## 2. Main Equipment of JWI-CIF<sup>2</sup>

Verification of integrity by experiments using fullscale structures that approximate actual structures is indispensable. The general practice is to conduct a fracture mechanics evaluation using the properties obtained by a small-scale test. However, this fracture mechanics approach is based on the results of extensive e8fnj 65 >> BDC 0 Tc 0.017 Tw 0 -1.33 TD [(man)40 (y ne)14 (w pr)34 (oducts including steel pla)29 (tes f)40 (or steel pla)29 (tes f)40 (tes Using this equipment, it is possible to perform brittle fracture experiments by applying loads equivalent to those of actual ships to large-scale heavy steel plate \$ Deiginalansvalindrectinual steller s mainly used for full-size fracture tests (large-scale structural model tests, ultra-wide duplex ESSO tests,

etc.) in which the specimen size exceed900mm.

The JWI-CIF<sup>2</sup> also has a 20MN and 12 MN tensile testing machine, which are mainly used for tensile test ing relatively small specimens, approximately 500mm in size. The type of test is, for example, the deep notch test (brittle fracture initiation test), ESSO test (temper ature-gradient type brittle fracture propagation/arrest test), CAT test (isothermal type crack arrest test), etc.

In the line pipe field, evaluations simulating the var ious risks that can occur through the time of pipeline construction to the service period are necessary. For example, in buried pipelines in seismic hazard zones, buckling or rupture of the line pipe is possible due to large permanent ground deformation accompanying liquefaction or landslides. In order to evaluate integrity against fracture under those conditions, the JWI-CIF developed a large-scale pipe bending machine which

propagation/arrestability of heavy plates and welded structures, mainly for the shipbuilding field. Even if a brittle crack initiates in the hull and propagates over a long distance, it is necessary to prevent catastrophic destruction by stopping, i.e., arresting the crack during propagation in the middle of the hull. For this reason, the arrestability of brittle cracks is extremely impor tant. Because the steel plates used in the tops of eon tainer ships have been getting thicker and recently reached 100mm, a large test load caacity is required in tensile testing machines. Moreover, since the distance between the two loading pins is as long as 110, stress waves generated at the time of brittle crack initiation can be prevented from interfering with the test specimen, so that the arrestability of long brittle cracks can be evaluated under the same conditions as in actual ships. JFE Steel is contributing to the safe navigation of ships by the development of a structural arrest tech mo6 (s(b)2ID n lw 53.8o time0-hh)5 6 ID n .4 (v)0.5 (ig)0.5 (a)29.4 (t)0.5 (io)312.5 (can )]T02USc8 /Span <</LangID 278 >

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