

Guidelines for Technicians Competency Development to Support Sustainable Success of Rail System Technology in The State Railway of Thailand

Apichart Pansuto¹, Taweesak Roopsing², Sunee Wattanakomol³

Abstract

This study was a qualitative research, the purpose of this study was to study the approaches for Guidelines for Technicians Competency Development to Support Sustainable Success of Rail System Technology in The State Railway of Thailand by using Delphi Techniques to obtain a consensus of 33 experts, this research, the reduction of the error was 0.44-0.43, the net change was 0.01, the research tool was an open-ended structured interview for content analysis then developed into a closed-ended questionnaire of estimating scale type. A total of 3 rounds of data collection were performed, the statistics used in the research were percentage, mean, standard deviation, median, mode, and interquartile range. The results showed that, Guidelines for Technicians Competency Development to Support Sustainable Success of Rail System Technology in The State Railway of Thailand, with 100 indicators, the sample group had a unified opinion of all 100 indicators, with the indicators having the highest mean in each aspect as follows:

- 1) Resources aspects: preparing knowledgeable and expertise in rail technology speakers, to support the development of technicians' competencies ($\bar{X} = 4.58$).*
- 2) Content aspects: creating awareness of operational safety for technicians working on the electric train system ($\bar{X} = 4.61$).*
- 3) Practical aspects: such as, training while working ($\bar{X} = 4.64$) and,*
- 4) Motivational aspects: such as having a systematic and fair performance evaluation committee for technicians according to their abilities to be used as a guideline for considering career*

¹ D.B.A. Candidate in Industrial Business Administration, Faculty of Business Administration, King Mongkut's University of Technology North Bangkok, Thailand, s6114011950163@email.kmutnb.ac.th

² Associate Professor in the Faculty of Business Administration, King Mongkut's University of Technology North Bangkok, Thailand, roopsingt@gmail.com

³ Associate Professor in the Faculty of Business Administration, King Mongkut's University of Technology North Bangkok, Thailand, Sunee.w@fba.kmutnb.ac.th

advancement and special consideration is given to employees with excellent performance ($\bar{X} = 4.61$) respectively.

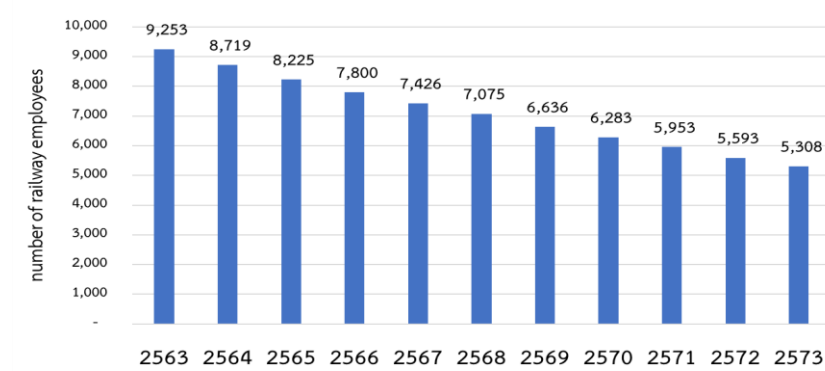
Keywords: State Railway of Thailand, Technical Staff, Competency Delphi Technical.

Introduction

Thailand is moving towards upgrading the quality of its transportation infrastructure, especially the adjustment from road transport to rail transport, to reduce energy consumption and be friendly to the environment, reduce logistics costs. The government has implemented a 20-year national strategic plan (B.E. 2561-2580), in driving economic and social development, enhancing the quality of life of the people, enhance the competitiveness of the country as well as the stability of the country and other development plans related to the rail transport system, such as, the 12th National Economic and Social Development Plan (B.E. 2560-2564). State Enterprise Strategic Plan B.E. 2560-2564, Ministry of Transport Strategic Plan B.E. 2560-2565, State Railway of Thailand has prepared a plan to develop within the organization such as, The State Railway of Thailand Human Resource Strategic Plan B.E. 2562-2571 and The Information and Communication Technology Master Plan of the State Railway of Thailand B.E. 2560-2564. Including, the State Railway of Thailand Rehabilitation Plan 2558-2567 B.E., which is being implemented according to the plan and activities to be consistent and coherent with the master plan, together with relevant government policies to develop the organization to achieve the goals that the State Railway of Thailand has set its vision. During the years of 2558-2569 B.E. it was found that, the government has invested more in the development of Rail Transportation than in the past. The State Railway of Thailand has been assigned to be responsible for the development and construction of various projects including, projects currently under construction and that will happen in the future, consisting of:

- 1) Double Track Railway Project (The width of the track is 1 meter) with an estimated budget of 568,465.07 million baht.
- 2) Red Line Mass Rapid Transit System Project (The width of the track is 1 meter) using the amount of approximately budget for 99,840.40 million baht.
- 3) High-Speed Rail Linking Three Airports Project (The width of the track is 1.435 meters) with an amount of approximately budget for 224,544.36 million baht and,
- 4) Thai-Chinese high-speed rail system project (The width of the track is 1.435 meters.) The budget is approximately of 179,000 million baht, with a total investment budget of 1,071,849 million baht.

