - ✓ Graduates of NAME (13%) and architecture (2%) are Designers/Engineers (40%) and Managers (38%).

- ✓ Graduates of Other Course (31%) are workers who are in the work preparation/production (skilled/semi-skilled workers) (57%) and administrative (23%) categories.

### License

- Professional licenses of workers are as follows:
  - Workers' with merchant marine licenses are in the Work Preparation/Production category
  - Licensed engineers (33%) are workers in the Managerial positions (26%)
  - Licensed NAME and architect (26%) are in Design/Engineering (51%) positions

### Common Positions of Workers

- As observed, SBSR companies followed hierarchy of position and delegation of responsibilities such as managers, technical, support services, skilled and production staff.

Managers	General manager (16%)
	Shipyard superintendent (13%)
	Dockmaster (11%)
	Finance manager (8%)
	Personnel manager (8%)
Administrative Personnel	Admin staff (Front Liner, IT, Cashier, Clerk, General Services) (51%)
Design/ Engineers	Naval architect and marine engineer (21%)
	Draughtsman (CAD) (15%)
	Mechanical engineer (12%)
Work Preparation/ Production (skilled/semi-skilled workers)	Welder (12%)
	Carpenter (7%)
	Pipe fitter (6%)
	Spotter (6%)
Heavy Equipment Operators	Truck operators (33%)
	Crane operator (31%)
	Fork lift operator (17%)
	Heavy lift operator (16%)

### Salary

- Highest paid workers are those holding managerial positions and followed by the designers/engineers. The low-paid workers are in the work preparation/production category and the heavy equipment operators.

Category	Salary Range
Managers	P21,000 - 25,999
Designers/Engineers	P16,000 - 20,999
Administrative Personnel	P11,000 - 15,999
Work Preparation/ Production	P10,000.00 - below
Heavy Equipment Operators	P10,000.00 - below

Skills Competency Level

- The data on skills competency level of SBSR workers was taken from the survey conducted by MARINA in 2012.
  - ✓ Most of the SBSR workers rated **Average** in the three areas of trade skills - Electric Arc Welding, Electrical Skills and Boatbuilding.
  - ✓ Most workers rated **Good** for their trade skills in Ship Fitting and Sheet Metal Works.

Trainings Attended

- SBSR workers have attended company-required trainings according to 30 SBSR companies. The most common trainings attended by workers are as follows:

Category	Maritime-related trainings	Non-maritime related trainings
Managers	Basic Safety Training	Personnel Management
	Medical Emergency First Aid	Financial Management
	Ship Planning and Design	Pollution Control
	Advanced Training in Fire Fighting	Occupational Safety and Health Practices
	Shipyards Environment Pollution Control	Customer Service
Administrative Personnel	Medical Emergency First Aid	Personality and Value Orientation
	Basic Safety Training	Financial Management
	Advanced Training in Fire Fighting	Personnel Management
	Prevention of Alcohol and Drug Abuse in the Maritime Sector (PADAMS)	Occupational Safety and Health Practices
	STD/HIV Prevention in the Maritime Sector	Customer Service
Designers/Engineers	Ship Planning and Design	Erection Fabrication
	Basic Safety Training	Engineering Plans, Calculations and Specifications
	Shipbuilding and Ship Repair training	Fiber Glass training
	Ship's Hull Maintenance (Derusting & Painting)	Electronic
	Medical Emergency First Aid	Occupational Safety and Health Practices, and Pollution Control.
Work Preparation/Production (Skilled/ semi-skilled workers)	Basic Safety Training	ARC Welding
	Advanced Training in Fire Fighting	Automotive Mechanic
	Medical Emergency First Aid	Gas cutting
	Drydocking Shipyards Diver's Course	Shielded Metal Arc Welding (SMAW) NC I
	Ship Planning and Design	Shielded Metal Arc Welding (SMAW) NC II
Heavy Equipment Operator	Advanced Training in Fire Fighting	Crane Scissor Loft,
	Basic Safety Training	ARC Welding
	Medical Emergency First Aid	Heavy Equipment Basic Maintenance Work
	Maritime Security Awareness	Gas Tungsten Arc Welding (GTAW) NC II
	Prevention of Alcohol & Drug Abuse in the Maritime Sector (PADAMS)	Automotive Mechanic

