The conclusions obtained from the experimental test results wre as follow;

1) Transition curves of dynamic fracture toughness shifted to a higher temperature, and transition curves were change in narrower temperature range abruptly as higher impact loading rate.

2) Transition temperature $T^{d}_{\delta}(0.2)$ or $T^{d}_{J}(10)$ based on the dynamic COD or J-value criteria respectively were almost constant or slightly increased to higher temperature with higher loading rate.

3) The difference of transition temperature between the static and dynamic fracture test was large in the bending fracture toughness test comparing with the tensile test.

4) The dynamic COD or J-value criteria in this test represented a favourable critical toughness of the structural steels depending to test temperature.

<P. 441>

Yield Phenomena of Filler Metal at Brazed Butt Joint under Micro Shear Stress
—Mechanical Properties of Brazed Joint (III)—

by Ken Sasabe and Isao Okane

This paper discribs micro deformation of filler metal at brazed butt joint under pure shear load. We measured static torsional deformation of butt joint of two types of carbon steel and pure iron brazed with pure copper.

Filler metal at brazed joint proved to have a certain yield stress which was not simply related to the joint clearance and the strength of base metal. The experimental results have good agreement with the theoretical presumptions.

<P. 566>

Three Dimensional Cold bending and Welding Residual Stresses in Penstock of 80 kgf/mm^2 Class High Strength Steel Plate

by Yukio Ueda, Keiji Fukuda, Iwao Nishimura, Hideaki Iiyama, Naomichi Chiba and Minoru Fukuda

In the process of fabrication of large size penstock, thick plate is used and cold bending and welding are applied. The resulting residual stresses should exhibit complex three dimensional distribution. These residual stresses should influence brittle fracture and fatigue strength. Therefore, it is worthwhile to measure these residual stresses as accurate as possible.

The authors presented the new measuring principle based on the theory of inherent strains and developed several measuring methods for three dimensional residual stresses, which were very accurate, judging from the theory of elasticity, although some approximate methods such as Rosenthal-Norton Method have been used so far.

In this paper, the authors develop a new measuring method of residual stresses due to cold bending. For actual measurement, a large size model of penstock of 80 kgf/mm^2 class high tensile strength steel plate is fabricated. Residual stresses due to cold bending are measured in the shell plate. Welding residual stresses at the longitudinal and circumferential weld joints are measured by the method which the authors presented before. It is observed that the maximum residual stress is about 50 kgf/mm^2 to 60 kgf/mm^2 which is less than the yield stress of the material.

<P. 570>

Effects of V on the High Temperature Properties for the 308 Type Stainless Steel Weld Metals

by Takashi Zaizen, Shiro Aoki, Shiro Inoue and Katsumi Suzuki

The effects of V on creep rupture properties and high temperature mechanical properties of 308 stainless steel weld metals for use of the welded joint of pipe and vessel in the fast breader reactor are investigated and the results obtained are sumarized as follows.

1) Tensile strength and rupture elongation of 308V weld metal almost coinside with those for SUS304 stainless steel in the temperature region between 500°C and 600°C.

2) Under certain circumstances the creep rupture strength and creep rupture elongation of 308V weld metal are higher in comparison with those for SUS304 stainless steel.

3) High temperature tensile properties of 308V weld metal are almost same as those for 308 weld metal, on the other hand creep rupture strength and creep rupture elongation of 308V weld metal are higher as compared with those for 308 weld metal.

4) Superior creep rupture properties of 308V weld metal as compared with those for 308 weld metal are caused by the following factors.

i) V contents in the austenite matrix of 308V weld metals are three and a half times to five times as mutch as that of 308 weld metal.