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KAWASAKI STEEL GIHO

Vol.33 (2001) No.1

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"Maintenance Revolution", Developed Machinery Maintenance Technology in Steelmaking Plant Pointing at the 21st Century

x m ° I (Takafumi Takimot) WÆG @T (Nobuo Ogasawara) v ®, V (Hiroshi Horyoda)

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Synopsis :

In iron and steel industry, which is composed of equipment in large scale, equipment maintenance technology is a significant fundamental technology of exerting an influence upon the operation efficiency of the equipment. This report firstly summarizes the trend of the equipment maintenance technology developed by Kawasaki Steel. And herein subsequently described is "maintenance revolution" of aiming at significant developments in maintenance technology for mechanical equipment, which has been initiated for the purpose of constructing a basis for securing unshakable high profits for the iron and steel industry under the recent business management environment. The "maintenance revolution" is an activity with the intention of establishing a new equipment maintenance technology, which is more efficient than the conventional ones, by developing and organizing in-company individual technologies comprising arts in search for appropriate machine elements, machine materials and equipment diagnosis applicable to respective equipment condition in use in the iron and steel industry. In this paper, developments and the perspective of equipment maintenance technology in the future are also discussed by citing examples.

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21世紀の鉄鋼生産を支える機械設備の保全技術 「保全革命」*

川崎製鉄技報
33 (2001) 1, 1-5

**“Maintenance Revolution”,
Developed Machinery Maintenance Technology in Steelmaking Plant**
Revised at the Plant

- (1) Quantitative monitoring on machine conditions
(Vibration, temperature, torque, etc.)
- (2) Severe control of machine accuracy
- (3) High reliability
Mechanical parts

Table 2 Theme of maintenance revolution

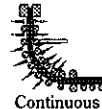
Maximize total operation hours	(1) Reinforce of mechanical parts (2) Counter-measure to severe
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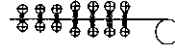
Blast furnace



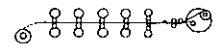
Converter



Continuous caster



Hot strip mill



Cold strip mill

	Ironmaking	Converter	Continuous caster	Hot strip mill	Cold strip mill
Temperature (°C)	1 500	1 500	1 200	1 000	200
Speed (m/min)			2.5	1 680	2 800
Environment	Dust	Dust, moisture	Dust, scale, water	Scale, water	Oil, water
Damage mode	Heat, wear corrosion	Heat	Heat, corrosion	Heat, impact seizure	Slip, seizure wear

Table 4 Developed technologies to prolong service life

Process \ Deterioration	Ironmaking	Steelmaking	Hot strip, plate, shapes	Cold strip
Vibration	Non-loosening nut			
Fatigue	Seal valve		In-company developed UJ spindle	Blister resistant rubber lining
Water		Heat crack resistant, corrosion resistant, and wear resistant material		
Heat			Functionally graded multi layered overlay	

Molten scale reactivity

MnO build up

