

## **Career Identification of Production Operators' Position in Manufacture Industries**

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**Abstract.** Graduating of Vocational High School in the manufacturing industry occupies job of production position. The demands of industrial needs are in the manufacturing sector. They want employees or labor that have told and professional competencies. Therefore, it is necessary to analyze and identify career in operator position. This study uses qualitative research. This research focuses on analysis of operator's position needs in the industry. Based on the results of the research, the work of production operators includes briefing, setting, operating, quality procedures, and engine maintenance. There are several competencies regarding the position of production operators, namely occupational health and safety, quality assurance, measuring instruments, hand tools, technical drawings, general machining, and special conditions. Production operators get salaries, which include grade-based salaries, and salary holidays. Susceptible salary obtained by production operator position gets a vulnerable salary based on the industrial area district minimum wage where he works.

**Keywords:** *Competence, A Needs Industry Manufacture, VHS Graduates*

### **INTRODUCTION**

Vocational High School (VHS) graduates in the manufacturing industry which occupies to work as production personnel including production operators, helpers, QC, technicians, transportation equipment, and manual workers (Khurniawan & Erda, 2019). Therefore, we can be concluded that the work of Production Operators in Industry requires Vocational High School graduation. Vocational High School graduations are which people graduates and they must be able to have the ability to work in certain fields of work (Dardiri, 2012). Vocational High School graduation are students who have completed education and are equipped with skills in certain jobs (Perkins, 1998).

The manufacturing industry requires employees or labor to have standardized and professional competencies (BNSP, 2017). The planning of labors to terms of a need is a derived. it needs for new labor will be exist, if there is a demand for goods and services are produced by the community (Maryanti, 2012). The main objective of identifying and analyzing industrial competence are to verify whether a workforce has the knowledge, attitudes, and skills are needed in the Business World and Industrial World (Shyr, 2012). Furthermore, Barrick (2019) states that skill competency is the key in adapting to a dynamic and evolving job.

Skills are a form of competence that has been inherent in the labor. Furthermore, competency is an individual personality characteristic related to superior performance and motivation (Winterton et al., 2006). Darmawang (2017) argues that competence is a combination of skills, self-attributes, and behaviors which is related to one's performance and success at work. Therefore, it can conclude that competence is an individual skill, experience, knowledge, personal value, motivation, and individual personality that are used on a field of work to get the right performance.

According to the general opinion of a job, it needs for competency groups; it aims to maximize the competencies possessed by human resources (McGrath, 2020). Therefore, the labor market is allowed to determine standard needs (human resources) according to their respective that needs (Bonvin, 2019). With this, this research focuses on the Identification of Production Operator Careers in Industry, which focuses on the job scope of operator positions, required competencies, career paths,

incentives, and salary standards. The industry can select which is based on COE of Vocational High School's partner industry in East Java, with the category of manufacturing industry.

## METHODS

The research method is used a case study. Data collection techniques use interviews, documentation, and observation. Then it is written using a code, (F1-a / HRDInstas-W / 8-1-2020), which is used to transcribe the findings data. The location of this research is PT. Insastama Kediri, PT. Pal Indonesia Surabaya, and PT. Arthawena Sakti Gemilang Malang the source of research is Human Resource Department, Production Operators, Technicians, and Heads of Divisions. At the end of the research methodology, the data were analyzed using triangulation of sources and data, and then this can conclude and discuss together.

## RESULTS AND DISCUSSIONS

PT. Insastama Kediri is located on Jl. Gadungan Satak No.7, Puncu, Kediri, and East Java, which is a manufacturing industry that is engaged in manufacturing nuts, bolts, nails, and metal. PT. PAL Indonesia Surabaya is located at the Edge of Surabaya, East Java 60155, it is one of the strategic manufacturing industries that produces the main equipment of the Indonesian defense system, especially for the marine dimension. PT. Arthawena Sakti Gemilang Malang is located Jl. Raya Kertanegara No.85, Ngambon, Girimoyo, Kec. Karang Ploso, Malang, it is a manufacturing industry in the field of manufacturing food cans, paints, etc. Generally, career identification of production can be seen in Figure 1.

### Job of Production Operator

Production Operators do the first job with a briefing such as (1) the implementation of Occupational Health and Safety (OHS) during they work, (2) division of work tasks, and (3) description of the achievement of targets that must be achieved. The scope of work is described in Table 1.