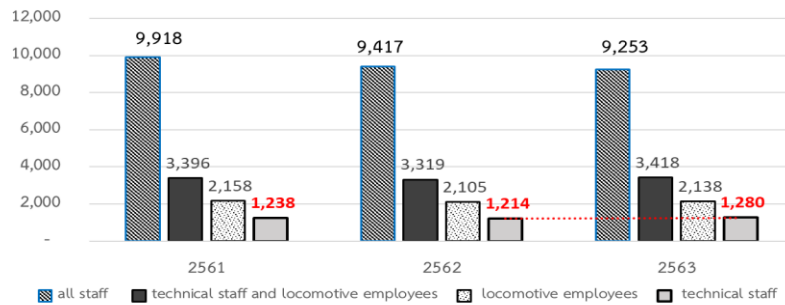
Figure 1. Graph showing the trend of the number of railway employees in B.E. 2563–2573 (The State Railway of Thailand, B.E. 2566).



From the past government policies on July 28, B.E. 2541, the cabinet resolution has a policy to limit manpower by requiring the State Railway of Thailand to accept new employees only 5 percent of the employees who leave. or retire only, as a result, the number of employees and employees of the State Railway of Thailand has always decreased according to the statistics of the power rate at the end of December B.E. 2562 in the Thailand State Railway.

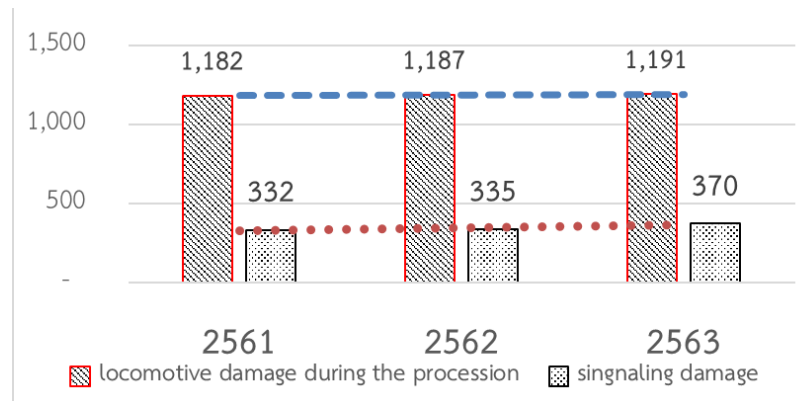
Originally, the power rate framework approved by the State Railway of Thailand amounted to 18,015 positions, leaving only 9235 powers in the year 2563 B.E. and during the years 2563-2573 B.E. or in the next 10 years, there will be a tendency of the rate in steadily declining, because there are employees who retire every year, it can be analyzed that, in the future, the State Railway of Thailand will face problems with the number of employees in the organization and will affect the number of technical staff that there will be insufficient for the maintenance operations that are increasing compared to the amount of work in various projects that occur, which must be maintained in various jobs when the construction work in various projects is completed.

Figure 2. Number of technical staff and locomotive staff of the State Railway of Thailand During the year 2561-2563 B.E. (The State Railway of Thailand, B.E. 2563)



From Figure 2, if the statistics of the number of technical staff and locomotive employees of the State Railway of Thailand during the year 2561-2563 B.E. to analyze and find that Technical Staff tends to decrease, in B.E. 2563, there will be a total of 9,253 employees, consisting of employees working in the operations department, namely: Department of Mechanics Civil Engineer, Department of Special Projects and Construction, Department of Signaling, which totals 3,418 people (1,280 technicians for maintenance, locomotive staff train driver and 2,158 mechanics). If comparing the number of operational staff with the number of jobs responsible for maintenance that will increasing in the future such as, railway maintenance work, signaling system work, road barrier system work, telecommunication system work and system of repair wheeled locomotive work. Including, other related tasks that will always cause the maintenance work in various jobs to be inefficient, which can be seen from the statistics of the number of tendencies of locomotive damage during the procession and signaling system. During the years 2560-2563 B.E., there is a tendency of locomotive damage during the procession and the malfunction of the signaling system is constantly increasing, this defect causes the train to run not on time of its round, affecting the service in bus and freight operations, loss of image and confidence in public service. If the trend of maintenance problems locomotive during the procession and signaling equipment that occurs each year, it can be analyzed that the damage can be caused by many factors such as, the locomotive is in old condition, has been used for many years, is constantly being used heavily, the maintenance is not according to the schedule, the number of maintenance personnel is not enough, insufficient spare parts or technical personnel in maintenance still lack potential.

Figure 3. Trends of locomotive damage during the procession and signaling system during the year 2560-2563 B.E. (The State Railway of Thailand, B.E. 2563)



From Figure 3, it was also found that, during the years 2560-2563 B.E. there was a tendency of locomotive damage during the procession and the malfunction of the signaling system is constantly increasing, it can be analyzed that the breakdown may be caused by many factors including: The locomotive is in old condition, has been used for many years, is constantly being used heavily, maintenance is not on schedule, the number of employees in maintenance is not enough, insufficient spare parts, or technical personnel in maintenance still lack potential.

From the statistical information and the reasons for the various factors mentioned above it was found that, State Railway of Thailand, there are problems related to operational performance as follows:

- 1) Problems from lack of availability of resources to be used to develop the competency of technicians to be effective in maintenance.
- 2) Problems from higher technology in rail system It is rapidly progressing as well as complicated in the process. And more maintenance methods, technical staff should be developed knowledge.
- 3) Problems from the learning model in the development of technical staff is still inefficient, does not meet the standards of technology in rail systems that are complex and rapidly advancing. and,
- 4) Problems of technicians who still lack skills and expertise, including lack of motivation to learn and develop themselves in work.

