ABSTRACT

Steel Ballast pipe used in ship building constructions which generally are made from steel. Steel pipe expected to have long age (± 25 year). But in reality, many things able to influence the material age. One of them is welding that easy to get corrosion that effect of existence residual stress. This matter because of the material put hand to corrosive medium able to be ascertained will result damage in its structure so that later will get failure of structure and affect on pipe age.

Examinations at this research are conducted at low carbon ballast pipe ASTM SA 53 which have welding process, post weld heat treatment process, and slow cooling rate which conducted with variations of temperature, temperature that used are 26 C, 600 C, 650 C and 700 C with holding time 60 minute. Then examinations of photo micro, corrosion rate, photo macro and hardness test is also conducted. three electrode Cell with Nacl electrolyte used in examination of corrosion.

Result of examinations indicate that in each test specimen get change of corrosion rate value and its hardness value. After four times test got temperature 700 C have the minimum value of corrosion rate 0.05234833 mmpy with average hardness value in BM = 104.046 kgf / mm2, HAZ = 88.199 kgf / mm2, WM = 119.295 kgf / mm2 while maximum corrosion rate at temperature 26 C equal to 0.11841397 mmpy with average hardness value in BM = 97.633 kgf / mm2, HAZ = 103.234 kgf / mm2, WM = 145.707 kgf / mm2. This results are obtained base on corrosion rate value and minimum hardness value that give addition pipe age equal to 11 year.

Keywords : PWHT (Post Weld Heat Treatment), Steel Pipe ASTM SA 53, Photo Micro and Photo Macro, Three Electrode Cell, Hardness test, Corrosion Rate.