Table 1. Scope Production Operator Job Position

| No. | Competence   | Information  |
|-----|--|--|
| 1.  | Setting up production machines and production raw materials  | <ul style="list-style-type: none"> <li>- Turn on the production machine.</li> <li>- Check material specifications.</li> <li>- Set raw materials on the machine</li> </ul>  |
| 2.  | Carry out operation and supervision of production machines   | <ul style="list-style-type: none"> <li>- Operate of production machines using a control system.</li> <li>- Supervise the production process.</li> <li>- Perform engine problem analysis.</li> </ul>  |
| 3.  | Carry out mass production quality procedures by Production Operators and together with the QC (Quality Control) team | <ul style="list-style-type: none"> <li>- Customize mass production results and product specifications.</li> <li>- Use a gauge or mall.</li> <li>- Use calipers (analog and manual)</li> <li>- Use the quality procedure checklist</li> </ul> |
| 4.  | Perform maintenance on production machines   | <ul style="list-style-type: none"> <li>- Clean Production machine</li> <li>- Lubricate production machines.</li> <li>- Fill the production machine maintenance card.</li> <li>- Applicant industrial 5Rs</li> </ul>                          |

The fourth industrial innovation and development currently has an impact on changes in products, services and production systems, this has an impact on the career of a worker in the manufacturing industry (Kipper et al., 2021). Khurniawan & Erda (2019) state that Vocational High School (SMK) graduates in the manufacturing industry who occupy jobs with production personnel positions include production operators, helper, QC, technicians, transportation equipment, and manual workers. In a job

that will start with a briefing activity, according to Prodea et al., (2019) that morning briefing work can affect the motivation of the production operator workforce, the briefing includes: an explanation of the process of achieving goals and work productivity which impacts on a performance in the industry.

