The Improvement of the Response and the Efficiency of Railway Air Brake System by Modifying Software for Control

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The air brake system is essential for the safety operation of railway vehicles. However, the air brake system needs some operating time and air consumption for propagating compressed air through the pipe and filling the cylinder with it. We consider that a more efficient system will have large advantage for safety, robustness, reducing energy and laborsaving for maintenance etc. In this study, therefore we proposed a new method for reducing the operating time (called response time) for supplying the compressed air by controlling wheel slide protection (WSP) dump valve installed in the recent railway vehicles. In addition, we tried to reduce the air consumption of the air braking with a focus on the case where the WSP system is applied. Furthermore, we verified the advantage of the new approach by a real railway vehicle and by a hybrid simulation method etc. As a result, the proposed method reduced the operation time and the air consumption and improved the braking performance.