From the problems of the State Railway of Thailand mentioned above. The researcher therefore has an interest on the approaches for developing the competency of technical staff of the State Railway of Thailand to be strengthened and develop continuously. Therefore, it is the source of the research on “Guidelines for Technicians Competency Development to Support Sustainable Success of Rail System

Technology in The State Railway of Thailand". The researcher expected that this research will contribute to the achievement of the goals of the 20-year national strategy (B.E. 2560-2579) in the development of human resources and capacity and in accordance with the goals of the Rail System Standard Development Plan (B.E. 2560-2570) in the strategy of developing research studies and personnel development strategy including, bringing it to develop the organization of the State Railway of Thailand in the future.

Research Objectives

To study the components of technicians competency to support sustainable success of rail system technology in The State Railway of Thailand.

To develop guidelines for technicians competency development to support sustainable success of rail system technology in The State Railway of Thailand.

Research Elements

From the issues mentioned above the researcher has studied, researched, concepts, documents, theories and research related to the research. and can synthesize the guidelines into 4 elements, namely 1) Resource 2) Content 3) Practice and 4) Motivation

Research Methodology

This research is a Qualitative Research by using the Delphi Technique (Qualifications of Experts) was considered from the experience and responsibilities related to developing the competency of 33 technicians. There is an Error Reduction at 0.44–0.43 and the error rate (Net Change) of the data to be summarized as a result of the research is the least, only 0.01 (Thanin, B.E. 2563 : 109). In this research, experts were divided into 3 groups which are executives of government organizations/state enterprises, amounting to 11 people, a group of 11 teachers in educational institutions and a group of 11 executives of the railway industry. Statistics used in data analysis were percentage, mean, median, mode and interquartile range. Data analysis was performed in a systematic procedure based on expert group consensus measurements.

By considering the consistency of opinions with an interquartile range of less than or equal to 1.5, which is in accordance with the guidelines of qualitative research using the Delphi technique (Wantanakomol, S. and Silpcharu, T.: 2020) with the characteristics of the tools used in the

research For qualitative research using the Delphi Technique, in this research to allow experts to express their opinions by providing feedback to a group of experts. The data will be analyzed in the next round to study and analyze the body of knowledge that still does not have a clear answer. By gathering and distilling knowledge from experts in that field, with the form and method of creating tools as follows:

Step 1: Prepare research methods by studying textbooks and other literature related to concepts, theories and basic information related to the competency development of technicians in the State Railway of Thailand to support rail technology. as well as preparing knowledge on qualitative research methods. Study research related to research with the Delphi technique. Researcher's Code of Ethics Data Collection Method Methods for data analysis and qualitative research leading to the creation of accurate research tools and used as a guideline for a comprehensive management interview according to the scope of research to be studied and to achieve the specified objectives

Step 2: Follow the research plan by interviewing according to the semi-structured interview. Semi-structured interview and Likert's Rating Scale questionnaire using a research process according to the Delphi Technique, in which the selected experts were asked to answer the questionnaire 3-4 rounds and how to construct it. Tools for each step as follows:

Round 1. provides a set of questions that have been created, this is a semi-structured open-ended interview in which the researcher will determine interview guidelines in 4 aspects namely; Resources, Content, Practice and Motivation to be a guidelines for developing the competency of technicians in the State Railway of Thailand to support rail system technology with Delphi techniques.

Round 2. The researcher used the information obtained from the interview in round 1 to process by classifying the content into issues and grouping data with common characteristics or have similar meanings together, then give meaning or classify the name of that data group (Content Analysis), for developed into a closed-ended questionnaire with an estimation scale of the 2nd version, which was set to 5 levels of opinion scores and brought to experts to answer the questionnaire by giving weight to the importance of various matters.

Round 3. The researcher used the results of all expert questionnaires in Round 2 to calculate the median and Interquartile Range in order to review opinions in the second round, along with providing feedback in terms of considering the consistency of the answers compared to the overall expert's answer position, which is, if it is not consistent, the experts need to provide additional justifications to confirm the clarity of the data, the information obtained will show the priority percentage

of congruence and inconsistency of opinions in bringing valuable information to diagnosis and lead to accurate and reliable research conclusions.

Results

Summary of opinions of experts who give opinions on the development of technical staff's competency in The State Railway of Thailand to support rail technology that is beneficial for enhancing knowledge and skills of technicians as follows: 1) Establish a program to develop the competency of technicians to have innovation capabilities for creative development 2) The organization should have a database system that can be accessed easily and conveniently. And modern 3) Learning through online media is more effective in use than learning. Usually because it is convenient and easy to access. 4) Training from a virtual trainer. would be very helpful and will add learning experience and helps to understand the work well in case you can't go in and learn, training from real equipment is possible 5) Interagency cooperation is very helpful for good employee training. 6) The establishment of a community of practitioners should be encouraged to exchange knowledge on more technical issues. 7) There must be a daily operating manual and technical review. 8) There is an examination of the maintenance process that employees cannot follow according to the procedure. 9) The development of technicians should be done continually and sustainably. 10) Knowledge transfer must be practical guidelines. 11) The curriculum should be improved in accordance with the competency of the technician position. 12) The use of information technology systems should emphasize on providing technicians with a good foundation. 13) Lessons learned from good overseas maintenance should be applied to similar maintenance jobs. Be aware of safety because it is the most important thing. 15) Develop more thinking and decision-making process of technicians. will be able to help solve various operational problems immediately 16) Share knowledge to gain more preventive knowledge 17) Collaborate with other departments to create more perspectives for employees 18) Set technical staff development plans and procedures clear 19) Organizing knowledgeable speakers to give lectures will be more effective if the knowledge gained is put into practice or actual practice 20) Practical training can be used as a forum to exchange knowledge with technicians as well. 21) Having discussion meetings can be a guideline to help solve technical problems better and should be done on a regular basis. 22) Using a mentor system to help learn while performing work will make understanding better. Using a mentor system to help learning while performing work will make understanding better. 23) Technical staff should learn directly from the manufacturer's products. 24) For training and learning, resources