## 2. Preferred Qualification Requirements of Employers in SBSR Sector

Responses of company representatives on their preferred qualification requirements in hiring workers for their companies are as follows:

### Sex

- Preference to hire male workers for Heavy Equipment Operators (75%), Managers (65%), Work Preparation/Production Workers (59%), and Designers/Engineers (48%)

### Age

- Generally, the age preference of employers is between 31-35 years old (38%)
- For specific age category, their preference age is as follows:
  - ✓ 31-35 years old – for Managers (43%), Administrative Personnel (33%) and Designers/Engineers (43%)
  - ✓ 26-30 years old - for Work Preparation/Production (skilled/semi-skilled workers) (33%) and heavy equipment operators (36%)

### Education

- Preference for college graduate-workers for the following position categories:
  - ✓ Managers (80%)
  - ✓ Administrative Personnel (75%)
  - ✓ Designers/Engineers (77%)
- Preference for Technical-Vocational graduates for:
  - ✓ Work Preparation/Production Workers (51%)
  - ✓ Heavy Equipment Operators (48%)

### Licenses

- Most companies do not require licenses in hiring workers.
- For companies that require license, preferred license are as follows:
  - ✓ Mechanical engineer – for Managers (42%), Designers/engineers (36%)
  - ✓ NAME – for Managers (30%), Designers/engineers (19%)
  - ✓ Electrical engineer – for Work Preparation/Production (25%)
  - ✓ Accountant – for Administrative Personnel (19%)

### Work Experience

- Majority of the companies require work experience of workers in land-based employment or SBSR employment within the country.
- Some companies require workers with shipboard experience specifically for manager's position.

Skills Requirement

- Listed below (by category) are the most identified skill requirement of employers in hiring workers:
  - ✓ Managers
    - Project management (site supervision and inspections)
    - Personnel management
    - Project planning
    - Financial management
  - ✓ Administrative Personnel
    - Clerical works
    - IT literacy/Marine Software Operation
    - Cashiering
  - ✓ Designers/Engineers
    - Ship planning and design
    - Ship's construction and structural design
    - Shipbuilding
    - Engineering design and calculations
    - Detailing and drafting
  - ✓ Work Production/Preparation (skilled/semi-skilled workers)
    - Welding/specialized welding
    - Ship fitting
    - Electric arc welding
    - Pipe fitting
    - Electrical skills
  - ✓ Heavy Equipment Operation
    - Crane operation
    - Heavy lift/equipment operation
    - Truck operation
    - Automotive
    - Cargo winch operation

Training Requirements

- SBSR companies responded that they will require their workers to attend non-maritime related trainings (47) and maritime-related trainings (37). Maritime-related trainings are trainings that are applicable for workers assigned on vessels and at shipyards.
- Most identified required trainings by employers are as follows:

Category	Maritime-related training requirements	Non-maritime related Trainings
Managers	Basic Safety Training	Personnel Management
	Ship Planning and Design	Occupational Safety and Health Practices

	Shipyards Environment Pollution Control	Pollution control
	Shipbuilding and Ship Repair Training	Financial Management
	Shipyards Planned Maintenance System	Project Management training
Administrative Personnel	Medical Emergency First Aid	Occupational Safety and Health Practices
	Basic Safety Training	Customer Service,
	Shipyards Crisis Management	Personality and Value Orientation
	Shipyards Environment Pollution Control	Personnel Management
	Shipyards Risk Assessment	IT training/ Marine Software Operations
Designers/Engineers	Ship Planning and Design	Engineering Plans, Calculations & Specifications
	Medical Emergency First Aid	Machinery Installation
	Basic Safety Training	Occupational Safety and Health Practices
	Shipbuilding and Ship Repair Training	Erection Fabrication
	Shipyards Environment Pollution Control	Mold-lofting
Work Preparation/ Production Workers	Advanced Training in Fire Fighting	ARC welding
	Basic Safety Training	Gas Metal Arc Welding (GMAW) NC II,
	Drydocking Shipyards Diver's Course	Mechanical/Machine Works
	Ship Planning and Design	Gas Cutting
	Ship Fitting	Metal Sheet Works
Heavy Equipment Operators	Advanced Training in Fire Fighting	Heavy Equipment Basic Maintenance Work
	Basic Safety Training	Cargo Winch Operation
	Ship's Machinery Repair	Automotive Mechanic
	Medical First Aid	Crane Scissor Loft
	Shipyards Environment Pollution Control	Occupational Safety and Health Practices

### 3. Skills Assessment and Training Needs

To assess skills gaps and training needs, the study draws on the data from what is available from workers and what is required by employers, in terms of education, training and skills of workers.

