

# How To Be an Excellent Team ? Total Productive Maintenance Case Study In Cemen Manufacturing

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## ABSTRACT

PT Solusi Bangun Indonesia was assigned a Total Productive Maintenance (TPM) activity by the Indonesia cement holding group (PT Semen Indonesia Group) to support the company's vision to become a leading provider of building materials in the region. With the aim of sharing best practices in factory operations, utilizing sustainable practices, transforming into an integrated performance-driven culture, conducting a wave of improvement in the industrial era 4.0 so as to increase the Overall Equipment Effectiveness of each factory through small group activities in total productive activities. maintenance. This will be achieved if there is an excellent team which is marked by the innovation produced by the team. The research problem is why innovation only appears in certain teams even though the whole team has received the same training and assistance and the same assessment is carried out in each quarterly routine assessment in the TPM award event with the management level being actively involved and supporting and coaching several SGA (small group activity) teams that became task force. The research was conducted using the case study method, where the researcher entered the research object, the researcher focused on observing, describing, interpreting and analyzing. As well as conducting in-depth interviews through semistructured multilevel questions at the Cilacap Plant, conducting focus group discussions, analyzing data from documents and archives. Triangulate data through data archives for assessment of TPM activities and innovation champions to produce pattern recognition formulas that can be replicated in all other teams. Found obstacles that hinder the emergence of innovation and how innovation is raised in a team becomes the object of this research. So that it is found that pattern recognition to become an excellent team requires a combination of a creative process that is supported by a psychologically safe environment and produced by people who have the characteristics of "high need for autonomy, highly motivated integrated regulation, altruism, organizational citizenship behavior, and affectiveness. work commitment. An additional factor that helps make it easier for a team to become an innovation champion is maximizing momentum

**Keywords:** Total Productive Maintenance, Creative Process, Personal characteristics, Climate Team.

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## 1. Introduction

PT Solusi Bangun Indonesia Tbk (ex PT Holcim Indonesia Tbk) was acquired and became part of the cement Holding in PT Semen Indonesia group since 2019. So that the 4 factories that

operational for PT Solusi Bangun Indonesia Tbk are the Lhoknga (Aceh) factory, the Narogong factory (Bogor), Cilacap Plant, and Tuban Plant which have a production capacity of 14.5 million tons of cement per year joined opco (operating company) or a subsidiary of PT Semen Indonesia group, namely PT Semen Padang, PT Semen Tonasa, PT Semen Gresik, Thang Long Cement (Vietnam) so that the total production capacity is 51 million tons of cement per year. This makes PT Semen Indonesia Group the largest cement producer in the Southeast Asia region and number 10 in the Asian region. In accordance with the 2024 vision for PT Semen Indonesia Group, which is to become a leading provider of building materials in the regional area, it is mandatory (obligation) to implement Total Productive Maintenance (TPM) activities in all subsidiaries. With the aim of sharing best practices in factory operations, utilizing sustainable practices, transforming into an integrated performance-driven culture, conducting a wave of improvement in the industrial era 4.0 so as to increase the Overall Equipment Effectiveness of each factory through small group activities in total productive activities. maintenance. This will be achieved if the formation of an excellent team is marked by the innovation produced by the team. Total productive maintenance as a momentum to explore and develop innovation. Innovation is the main parameter in the assessment and this innovation can be included in the corporate level innovation championship and the SIGGIA Innovation award at the holding level which is held annually. The research problem is why innovation only appears in certain teams even though the entire team has received the same training and assistance and the same assessment is carried out in each quarterly routine assessment in the TPM award event with management level being actively involved and supporting and coaching several SGA (small group activity) teams. who became the task force. The research was conducted using the case study method, where the researcher entered the research object, the researcher focused on observing, describing, interpreting and analyzing. As well as conducting in-depth interviews through semi-structured multilevel questions at the Cilacap plant, conducting focus group discussions, analyzing data from documents and archives. Triangulate data through data archives for assessment of TPM activities and innovation champions to produce pattern recognition formulas that can be replicated in all other teams. Found obstacles that hinder the emergence of innovation and how innovation is raised in a team becomes the object of this research.