can be shared 25) Emphasize the use of real tools and the use of virtual tools. 26) Should self-learning may require interesting stimulation and motivation from the organization. 27) Learning should be created on online media more in line with the new way of life, but emphasizing on practice and self-study as well. 28) Technicians should gain knowledge from internal training courses. and externally. 29) Sharing knowledge with colleagues should be a regular part of work. 30) Technicians should always have the opportunity to try out new jobs. 31) Job Rotation: Create more learning opportunities in different jobs. 32) Technicians should focus on practical training in Create professional standards to understand the work system that is used primarily, may not have to focus on only academics. 33) Experience from role models can be used to help learn methods. 34) Work review emphasizes employee action rather than skill development. 35) Assessment of performance should emphasize the importance of technical evaluation results. 36) Technicians should focus on practical training in creating career standards in their work systems. 37) Use assessment results as guidelines for improvement and development of technicians.

To develop the competency of technicians to continuously improve the skills and competencies of technicians. to adapt to the technological progress in the railway industry To enhance the knowledge and skills of technical staff that in this research An analysis of opinions towards the development of technical staff's competency in the State Railway of Thailand to support rail technology Appraisal Scale and Open-ended Questions for Commenting on Round 3 Confirmation For the analysis of the expert group's review of Guidelines for developing the competency of technicians in the State Railway of Thailand to support railway technology To be used as a guideline for developing the competency of technicians in the State Railway of Thailand to support the technology of the railway system. It will benefit the technicians of the State Railway of Thailand to support the technology of the railway. In the 3rd round, categorized by 4 aspects by experts There are unanimous opinions in 4 aspects, with an important rating based on the average opinion on the approach to develop the competency of technicians in the State Railway of Thailand to support rail technology. Each element ranks the top 3 indicators in descending order as follows:

1. Guidelines for Developing the Competency of Technicians in the State Railway of Thailand to Support Rail System Technology, Using Delphi Technique in terms of Resource, it was found that, the 1st place was to provide knowledgeable speakers expertise in rail technology to support the development of technical staff's competency as No. 1 ($\bar{x}$ = 4.58, S.D. = 0.561, Med = 5.00, Mode = 5) with an interquartile range of 1, 2nd which are preparing technicians to be ready to work

according to the organization's needs by exploring the need to develop the competency of technicians to support rail technology ($\bar{x}$ = 4.58, S.D. = 0.614, Med = 5.00, Mode = 5), have an interquartile range of 1 and 3, namely; prepare the Functional Competency of the technical staff for use in planning the development of individual employees clearly and systematically ($\bar{x}$ = 4.52, S.D. = 0.566, Med = 5.00, Mode = 5) with a range between quartile at 1.

2. Guidelines for developing the competency of technicians in the State Railway of Thailand to support technology The rail system in terms of content (Content) found that, the 1st place was, creating awareness of operational safety for technicians working on the electric train system as a priority 1st ($\bar{x}$ = 4.61, S.D. = 0.556, Med = 5.00, Mode = 5) with an interquartile range at 1, 2nd place is to build knowledge and develop necessary competencies in the work of technicians in train maintenance using rail technology ($\bar{x}$ = 4.58, S.D. = 0.561, Med = 5.00, Mode = 5) with a range between quartile equal to 1 and 3rd place is improving the curriculum to be in line with the competency of the position of a railway technician that meets international standards and related engineering standards ($\bar{x}$ = 4.48, S.D. = 0.566, Med = 5.00, Mode = 5) with interquartile range equal to 1

3. Guidelines for developing the competency of technicians in the State Railway of Thailand to support rail technology in terms of Practice it was found that, the 1st place was On the Job Training that ranked as the 1st ($\bar{x}$ = 4.64, S.D. = 0.489, Med = 5.00, Mode = 5) with an interquartile range of 1, ranked 2nd namely, job Coaching from trainers or supervisors who can advise, teach, transfer knowledge and techniques related to rail technology to technicians directly ($\bar{x}$ = 4.52, S.D. = 0.508, Med = 5.00, Mode = 5) with an interquartile range of 1 and on the 3rd namely, organize workshops on important topics and technical tasks related to rail technology for technicians to gain more expertise ($\bar{x}$ = 4.48, S.D. = 0.619, Med = 5.00, Mode = 5) with a range between quartiles at 1.

