

KAWASAKI STEEL TECHNICAL REPORT

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Information Systems

Scientific and Engineering Computation System at Kawasaki Steel

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Synopsis :

At Kawasaki Steel, a scientific and engineering computation system has been developed, from the earliest utilization of management science, through its applications ranging from the heat transfer analysis, structural analysis and control system to the analysis of a large scale model by supercomputer such as the fluid flow analysis. This paper describes the features of main applications which include the heat transfer analysis of blast furnace hearth, molten metal flow analysis in the continuous casting mould, stress analysis of the work roll shift mill, and simulation of hot tandem mills. The scientific and engineering computation system was developed on the basis of FACOM VP-50 supercomputer by using the corporate network. Additionally, a user supporting system which was very powerful and useful in the scientific and engineering computation was developed, and it is also summarized here.

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The body can be viewed from the next page.

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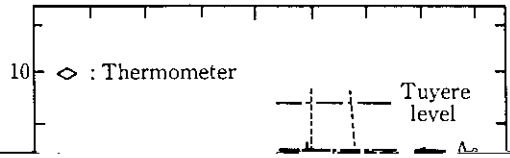
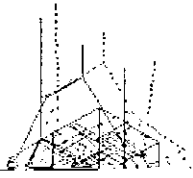
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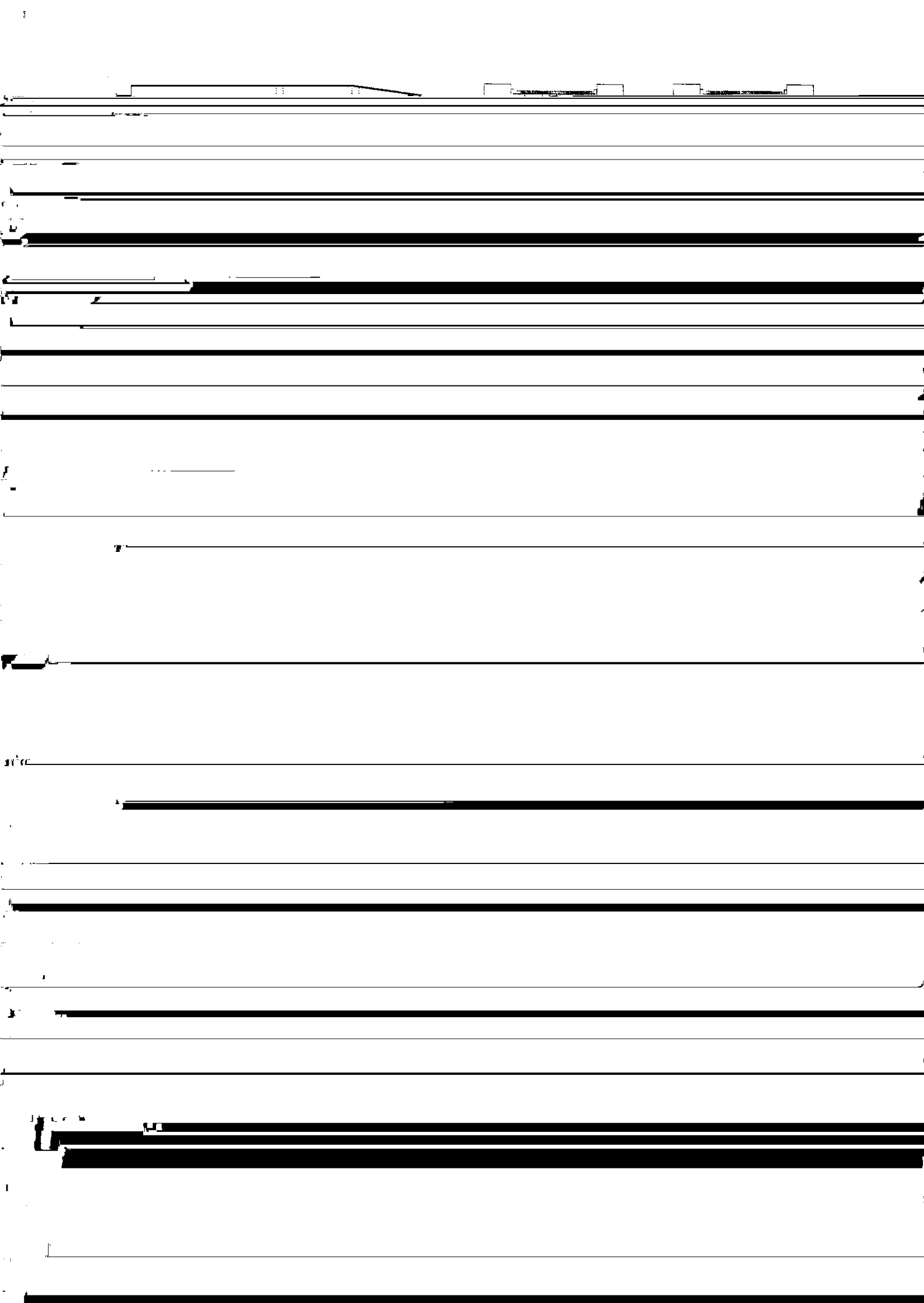
of scientific and engineering computation systems to

Table 2 Application software

Table 3 List of typical application examples

External software	Internal development	Iron making	Steel making	Rolling
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The melting loss in actual steel ingots and the melting loss generation conditions obtained by calculation show good agreement. The results of this analysis of non-melting loss conditions of cast material have been

uct defects, and has been actively used for the modification of facilities and set-up of operating conditions.

Since this analysis involves large-scale computation, a super computer is used and extensive vectorial tuning is

incorporated into the operational factors used in the manufacture of clad steel ingots.

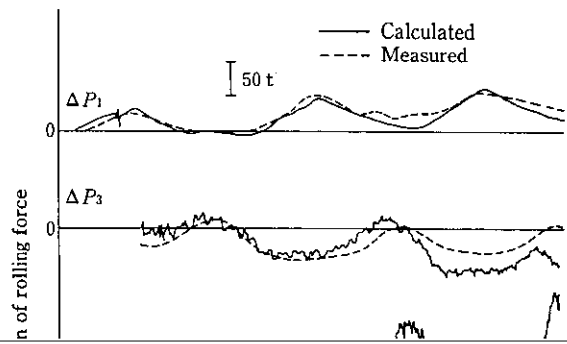
carried out.

3.6 Analysis of Roll Strength in Work Roll Shift Mill

causes of roll cracking, but also to obtain important design data for determining roll specifications and mill specifications for new facilities.

3.7 Simulation of Non-Steady Phenomena in Hot Tandem Mill

The operation of the hot tandem mill requires various control systems for strip thickness, especially at the strip ends, strip thickness changes during rolling, and looper control for minimizing the variations in tension between stands. To examine these control requirements



MT UNIT
2 sets

DISK
20 GB

FACOM VP-50
OS (MSP, VPCF)
Main memory 64 MB

FACOM
VP-50

FACOM
VP-50

With this system, peripheral knowledge, such as the job control language necessary for performing scientific and engineering computation, is no longer needed. Further, the fields supported and types of application software have become varied and complicated, but enquiries from users and utilization assistance can be effectively processed.

Types of scientific and engineering computation appli-

however, many events cannot be adequately rendered in quantitative form, and decisions are based on experience. In the future, when operational techniques are to be improved, it will be necessary to base models on experience. The technology for this includes AI and fuzzy logic.