บทสรุปผู้บริหาร

การพัฒนาคู่มือปฏิบัติงานสำหรับการวิเคราะห์ความเสียหายของล้อและเพลารถไฟ

Development of Work Instruction for Failure Analysis of Railway Wheels and Axles

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Collaborative agency	State Railway of Thailand
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Background

Railway wheels and axles are important parts of the rolling stock in the rail transportation system because it has a direct effect on accidents and the safety of the passengers. If those parts break during service, it will lead to a number of severe accidents as reported in the media both international and domestic. To reduce the chance and prevent train accidents, non-destructive inspection technology has been introduced. Non-destructive inspection and predictive maintenance are increasingly being used for railway wheels and axles. However, due to the limitations of testing equipment and maintenance methods, railway wheels and axles may still be undetectable defects in the material. This can eventually lead to damage. Therefore, when the railway wheels and axles are damaged, it needs to be analyzed properly and systematically to find out failure modes and root cause of damage. This will lead to the formulation of preventive measures and corrective measures to prevent recurrence in the future.

The working manual for failure analysis of railway wheels and axles manual has developed guidelines for inspecting and collecting samples of damaged train wheels and axles at the site. This was followed by in-depth laboratory analysis if need. It mainly focusing on the case of damage analysis of tired wheel and locomotive axle parts which corresponds to the needs of users, such as the State Railway of Thailand and private railway operators, etc.

Objectives

1. To establish the working manual for failure analysis of wheel and axle.
2. To establish a reference document on damage patterns to solid wheels, tire wheels of various types of trains and locomotive axles which collected from case studies of parts from SRT.
3. To provide training for those who use this manual.

Target users/customers

State Railway of Thailand, private railway operators and the department of rail transport.

Specification

- Used for on-site inspections for damaged wheel and axle.
- Used for checking train wheels.
- Used for checking the locomotive axle.
- Used to inspect wheels and axles made of carbon steel.
- Used for consideration to send in-depth analysis in the laboratory.
- Used as a comparative reference when performing in-depth analysis.
- For use by trained and assigned staff only.

Detail work

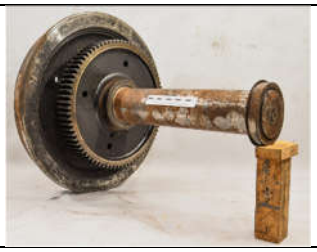
The two editions of the Work Instruction for Failure Analysis of Railway Wheels and Axles include: objectives of establishment of the manual, scope, definitions, duties, responsibilities, procedures, operational procedures, references and forms. These manuals suitable for collecting on-site data after a component failure event. Follow the instructions and procedures in this manual will allow material evidence that can be used to identify the causes and factors of railway wheel and axle damage to a systematic record. Thus, the standard manual will reduce the likelihood of operational errors in the upstream stages of the failure analysis process. For an in-depth analysis to determine the causes of railway wheel and axle damage can refer with the guidelines and methods of practice in the 3rd edition of the manual, which contains an introduction, damage of wheels and train axles, failure analysis procedures and case studies of railway wheels and axles both domestically and internationally.

Conducting a tire wheel and axle damage analysis as stated in the manual will help to be able to know the root cause of the damage, solve the problem of damaged parts systematically and reduce the risk of damage that will occur. Furthermore, it also leads to the selection of quality parts, the selection of the appropriate test-verification method, and to the further development of automated inspection technology for railway wheel and axle.

Guidelines for utilizing the work

- Provide training, recommend and convey the use of the working manual for failure inspection of wheel and axle damage during service and the department of rail transport.

  Expansion of knowledge for the development of automated inspection technology of wheel and axle.

	
Damged wheel	
	
Damaged axles	Trial the manual by staff from SRT.