4. Guidelines for developing the competency of technical staff in the State Railway of Thailand to support the technology of the railway system in terms of Motivation, it was found that the 1st place was that, there is a performance appraisal committee systematically and fairly with technicians according to their abilities to serve as a guideline for considering career advancement and special consideration will be given to employees with excellent performance as number 1. ($\bar{x}$ = 4.61, S.D. = 0.609, Med = 5.00, Mode = 5) with an interquartile range of 1, 2nd place such as, paying attention and paying special attention to employees with high potential on career advancement in special cases to be an incentive to retain Talent in the organization. ($\bar{x}$ = 4.48, S.D. = 0.566, Med = 5.00, Mode = 5) with an interquartile range of 1 and 3rd which are, allowing technicians to work fully and participate

in solving problems arising in the work process, ($\bar{x}$ = 4.48, S.D. = 0.619, Med = 5.00, Mode = 5) has an interquartile range of 1.

Discussion of Research Results

1. According to the results of content analysis, it was found that, a group of experts has opinions on the approach to develop the competency of technicians in the State Railway of Thailand to support rail technology, resulting in 4 components consisting of: 1) Resources. 2) Content. 3) Practice and 4) Motivation. All 4 components are consistent with the research results of Irina (B.E. 2562) found that, resource basis for the development of strategic potential of the railway organization under the framework of a competitive approach, including resources, basic capabilities and creating shared values, consistently measures to increase the level of readiness and quality of resources, competencies and individual competencies, this is consistent with the research of Anchalee (B.E. 2564) that, competencies are useful and important to human resource management, consisting of: recruitment, selection, personnel development for long-term learning and do not focus on learning only training in the classroom. Incentives, rewards and compensation, career advancement planning and evaluation, consistent with the research of Suchada and Chandras (B.E. 2564) found that, 1) The educational resource management level consists of: personnel management, finance, materials, equipment and buildings. 2) Academic administration consists of: curriculum development, development of curriculum-based learning processes measurement, evaluation and transfer of academic results improving the quality of education, development of media, innovation, technology and learning resources and, 3) The management of educational resources, in the resource component is consistent with the research of Phra Mahananthapong and Surin (B.E. 2564) concluded that, educational resource management consists of: 1) Personnel. 2) Budget. 3) Equipment and 4) Management in the content component, it is consistent with the research of Thitima et al. (B.E. 2560) found that, the preparation of the vocational workforce must have 3 issues as, 1) Knowledge. 2) Attitude and 3) Skills, in line with the research of Apichart (B.E. 2561) found that, the knowledge management model for schools has 5 components which are: 1) Knowledge Repositories. 2) Exchange. 3) New Knowledge Creation. 4) Searching, and 5) Communication in the practical component, consistent with the research of Kanyawit et al. (B.E. 2565) found that, the quality of the activity-based training model using the MIAP learning model consisted of 4 learning steps which are: 1) The introduction stage. 2) The knowledge content stage. 3) The exercise stage, and 4) knowledge check step. In which every step can encourage participants to practice

relationships or work together, and it is consistent with the research of Manas et al. (B.E. 2559) found that, components and development of knowledge transfer model in rice mill industry consists of 4 components as: 1) The knowledge. 2) Knowledge provider. 3) knowledge receiver and 4) organizational support. in the motivation component, this is in line with the research of Sombat (B.E. 2561) that applied Maslow's 5-level needs theory and Herzberg's motivation theory, that saw that, there were motivation factors in personnel performance in 4 important educational institutions which are: 1) Salary, welfare and benefits. 2) Security and progress. 3) Personnel relations and participation in management and, 4) Operation conditions and missions in their responsibilities. This is consistent with the research of Any Werdhiastutie, Fendy Suhariadi, Sri Gunani Partiw (2022) which concluded that, developing incentives to suit individual needs will result in a better direction for the quality of the organization and contribute to the improvement of the quality of the human resources of the organization, consistent with the research of Ketsarin and Suramongkol (B.E. 2565) found that, the Career Advancement Expectations welfare satisfaction convenience influencing employee involvement in the organization Consistent with research by Peerapat (B.E. 2564) it was found that, the level of motivation to work had an overall average at a high level, in each aspect, it was found that success in work, respect, nature of work performed, responsibilities and advancement in job positions, the overall average was at a high level, consistent with research by Narongsak et al. (B.E. 2565) found that, motivation factor and the overall supporting factors were at a high level, worker motivation factors in engagement creation acceptance of each other in the organization, keeping employees engaged and loving the organization, in addition to monetary rewards, can be used to create a human resource development model in the organization. Consistent with Sansern's research (B.E. 2563), it was found that, motivation that is important in the work of employees is income security, employment, social needs, work satisfaction and organizational commitment.

2. According to the results of the study on the development of technical staff competencies in the State Railway of Thailand to support rail technology in terms of resources (Resources), it was found that, the indicators that the experts agreed to be unified were, provide speakers with knowledge and expertise in rail technology to support the development of technicians' competencies and prepare technicians to be ready to work according to the needs of the organization by exploring the need to develop the competency of technicians to support rail technology, this is because employees are an important resource and are widely recognized as the most important factor in an organization's success or failure (Wattanakomol

& Silpcharu, 2023), this is in line with the research of Watcharee et al. (B.E. 2562) who found that, There are 5 guidelines for the preparation of the human resource management department namely; 1) Human resource procurement. 2) Human resource utilization. 3) Human resource development. 4) Human resource maintenance, and 5) Human resource management, employee relations and communication. This is consistent with the idea of Nadler and Wiggs (1989: 3) who stated that, human resource development is a planning process for capacity development, systematically improve, the operational efficiency of employees, to create knowledge, understanding, skills, behaviors and good attitudes that can increase the efficiency of the work of the organization by taking 3 actions as follows: 1) Training for learning the job can bring knowledge to be used in practice. 2) Education to prepare people to be ready to work according to the needs of the organization and, 3) Development to help prepare the personnel to learn about things that might happen in the future.

