

## CHAPTER VI

### CONCLUSION AND SUGESSTION

#### 6.1 Conclusion

Based on the research results, several conclusions refer to the problem formulation can be concluded as follows:

1. There are 43 machine defects that occurred for 28 months from January 2016 until April 2018. Based on Apollo root cause analysis there are 12 problems which are flywheel seal leaked, dies height pin is broken, worn teeth of dies height, axle bearing of flywheel is broken, seal and air tube leaked, sill break leaked, oil tube leaked, broken dies head, machine overload, dies head screw slacked, cylindrical axle bended, and sill, break, and screw holder leaked. The root causes are found from the analysis consists of 5 root causes which are aging, no routine maintenance, over tonnage, operator error, and overuse.
2. Based on Apollo root cause analysis which has identified five major causes as the root causes of 12 problems occurred, there are four possible solutions to mitigate the future occurrence of machine defect. Those are creating routine maintenance schedule to mitigate aging and no routine maintenance, conducting material studies to mitigate over tonnage, creating good and safe working environment to maintain operator focus to mitigate operator error, and the last is lowering tonnage capacity to mitigate overuse.
3. The ARIMA defect forecasting is performed without and with the influence of risk controls. The forecasting itself is being done using 12 months lead time. The result shows that the forecasting without the influence of risk control has 2 defect occurrences for each forecasted month. In the other hand, the result of forecasting

with the influence of risk control has 1 defect occurrences for each forecasted month.

4. The effectiveness of risk control is calculated using defect prevention effectiveness. The scoring for DPE is obtained from literature review due to the condition where no previous study conducted related to machine defect so, PT. Yoska Prima Inti did not have the historical DPE value. The DPE used is 75% and 85% for manufacturing company, where the defect before mitigation analysis resulted in the value of maximum possible defect is 3 until 4 defects, 75% DPE is 1 defect, and 85% DPE is 0 defect. On the other hand, the defect after mitigation analysis resulted in the value of maximum possible defect is 1 until two defects, 75% DPE is 0 defect, and 85% DPE is 0 defect. The value of the defect itself is in monthly occurrence.

## 6.2 Suggestion

Some recommendations from the research is suggested as follows:

1. PT. Yoska Prima Inti should be aware and pay more attention to each machine defect occurred by doing several preventive actions, such as:
  - a. Creating routine maintenance schedule for the production machine.
  - b. Conducting material studies before contracting and before production.
  - c. Creating good and safe working environment to maintain operator focus by reassessing the health and safety requirement and implementation at the company.
  - d. Lower machine tonnage capacity by maximum is 20% for 300T stamping machine stated by AIDA (2008).
2. The preventive actions and machine defect analysis for PT. Yoska Prima Inti can be used to be implemented at another manufacturing company which has the same defect background. Hence, the other company can be aware of the benefit in conducting defect or failure researches for future development of the company.
3. For future research, conducting seasonal machine defect research might help the company to evaluate the defect that might be happened in the future deeper and through.

4. For future research, conducting research related with the machine defect and human resources can be very beneficial for manufacturing company. It can give optimized production capability and capacity in terms of the production maintenance sector.