KAWASAKI STEEL TECHNICAL REPORT
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Finishing Mill Tension Control System in the Mizushima Hot Strip Mill

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Synopsis :
At the Mizushima hot strip mill, the tension control system in the finishing mill was replaced to improve dimensional accuracy of strip. In latter stands, conventional loopers were renewed to low-inertia electric loopers with a tension measuring device. The control system has not only a looper height control function but also a strip tension control function, and is constructed as an anti-interference system of these two functions. In former stands, a looperless control system was introduced without new loopers. A direct digital control system was also applied for improving control accuracy. As the result of this refreshing; good operational performance has been achieved, for example, in width accuracy, we have reduced excess width by 2.5mm.

The body can be viewed from the next page.

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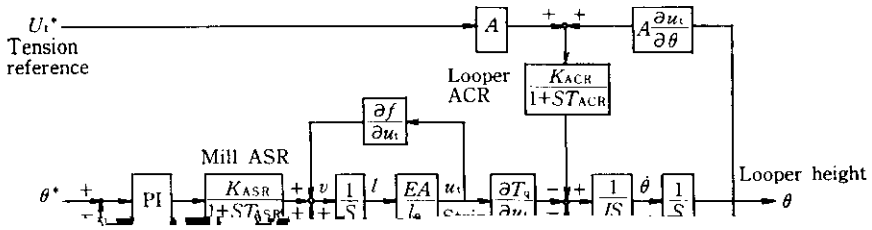
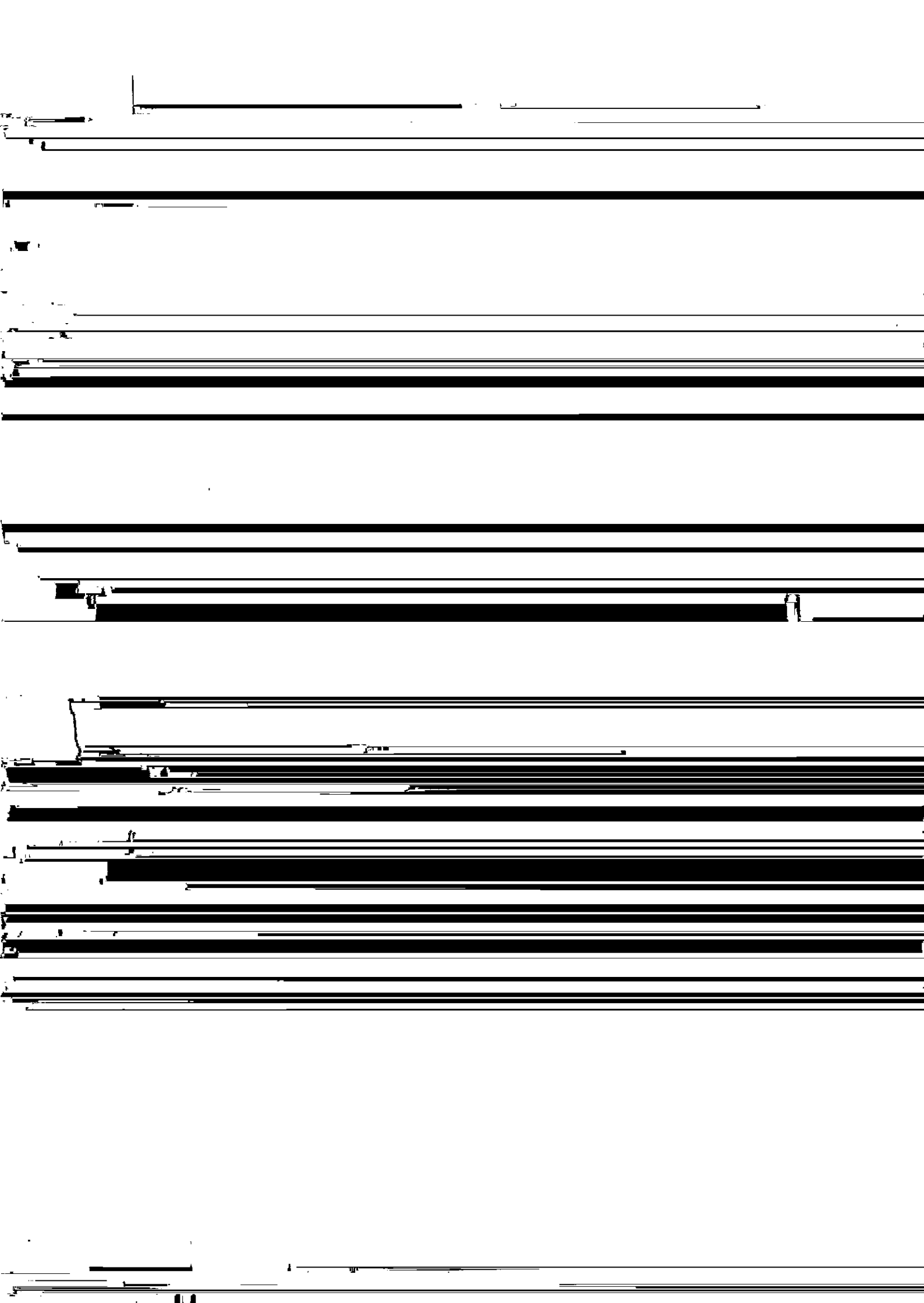


Fig. 1 Block diagram of looper system (conventional type)

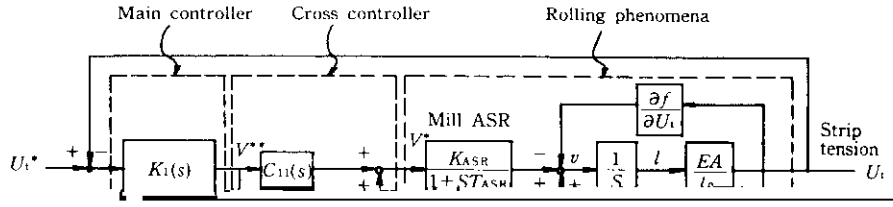
In this conventional system, tension is controlled by [illegible] the looper height, and this, combined with corrections of the inertial forces of the rolled strip and loopers by using the output of an accelerometer. From



New electric looper

● : Measured

3 Modification of Finishing Mill Tension Control System


Main controller
Cross controller
Rolling phenomena
Mill ASR
Strip tension

[redacted]

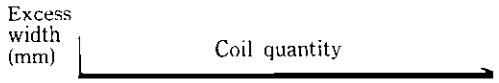
the No. 1 and No. 2 loopers. **Figure 13** shows an example of a control chart recorded during actual looperless rolling.

Figure 15 shows the distribution of average excess width of finisher delivery, before and after the modification of the looper system.

(3) Strip width accuracy improved since the tension disturbances which affect strip width diminished. **Figure 14** shows an example of the charts of the finisher delivery width meter before and after the modifications.

(4) Due to the development of actual tension control, i.e., the introduction of finishing mill AWC (automatic width control) for adjusting the tension in accordance with the deviation of the finisher deliv-

(5) As regards the improvement of strip thickness accuracy, in the Mizushima hot strip mill, the F_5 to F_7 stands were replaced by the 6 high HC mill in September 1983, and at the same time hydraulic screwdown AGC was introduced; thus, improvement in strip thickness accuracy in both the strip width and strip length directions was achieved.[13] The prior modification of the tension control system substantially contributed to the improvement



This system will be employed in the hot strip mills of both the Chiba and Mizushima Works, and will hope-