## **2. Literature Review**

### *2.1 Total Productive Maintenance*

Companies that implement total productive maintenance experience an increase in business performance in the field of manufacturing and services (Brah&Chong., 2004), while according to Chan et al, (2005) total productive maintenance is a method to increase the availability of existing equipment thereby reducing the need for investment capital. . Referring to McKone et al., (2001) Total productive maintenance (TPM) has a positive relationship with lower costs (measured by higher inventory turnover), higher quality, levels higher (measured by a higher level of conformance to specifications), a stronger delivery rate (measured by a higher percentage of on-time delivery and higher delivery speed, while Bamber et al., 1999). One approach to Improving the performance of maintenance activities is to implement and develop a total productive maintenance (TPM) strategy. The Total productive maintenance (TPM) strategy contributes to an organization's manufacturing competence (Ahuja & Khamba.,2008).Continuing previous research, TPM has been envisioned as an effective tool in an effort to achieve world-class status and meet increasing competition (Ahuja et al., 2006).TPM (Total productive maintenance)

practices have a significant impact on factory performance levels (Modgil, & Sharma, 2016). According to Wang (2006) Total Productive Maintenance (TPM) has been widely recognized as a strategic weapon to improve manufacturing performance upset. According to Nallusamy.(2016). TPM aims to increase engine efficiency and productivity in terms of OEE (Overall Equipment effectiveness) by applying TPM. While Fore & Zuze.,(2010) Total productive maintenance is the right tool to be implemented by companies that aim to improve OEE.

## *2.2 Innovation characteristic*

Innovation is defined as adding something new to an existing product or process. The key word is add and exist. The product or process has been created from scratch and has performed fairly well. (Harris., 1998). First and foremost, that innovation is driven by people. These people have the personal characteristics of “high need for autonomy, highly motivated integrated regulation, organizational citizenship behaviour altruism, and affective work commitment (Mansfeld et al., 2010). To achieve innovative performance creative people need to take the initiative in promoting their ideas, with the possibility of a price that matches the low quality of performance (Miron et al., 2004). All innovation starts with creative ideas. Creativity is the starting point for innovation. Creativity is however necessary but not a sufficient condition for innovation. Innovation is the cultivation of creative inspiration (Harris.,1998) Although creativity research has revealed many factors that influence individual creativity, little is known about how team-level creativity is determined. Since creative innovation tasks require teams to incorporate and integrate input from multiple team members, team communication patterns are an important determinant of team creativity (Kratzer et al., 2004).

## *2.3 Climate Team*

A person needs psychological security, where he feels confident that he will get a positive response when expressing his thoughts, asking questions, seeking feedback, reporting errors, or proposing new ideas (Edmondson, 1999). More ideas will be presented to the group if each individual feels safe to contribute and take risks (Burch.,2006). Dissent is used effectively to create radical innovation when a psychologically safe team climate is created (Nijstad et al.,2014). Conducive situation as interpersonal security from the creative process to take the risk of failure. Because the main challenge of innovation is to overcome the increased risk of the creative process (Edmondson & Mogelof.,2006). A safe psychological situation in the team has an impact on the team's motivation to share ideas and positively generate solutions (Paulus & Dzindolet.,2008) psychological security is significant in improving organizational performance as evidenced by an increased focus on interdependence, personal responsibility, autonomy, and flexibility as an innovation process (Baer & Frese.,2003)

## **3. Research Methodology**

The research was conducted using the case study method, where the researcher entered the object of research and became part of the team being studied, the research focused on observing, describing, monitoring and analyzing. As well as conducting in-depth interviews through semi-structured questions at the Cilacap Plant, conducting focus group discussions, analyzing data from documents and archives. Triangulated archival data for assessment of TPM activities and innovation champions to generate pattern recognition formulas that can be replicated across all other teams. The research location at PT Solusi Bangun Indonesia Tbk Cilacap Plant. The

research happened to be part of the team that was the subject of the research, namely the “Hidup Bahagia Masuk Surga” Team, SGA mechanical raw mill area. This team has won in a row the 2021 Innovation Champion and 2022 Innovation Champion and the 2021 SIGGIA innovation award, for 2022 the SIGGIA innovation award event is still ongoing with this team sending 3 innovation ideas this year and has prepared 5 innovation ideas for similar events in 2023 and still can increase with the passage of time. The research problem is why innovation only appears in certain teams even though the entire team has received the same training and assistance and the same assessment is carried out in each quarterly routine assessment in the TPM award event with management level being actively involved and supporting and coaching several SGA (small group activity) teams. who became the task force. Researchers have been involved and interacted directly for more than three years with this team.