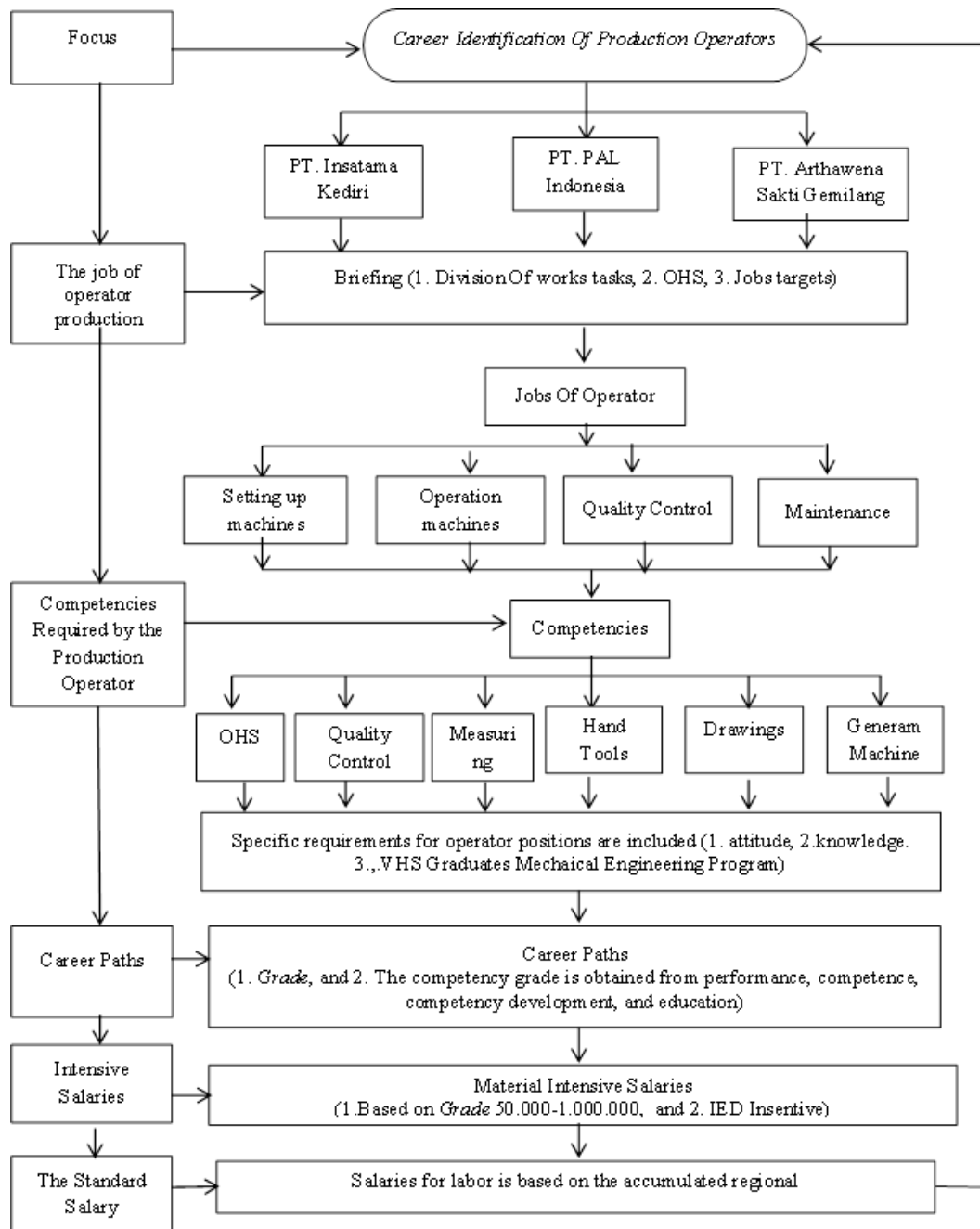


Figure 1. Chart of Production Operator Position in Industry

Production Operators begin with a 10-minute briefing which is attended by all Production Operators and is conveyed by the head of the division regarding, (1) dividing the tasks to be carried out, (2) achieving targets that must be completed, and (3) awareness of the application of industrial Occupational Health and Safety culture. Furthermore, a Production Operator checks the machine, this is done with the aim that the machine is ready for use in the mass production process, if there is a machine trouble shoot a Production Operator analyzes the machine failure and reports it by a technician.

Sugiarto and Sutapa (2017) confirm this, which states that the work of production operators in the PT. XYZ automotive operates production machines and checks production results.

### Competencies Required by the Production Operator Position

There are several competencies that are needed in the manufacturing industry. This is based on an analysis of the scope and flow of production carried out by the workforce. The competencies that must be in the position of Production Operator that is described in Table 2.

Table 2. Competence of Production Operators

| No. | Competence                     | Information  |
|-----|--------------------------------|--|
| 1.  | Occupational Health and Safety | <ul style="list-style-type: none"> <li>- Focus an attitude and awareness of the dangers of Occupational Health and Safety</li> <li>- Use PPE (safety shoes, safety helmets, wear packs, gloves, and masks)</li> <li>- Applicant of 5R in industry (Compact, Neat, Clean, Careful, and Diligent)</li> </ul>   |
| 2.  | Quality Control                | <ul style="list-style-type: none"> <li>- Perform quality procedures based on technical drawings and SOPs</li> <li>- Carry out quality procedures together with the head of the workshop</li> <li>- Carry out quality procedures together with QC (Quality Control)</li> </ul>  |
| 3.  | Measuring instrument           | <ul style="list-style-type: none"> <li>- Use of analog calipers and manuals</li> <li>- Use of micrometer outside diameter, inside diameter, and depth</li> <li>- Use a metric thread comb and whiteout</li> </ul>  |
| 4.  | Hand Tools                     | <ul style="list-style-type: none"> <li>- Use an instrument file</li> </ul>   |
| 5.  | Engineering drawings           | <ul style="list-style-type: none"> <li>- Under stand of the reading of technical drawings (measuring indicators, tolerances, drawing lines, shapes, information on the work of the N1-N12 image, and sections)</li> <li>- Analyze technical drawings and SOPs as a guide for work</li> </ul>   |
| 6.  | General Machining              | <ul style="list-style-type: none"> <li>- Knowledge of production machinery (lathe, milling, grinding, CNC, and welding) as the basis for operating production machines</li> </ul>  |
| 7.  | Special Terms                  | <ul style="list-style-type: none"> <li>- Have a good attitude at work (discipline, enthusiasm, and agility)</li> <li>- Have work experience in the form of Industrial Work Practices or industrial apprenticeships and are proven by a certificate of experience</li> <li>- be Smart (mastery in knowledge and skills in the Department of Mechanical Engineering)</li> <li>- majoring in Mechanical Engineering of graduating vocational high school</li> </ul> |

The era of globalization in the 21<sup>st</sup> century in the manufacturing industry sector is experiencing a very fast development. The era led to a surge in new competencies, which are applied in the manufacturing industry sector (DiBenedetto, 2018). Competence is the state of being able or the ability to perform effective (feasible), sustainable (solving problems, realizing innovation, and creating change), organizing, and carrying out tasks (Mulder, 2016). Furthermore, the meaning of competence is a person's ability to use aspects of knowledge (cognitive), attitudes (affective), and skills (psychomotor) in a particular job (Labarre, 2010).