3. According to the study results of the development of technical staff competency in the State Railway of Thailand to support rail technology in terms of content, it was found that, the first indicators that the expert group agreed on were, raise operational safety awareness for technicians working on the electric train system. This is consistent with research by Narin and Noppadon. (B.E. 2565) found that, the innovative management process for railway maintenance of the State Railway of Thailand will consist of performance, in terms of reliability safety reducing pollution of the environment and energy saving with guidelines for the development of innovative management for maintenance and maintenance of railway tracks systems, there is a testing organization to certify the safety standards according to the technical requirements and international standards railway maintenance requires equipment with higher work efficiency and the preparation of a corporate risk management manual covers strategic, financial, operational and legal compliance risks.

4. From the results of a study on the development of the competency of technical personnel in the State Railway of Thailand to support the technology of the railway system, in terms of Practice, it was found that the indicators that the experts agreed to be unified were at the first. On the Job Training, which is in line with the concept of Medhi (B.E.2559 : 15), on-the-job training (OJT). It is a process or method that helps develop and train employees to have competence, skills, expertise, as well as experiences suitable for work, resulting in employees with higher competence and good work attitude and the organization is more efficient and effective about OJT coaching method. It is a method that is very effective and inexpensive, the work has been accomplished according to the goal, this is in line with the

research of Nontalee (B.E. 2560) on the development of Active Learning management, the activities can be applied in teaching, practicing class presentation skills participate in teaching and learning activities. and this is in line with the research of Sukhawatthanakun et al. (2023) indicated that organizations could develop their employees' competency via updated technology training on-site and outside the organizations

5. According to the results of the study of the development guidelines for technical staff competency in the State Railway of Thailand to support rail technology in terms of Motivation, it was found that, the indicators that the experts agreed to be unified were, there is a systematic and fair performance appraisal committee for technical staff according to their abilities to serve as a guideline for career progression and special consideration is given to employees with excellent performance, which is consistent with the research of Kamolphiphat and Wiroj (B.E. 2564) found that, organizational justice and work motivation of supporting personnel of Rajamangala University of Technology Phra Nakhon were at high level, performance is at a high level, boredom at work was at a moderate level, organizational justice has a positive effect on motivation, job performance and organizational justice has a negative effect on employee boredom.

Research Benefits

- 1) Industrial sector will create a way to promote and support and to find a way to plan for the development of the competency of the technicians in the State Railway of Thailand to support the technology of the railway system
- 2) Government and related agencies to know the results of building a database system of employees regarding the development of technical staff's competency. management of organizational restructuring and planning an appropriate budget for the development of the competency of technicians in The State Railway of Thailand to support the technology of the railway system.
- 3) Education sector It can be used for academic benefits by using it as a guideline to develop a curriculum to provide knowledge in developing the competency of technicians in The State Railway of Thailand to support railway technology.

Suggestion

Suggestion from research results

1. Policy-level organizations.

1.1. Ministry of Transport And the Office of the National Economic and Social Development Board (NESDB) and the State Enterprise Policy Committee (Public Organization) should have a policy to promote and support the State Railway of Thailand, develop personnel in the rail system to be more quality, enough with supporting the growth of the rail transportation system, develop human resource performance management system, knowledge management is important in development, increase skills, knowledge, have sufficient performance and in time to drive corporate strategy, the workforce development framework of the State Railway of Thailand should be established to provide an overall manpower framework, that is in line with the business rehabilitation plan and the structure of the railway industry.

1.2 Department of Rail Transport Railway training institute standards should be created. Prepare a plan to enhance expertise and the potential of personnel to become a rail system service provider, it is internationally accepted.

1.3 Institute of Professional Qualifications (Public Organization) should develop a national professional qualification system, support occupational groups or professional groups in setting up occupational standards to meet international standards certification of individual performance according to professional standards, especially in the field of logistics infrastructure.

1.4 The State Railway of Thailand should establish cooperation between agencies, collaborate with the public and private sectors, manage work structure to be appropriate, position of chain of command, clear division of responsibilities, not redundant, have a manpower framework that is appropriate to the structure and workload, retain talented people, create works and innovations that respond to policy directions, it is in accordance with the organization's strategy.

1.5 Electric Railway SRT Company Limited (subsidiary company) should create a knowledge and develop necessary competencies for the work of technicians in railway maintenance and raise awareness of operational safety for technicians working on the electric train system.

2. Operation level agencies

2.1 Human Resources Department Knowledge management should be accelerated. Improve and develop the efficiency of work processes until innovations are created for the organization. Set up a systematic and fair performance appraisal committee for career advancement, focusing on employees with high potential. Opportunity for employees to postpone their careers Create morale and encouragement at work Have a clear succession plan. and fairness according to good governance principles.

2.2 Railway Training Institute, the curriculum should be revised to be in line with the competency of the technical position on rail systems, which meets international standards and related engineering standards.

2.3 Operations department related to maintenance work, should concentrate on training for technicians to practice while actually working (On the Job Training), transferring technical knowledge, organizing workshops on important topics in technical work related to rail technology for technicians to become more knowledgeable.