#### **4. Result**

##### *4.1 Finding*

The company provides extraordinary support for the financing of TPM activities as shown by the budget that continues to increase every year and many work orders related to TPM work. The main expenses are on the purchase of paint and equipment, cleaning equipment, cleaning services and purchasing building materials. Almost all the wants and needs related to this activity. Team “Hidup Bahagia Masuk Surga” making this a momentum to realize their dreams by restoring the mechanical raw mill area and making innovations to get high points for each assessment and there are prizes from various categories such as the best group, best leader, best innovation, best reporting. The innovations raised through TPM activities were also included in the corporate level innovation championship and the SIGGIA Innovation award for 2 consecutive years and advanced to the national level in Lombok at the end of November 2022.

##### *4.2 Pattern Recognition to be an Excellent Team*

Creative Process will grow in a psychologically safe environment so that innovation will continue to grow and become an inherent value in a team. This is because to achieve innovative performance, creative people need to take the initiative in promoting their ideas, with the possibility of a suitable price with low quality performance (Miron et al., 2004) Supported by a conducive situation as interpersonal security from creative process for taking risks from failure. Because the main challenge of innovation is to overcome the increased risk of the creative process (Edmondson & Mogelof., 2006). A safe psychological situation in the team has an impact on the team's motivation to share ideas and produce positive solutions (Paulus & Dzindolet., 2008) this arises from these people having personal characteristics "high need for autonomy, highly motivated integrated regulation, altruism, organizational citizenship behavior, and affective work commitment (Mansfeld et al., 2010). So that it is found that pattern recognition to become an excellent team requires a combination of a creative process that is supported by a psychologically safe environment and produced by people who have the characteristics of "high need for autonomy, highly motivated integrated regulation, altruism, organizational citizenship behavior, and affectiveness. work commitment. An additional factor that helps make it easier for a team to become an innovation champion is maximizing momentum, Team Hidup Bahagia Masuk surga exploits the momentum of total productive maintenance activities. Because the event is mandatory from the state-owned cement holding company PT Semen Indonesia group. So they get an abundance of financial support, technical guidance, and policy support. Because many parties are

interested in this and all parties are certainly happy with the achievement. Management got the positive performance and exposure needed by PT Solusi Bangun Indonesia Tbk as a new member in the Indonesian cement group entity. One of the managers as facilitators got a promotion. Team Hidup Bahagia Masuk Surga gets pride, prizes in the form of money and the opportunity to represent companies competing at the national level and of course foster team motivation to continue to provide innovations that bring benefits to the universe.

## **5. Discussion**

The ability to see the momentum that has emerged or will emerge in the future certainly requires further research. The readiness of the team and the details of the team's way of exploiting this momentum also required more complex research. then Total productive maintenance a part of the momentum created. The suitability of the company's vision and mission and the business focus of a company should be considered as another momentum to be exploited. Good ideas that arise still require a strong narrative to move interested parties so that they get the support and policies needed in the realization and implementation of these ideas. Indeed, by exploiting the momentum it makes it easier to narrate the ideas that arise. It is interesting how strong the impact of a conducive and safe climate can support the creative process that results in the sharing of ideas from the team. Research needs to be done if the conditions are not conducive to climate and the strata of safe conditions are varied in level, whether it produces more diverse results, of course, is interesting to examine further and discuss. The triggering and influencing factors of personal characteristics, namely "high need for autonomy, highly motivated integrated regulation, altruism organizational citizenship behavior, and affective work commitment require further discussion and research.

## **6. Conclusion**

So that it is found that pattern recognition to become an excellent team requires a combination of a creative process that is supported by a psychologically safe environment and produced by people who have the characteristics of "high need for autonomy, highly motivated integrated regulation, altruism, organizational citizenship behavior, and affectiveness. work commitment. An additional factor that helps make it easier for a team to become an innovation champion is maximizing momentum. Good ideas that arise still require a strong narrative to move interested parties so that they get the support and policies needed in the realization and implementation of these ideas.

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