According to Jilcha Sileyew (2020) OHS competence is one of the competencies that attracts attention in the manufacturing, construction, service, agribusiness, and culture industries. The automotive manufacturing industry implements Occupational Health and Safety, which includes, use of PPE, following Occupational Health and Safety procedures, and prevention of Occupational Health and Safety hazards (Setyabudhi, 2020). Furthermore, it was emphasized by Afif (2019) regarding K3 at PT Garuda Top Plasindo, he said that the work environment affects the work productivity of production operators, Occupational Health, and Safety on the work productivity of production operators. This is the same as the results of research that is conducted at PT. Insastama Kediri; PT. Pal Indonesia Surabaya, and PT. Arthawena Sakti Gemilang Malang. The competencies are needed in the position of operator, regarding Occupational Health and Safety competencies include: (1) focus attitude

and awareness of the dangers of Occupational Health and Safety; (2) using PPE (safety shoes, safety helmets, wear packs, gloves, and masks); and (3) application of the 5Rs (Brief, Neat, Clean, Careful, and Diligent).

Setyabudhi (2020) states that the competence of the manufacturing industry use and maintenance of measuring instruments (pressure type, multi meter, and calipers) which are used at work. This is the same as the results of research in the industry regarding the competence of measuring instruments including the use of calipers, micrometers and screw combs. Then, according to Saputro & Sudibyo (2013) that the competence of Production Operators regarding measuring instruments in the position of Production Operators, measuring using precision mechanical measuring instruments, pneumatic measuring instruments, and maintaining measuring instruments.

Sugiarto & Sutapa (2017) stated that the production operator in the industry PT. In addition to operating production machines, XYZ automotive, they also carry out production quality assurance or check production results, they do it for getting products that comply with predetermined standards. This is the same as the results of research conducted in Industry that the competence of quality procedures carried out by includes; (1) quality procedures based on technical drawings and SOP), (2) conducting quality procedures together with the head of the workshop, and (3) carrying out quality procedures together with QC (Quality Control). Saputro & Sudibyo (2013) states that in the competence of production operators using hand tools, the most important of which is to use various kinds of hand tools and powered hand tools. Furthermore, in line with the results of the study shows that Production Operators use instrument files on Production Operators hand tool competence

Technical drawing is a communication tool for machine tool work, and then the job uses technical drawings that are very relevant to the needs of the manufacturing industry in Central Java (Arifin & Ristadi, 2017). Saputro & Sudibyo (2013) states that the competence of production operators regarding Mechanical Engineering Drawings includes interpreting sketches and being able to make hand sketches, describe drawings, and understand symbols of work. The results of research which was carried out in industry with the position of Production Operator in the technical drawing competency include: (1) understanding of the reading of technical drawings (measuring indicators, tolerances, drawing lines, shapes, job descriptions of N1-N12 drawings, and cross-sections); and (2) analyzing and then reading technical drawings and SOPs as a guide for work.

General machining competence (turning, drilling, and sensing) is in the manufacturing industry 4.0. It is used as a support process or support for the production process (Kim et al., 2018). The results are the same as the results of research in industry that general machining competence in production machining knowledge (lathe, milling, grinding, CNC, and welding) as the basis for operating production machines.

Specific requirements for operator positions are included: (1) they have attitude in work (discipline, enthusiasm, and agility), they have work experience in the form of Industrial Work Practice or industrial apprenticeship and is proven by a certificate of experience, (2) they are smart (mastery of knowledge and skills in the Department of Mechanical Engineering), and (3) they graduate from the Vocational High School majoring in Mechanical Engineering.

According to Oswald-Egg & Renold (2021) emphasized that in addition to considering the competence of the workforce, work experience while studying at Vocational High Schools is a consideration in entering the manufacturing industry. Robles (2012) emphasizes that the specific requirements of the workforce are 21<sup>st</sup> century competencies, which is included: (1) soft skills relates to personal and interpersonal skills; whereas (2) hard skills relates to technical knowledge or expertise. Soland et al., (2013) argued that 21<sup>st</sup> century competencies include: (1) critical thinking, (2) collaboration, (3) communication, (4) leadership, (5) motivation, (6) creativity, (7) learning throughout life, and (8) independent.

