

**Development of Lifetime Evaluation Method for Electronic Interlocking Equipment
in Consideration of Usage Environment**

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With regard to the electronic interlocking equipment introduced in the latter half of the 1980s, the time to replace a large portion of the equipment introduced in the early stage has come, and since the labor and economic burden required for the replacement is larger than that of other signalling facilities, technical development of life-time elongation is required for the purpose of leveling the burden. In this research, the authors developed a lifetime evaluation method to be applied to the periods of deterioration progression with time based on the redundancy configuration and the occurrence records of faults excluding disturbance of electronic interlocking equipment. In this method, based on the reliability test data collected by the parts supplier, the electronic parts that most contribute to the equipment life are identified by the use of the acceleration model for each part and with consideration on the environment in which they are used. Additionally, because it covers the wear failure period, the authors decided to treat the life-time of the specified electronic parts as the equipment life. By applying this method to the electronic interlocking equipment for small stations, the authors were able to identify the electronic parts in which the fault appears first in the equipment and to present the change of the failure risks with time.