- No gap in terms of education is noted.

Category	Education	
	Profile of Workers	Requirements of Employers
Managers	College degree	College degree
Administrative Personnel	College degree	College degree
Designers/Engineers	College degree	College degree
Work Preparation/Production Workers	Tech-Voc	Tech-Voc
Heavy Equipment Operators	Tech-Voc	Tech-Voc



- In terms of maritime-related training requirements of employers for workers in the SBSR sector indicates that maritime-related trainings required by employers are found in the workers' training profile. But, employers have other training requirements which are not found in the workers' profile indicating a training gap. Workers do not possess other training requirements of employers.

Position Category	Maritime-Related Trainings Attended	Maritime-Related Training Required
Managers	Basic Safety Training	Ship Planning and Design Shipyard Environment Pollution Control
Administrative Personnel	Medical Emergency First Aid	Medical Emergency First Aid
Designer/ Engineers	Ship Planning and Design	Ship Planning and Design
Work Preparation/ Production	Advanced Training in Fire Fighting	Advanced Training in Fire Fighting
Heavy Equipment Operator	Basic Safety Training	Advanced Training in Fire Fighting

Position Category	Non Maritime-Related Trainings Attended	Non Maritime-Related Training Required
Managers	Personnel Management	Personnel Management
Administrative Personnel	Personality and Value Orientation	Occupational Safety and Health Practices Customer Service
Designer/ Engineers	Erection Fabrication	Engineering Plans, Calculations and Specifications
Work Preparation/ Production	ARC Welding	ARC Welding
Heavy Equipment Operator	Automotive Mechanic	Heavy equipment basic maintenance work

- On skills, results show the following:
  - Available skills of workers are that of boat design building and repair/boat building. However, employers prefer their workers to have skills on ship planning and design, shipbuilding
  - Workers have limited skills whereas employers require them (by occupational category) to have specific skills

Occupation Category	Employers' Skills Requirement	Workers' Skills	Competency Level in Trade Areas	
Managers	Project management(site supervision and inspections)			
	Personnel management			
	Project planning			
	Financial management			
Administrative Personnel	Clerical works			
	IT literacy/Marine Software Operator			
	Cashiering			
Designer/ Engineers	Ship Planning and Design	Boat design building and repair (fishing)	Good	
	Ship's Construction & Structural design			
	Shipbuilding	Boatbuilding	Average	
	Engineering design and calculations			
	Detailing and drafting			
Work Preparation/ Production (Skilled/ Semi-skilled workers)	Welding/ specialized welding			
	Ship fitting	Ship Fitting Skills	Good	
	Electric Arc Welding	Electric Arc Welding	Average	
	Pipe fitting			
	Electrical skills	Electrical Skills	Average	
	Skilled Drydock Diver			
	Ship's Carpentry Works			
	Sheet metal works	Sheet Metal Works	Good	
	Painting works – airless paint sprayers	<u>Others:</u> Ability to inspect blasting works and painting works		Good
		Ability to conduct Ultra Sonic Testing		
Propulsion works				
Heavy Equipment Operators	Crane Operation			
	Heavy lift/equipment operation			
	Truck operation			
	Automotive			
	Cargo Winch Operation			

Overall, workers in the SBSR sector fall short in terms of trainings and skills requirements.

**RECOMMENDATIONS:**

The recommendations generated from the study are as follows:

- Given the record of the Philippines as the 4th shipbuilding nation, continual skills enhancement is needed and at the same time there is a need to have a system of certification for the workers;
- Establish minimum maritime safety-related trainings and occupational safety-related trainings for workers assigned on vessels and at shipyards;
- Require SBSR workers to undergo job-specific trainings;
- Establish a national certification system for the issuance of Certificate of Competency (COC) for SBSR workers;
- Monitor the supply and demand of workers in the SBSR Sector.

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*/19 feb 2016*