### Career Paths Undertaken by the Production Operator

A worker must go through stages to form an appreciation of competence. Production Operator career path of vocational high school graduates ranks at the bottom, when compared to others. In a career ladder, there is a grade or level of assessment contained in the competency report cards, this is used as a reference for advancing the career ladder thereafter. Grading is based on competence or mastery of production machines at work. Vocational high school graduates must start from career level 7 as potential workers with industrial apprenticeship status for approximately 3 to 6 months (Figure 2). Furthermore, prospective workers work in the 6th career with the position of operator, which is continued up to career ladder 3. Technicians use the consideration of competency report cards according to competency grade. The competency grade is obtained from performance, competence, competency development, and education that are described in Figure 3.



Figure 2. Career Paths in Industry

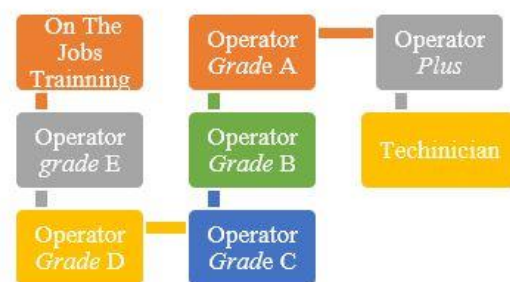


Figure 3. Career Paths in Production Operators

Susilo et al. (2018) stated that the Indonesian National Qualifications Framework (KKNI) is a competency gap that equates and integrates formal, non-formal, and informal education in the framework of recognizing work competencies. Furthermore, the KKNI level which functions in mapping the career ladder of a workforce (Farkhan, 2020). A career path can be defined as a series of positions that each individual employee must pass in reaching a certain position level (Questibrilia, 2019). Barrick (2019) states that competency in vocational high school graduates refers to the vocational field they take, the career path of the worker, and the workplace. From the results of research on career ladder in industry, that vocational high school graduates occupy the career ladder in the position of production operator. Vocational high school graduates first get a career path are Production Operators (Farkhan, 2020).

### Operators Earn Intensive Salaries

Intensive salary is a form of appreciation which is given by workers, in order to spur enthusiasm at work. Production operators get incentive salaries based on the class and level of a worker's career path. The form of incentive salary obtained: (1) in the form of additional salary bonus, this is different from the base salary which is given. Production Operators get dynamic incentive salaries, based on the grade on the competency report cards they receive. The range of incentives earned by a Production Operator is around 50,000-1,000,000; and (2) holiday (IED) incentives, in which these incentives are obtained by workers in the position of Operators at the rate of one base salary.

Incentive salaries are a form of appreciation given to workers for their achievements. According to Vaisburd et al., (2016) that incentive salaries are in the form of additional salaries provided by workers with the aim of encouraging workers to work more effectively from the work and responsibilities that have been done. Salary Incentives for labor are based on a competency assessment in the form of a work force ranking table, where each position rank corresponds to the salary level (Plenkina & Osinovskaya, 2018). The results of research in industries related to operator job incentives

are obtained; (1) additional salary bonus, which is different from the basic salary given. The incentives obtained by Production Operators are dynamic, with class references on the competency report cards they obtain. A Production Operator gets an incentive salary of around 50,000-1,000,000; and (2) holiday incentives, with this incentive there is a workforce of operator positions at the rate of one base salary.

### **The Standard Salary Which is Obtained in the Operator Position**

According to Vaisburd et al., (2016) states that the increase in rates or salaries for labor is based on the accumulated regional income reported, in other words, the district minimum wage earned by workers in each region varies. This is in accordance with the results of research conducted in Industry; industrial production operators, adjusting where the industry is located, obtain the salary. PT. Insatama Kediri has a vulnerability of 1,800,000 to 2,500,000, at PT. PAL Indonesia Surabaya of 3,900,000 to 4,500,000, and PT. Artawena Sakti Gemilang of 2,500,000 to 3,500,000.

### **CONCLUSION**

Based on the research focus, data exposure, and discussion, the results of the research can be concluded, regarding the work of Production Operators in the industry which begins with a briefing activity. Furthermore, a production operator performs the following tasks: (1) setting up production machines and production raw materials, (2) operating production machines, (3) carrying out mass production quality procedures by Production Operators and together with the QC (Quality Control) team, and (4) perform maintenance on production machines.

There are several competencies in the work of production operators, which are regarding, occupational health and safety, quality assurance, measuring tools, hand tools, technical drawings, general machining and special requirements. The competency is based on a job analysis and needs in the Production Operator position in industries. Incentive salary which is obtained based on grade at career path, and holiday incentive salary. Furthermore, the position of Production operator is obtained by graduates of vocational high schools to enter the industrial world. Then, the vulnerable salary, which is obtained by the position of Production Operator, is above the minimum wage in the district where the industry is located.

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