

KAWASAKI STEEL TECHNICAL REPORT

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Progress in Equipment Diagnosis Techniques at Kawasaki Steel Corporation

Akira Ichihara, Satoshi Kasai, Hiromasa Yamamoto, Masafumi Tanaka, Hiroshi Fusegawa, Yushi Miyake

Synopsis :

This paper reports on the development and application of Kawasaki Steel's equipment diagnosis techniques. The equipment control in the iron and steel industry, where production heavily depends on equipment performance, has been changing largely in the form of modernization of equipment with a view to cope with highly sophisticated quality control and multifarious production. In terms of assurance of equipment for desired production, an equipment control technology backed up by engineering has been more strongly demanded. Developed to bring the capacity of equipment into full play are the machinery/equipment diagnosis techniques used as predictive maintenance and process diagnosis techniques for product quality assurance. The above two techniques are being further developed into an equipment control system techniques. Since there are many phases where human judgement is needed, attention has been paid to the role of human support for highly efficient and sophisticated maintenance work in order to establish an equipment diagnosis techniques.

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Progress in Environment Diagnostic Techniques

sis judgment, and evaluation, and (5) education and training of key personnel who can pass high level judgment in equipment control

equipment performance by keeping the accuracy of equipment.

At its initial stage the role of equipment mainte-

This paper describes the development and application

nance was limited to maintaining and, when possible, improving the equipment in performance and function

ment of basic techniques and also presents at levels suited to the existing production and operation

stable production of high grade products (Fig. 1 "Direc-

2.2 History of Equipment Control and Diagnosis

clarify the failure mechanism, to predict abnormalities and to develop forecasting techniques. For the latter, passing judgment based on reliability engineering.

Table 2 Diagnosis techniques at Kawasaki Steel

Items	1970's		1980's	
	2nd half		1st half	2nd half
Development of diagnosis technique for failure prediction	<ul style="list-style-type: none"> • Diagnosis of roller and motor by vibration method • Crack depth measurement • Stress analysis of structure • Insulation diagnosis of high voltage 	<ul style="list-style-type: none"> • Diagnosis of low speed rotating machine • Diagnosis of oil film bearing by AE method • Analysis of gas pipe corrosion 	<ul style="list-style-type: none"> • Diagnosis of chimney and torpedo car by thermoview • Diagnosis of hydraulic valve by vibration analysis • Diagnosis of hot-run roller by 	

Table 3 Major items in on-line diagnosis systems

Plant	Sintering Plant	Blast Furnace	Continuous Casting Machine	Hot Strip Mill	Continuous Pickling Line	Tandem Cold Rolling Mill	Continuous Annealing Line
Item	Blower pump	Roll-ace device	Lubricant system	Mill drive	Lancer	Mill drive	Heater roll