2.4 Information Technology Department, should be a plan for the development of technology systems to manage human capital management work.

3. From the suggestions above The recommendations that will affect the development of technical staff can be summarized into 7 aspects (7P) as follows: 1) Policy 2) Prescribe 3) Professional 4) Potential 5) Partner 6) Prevention 7) Promote

Guidelines for cooperation between agencies

Guidelines for cooperation with various agencies that are beneficial for improving the performance of railway technicians. effectively succeeded in developing it; Ministry of Transport and the Department of Rail Transport It has a duty to supervise and inspect standards related to rail technology. It must be clear and ready to support personnel in the rail system. Including personnel of The State Railway of Thailand. especially the group of technical staff to strengthen personnel development Promote and support to create a body of knowledge. technology transfer talent development and technological expertise in rail systems Including technical training tool support. Collaborate on curriculum design Management of teaching and learning, training, exchange of learning tools to develop manpower. and expertise in rail transportation technology together. In particular, raising awareness of operational safety for technicians working on the electric train system. Including having to create cooperation with various agencies, which should have the following units: NSTDA, The Federation of Thai Industries. Thai Railway Engineering Association. Department of Skill Development, Academy and University. Mass Rapid Transit Authority of Thailand, S.R.T. Electrified Train Company Limited (SRTET), including private agencies involved in the rail transport system. Institute of Professional Qualifications (Public Organization), professional groups for the preparation of professional standards to meet international standards Certification of individual performance according to professional standards Especially the branch of the rail system. Including agencies that have previously arranged to sign a memorandum of understanding on network cooperation in government, education and service sectors, totaling 14

agencies to support the development of manpower and expertise in rail transportation technology. of the country under the joint development projects of network agencies both now and in the future under the name "Manpower development network and technology expertise in the country's rail transportation system" in 2015

Suggestions for further research

The researcher conducted the research. To study the components and to develop guidelines for technicians competency development to support sustainable success of rail system technology in The State Railway of Thailand. which in researching this rail system There will be a limitation on the number of samples involved in the direct rail transport system with a limited number. Because there are insufficient agencies working on rail transport for quantitative research. which the main agency in providing bus service will consist of departments: The State Railway of Thailand, S.R.T. Electrified Train Company Limited (SRTET), Mass Rapid Transit Authority of Thailand, Bangkok Mass Transit System Public Company Limited, which is the reason why the research must be carried out with qualitative research using the Delphi technique. The sample group used in this research will use 33 experts with a 0.01 expectation rate. can use quantitative research or research that combines quantitative and qualitative research. The sample group must be defined as appropriate as follows:

1. Conduct a research to confirm the model components of the development of the technical staff competency of the State Railway of Thailand to support the rail system technology with Delphi techniques.
2. Conduct a research on the structural equation model, a model for developing the competency of technicians in the State Railway of Thailand to support rail system technology with Delphi techniques.
3. Conduct a study of new knowledge with quantitative research on the development of the competency of technicians in the State Railway of Thailand to support rail system technology with Delphi techniques.

Bibliography

- Anan Boonsanong. (B.E.2555). Human resource management. Bangkok: TS.
- Anchalee Chaisri. (B.E.2563). Human resource management on fundamentals of competency, Journal of Academic Affairs Boreeram University, Vol 5, No. 2: 234-248.
- Any Werdhiastutie, Fendy Suhariadi, Sri Gunani Partiw. (2022). Achievement Motivation as Antecedents of Quality Improvement of Organizational Human Resources. Budapest International Research and Critics Institute-Journal (BIRCI-Journal). Volume 3. No. 2: 747-752.

- Apichat Phromfai. (B.E.2561). Development of management Knowledge model for schools in Chaiyaphum Province, Pathumthani University Journal, Vol. 10, No. 1: 275-280.
- Commission economic development and national society, Office of the Prime Minister. [Online]. B.E.2566. Economic Development Plan and National Society, No. 12 [Retrieved on January 20, B.E. 2566]. From <https://www.nesdc.go.th/ewtdlink.php?nid=6422>. Development Council Office National Economy and Society. [Online] B.E.2566. National Strategy B.E.2561-2580. [Retrieved on January 20, B.E.2566]. From <https://www.nesdc.go.th/download/document/SAC/NSPlanOct2018.pdf>
- Irina Tokmakova, Natalia Panchenko, Hanna Obruch, Anastasia Kozlova and Hanna Zaiets. (2019). Assessment of strategic development potential of the production units of enterprises of railway transport. https://www.shs-conferences.org/articles/shsconf/pdf/2019/08/shsconf_NTI-UkrSURT2019_02009.pdf
- Kamolpiphat Chanasit and Wiroj Jesadalak. (B.E.2564). "Study the influence of justice in the organization that results on motivation to work boredom in work and performance of support personnel Rajamangala University of Technology Phra Nakhon." Journal of Humanities and Social Sciences, Ubon Ratchathani University, Vol. 12, No. 1: 268-297.
- Kanyawit Klinbamrung, Jakkrit Benjamaha and Sakwichit Mankong. (B.E.2565). "Development of a training model by Apply for events as a foundation and learning model for MIAP on the production of teaching materials." Journal of Research and Innovation in Vocational Education, Vol 6, No. 2, 151-160.
- Ketsarin Thongsopon and Suramongkol Nimchit. (B.E. 2565). Career advancement and satisfaction with welfare effect on organizational involvement: a case study of a company Aviation Industry Co., Ltd. University Academic Journal management and technology eastern, Vol. 18, No. 2: 1-13.
- Manas Chupaka, Teerawut Bunyasophon, Kanit Chelayjanya and Supatta Pinthapaet. (B.E. 2559). Transfer knowledge in rice mill industry. Academic journal King Mongkut North Bangkok. Vol 26 No. 3: 499-505.
- Ministry of Transport. (B.E.2566). [Online]. Strategy development of Thailand's transportation system 20 years (B.E. 2561-2580). (Retrieved on 20 January B.E. 2566). From https://web.dlt.go.th/dlt-direction/media/attachments/2565/07/08/20_62.pdf
- Nadler, Leonard, and Wiggs, Garland D.. (1989). Managing Human Resource Development. San Francisco: Jossey-Bass.
- Narin Intawong and Noppadol Phanpanich. (B.E.2565) Innovation Management Approaches Maintenance of Railway Tracks Thailand, Journal of Social Sciences and Anthropology of Buddhism, Vol. 7, No. 4. 113-128.
- Narongsak Poonngern, Sunutcha Kunasol and Pattaraporn Jirachot Arpha. (B.E.2565). Study of motivation in practice. Employee's work Chokthavorn Plastic Limited Partnership Journal of Management and Social science review, Vol 5, no. 3: 113-120.

- Nonthalee Porntadawit. (B.E.2560). Development of learning management proactive in learning management subject, Rajamangala Research Journal, Bangkok. Vol. 11, No. 1: 85-94.
- Peerapat Somson. (B.E.2564). Effect on the efficiency of work of staff operation level of Pak Kret Royal Irrigation Department Nonthaburi Province, Journal of the University of Management and Eastern Technology, Vol. 18, No. 1: 172-183.
- Phramahanantapong Yankavee and Surin Phusing. (B.E.2564). Participation in Administration Educational Resources Khon Kaen University Graduate Studies Journal, Vol. 8, No. 4: 14-21.
- Sansern Satthaworn. (B.E.2563). A study of work motivation of Japanese company employees in the 21st century. Journal of Japan Studies. Vol. 37, No. 2 : 98-113.
- State Railway of Thailand. (B.E.2565). [online]. Human Resource Strategic Plan of State Railway of Thailand B.E.2566-2570. [Retrieved on January 20, B.E.2566]. From <https://intranet.railway.co.th/seminar/index.php?topic=916.msg936#msg936>
- State Railway of Thailand (B.E.2563). [Online]. Plan State Railway of Thailand (B.E.2560-2564) Fiscal Year 2564 B.E. [Retrieved on 20 January B.E.2566]. From <https://intranet.railway.co.th/seminar/index.php?topic=736.0>
- Sombat Ariyasarn. (B.E.2561). to study motivation for practice the work of personnel in educational institutions Roi Saen Abhaibhubejhr Journal, Vol. 3, No. 2, 33-46.
- Suchada Bannakit and Chandrasam Phuti Ariyawat. (B.E.2565). Management of official resources studies that affect management academic work of the school under the jurisdiction of the regional office secondary education, Area 3. Journal of Peace Studies Review, MCU, Vol 10, No. 7: 2853-2864.
- Sukhawattanakun, K., Roopsing, T., & Silpcharu, T. (2023). Industrial Procurement Management Efficiency Guidelines: Perform Excellence Through Organisational Change Strategies. International Journal of Professional Business Review, 8(4), e01770. <https://doi.org/10.26668/businessreview/2023.v8i4.1770>
- Sukhawattanakun, K., Roopsing, T., & Silpcharu, T. (2023). Industrial Procurement Management Efficiency Guidelines: Perform Excellence Through Organisational Change Strategies. International Journal of Professional Business Review, 8(4), e01770. <https://doi.org/10.26668/businessreview/2023.v8i4.1770>
- Thanin Siljaru. (B.E.2563). Research and statistical data analysis using SPSS and AMOS. 18th edition. Bangkok: Partnership General Business R&D.
- Thitima Saowayong, Achara Sripan and Nuttachet Poolcharoen. (B.E.2560). Development trends of vocational manpower type of commerce vocational certificate level (vocational certificate) in the lower northern region to support entry to the Asian community, Journal of Humanities and Social Sciences (GTHJ). Vol. 23, No. 10: 99-112.

- Wantanakomol, S. and Silpcharu, T. "Strategy for Preventing Corruptions in Industrial Business Organizations with Delphi Technique". Academy of Strategic Management Journal. Vol.20 No.3 (June 2020)
- Watcharee Puechphon, Atthapong Limpkanjanawat and Nantipa Bussapwattana. (B.E.2562). Management readiness of the human resources of the place operating in the province Surat Thani for stepping into the ASEAN Economic Community. Journal of Management Sciences. Vol. 6, No. 2: 305-325.
- Wattanakomol, S. & Silpcharu, T. (2023). Characteristics of entrepreneurs in sustainably successful micro, small, and medium enterprises. Uncertain Supply Chain Management. Vol. 11 No 3.
- Wichai Thosuwanchinda. (B.E.2550). [Online]. Employee Development Techniques (On the Job Training) [Retrieved January 20, B.E.2566] from <https://www.gotoknow.org/posts/275597>.