

N160. An Update On The Mechanical Stress Improvement Process

The Mechanical Stress Improvement Process (MSIP) has been developed to combat Intergranular Stress Corrosion Cracking (IGSCC) which has long been recognized as a problem in BWR piping systems. IGSCC is brought on by tensile stresses in weldments which are sensitized in the presence of reactor water. MSIP eliminates these tensile stresses, permanently protecting the weld.

MSIP has a 100% successful performance record since its first application in 1986. Protected weldments have shown no new crack initiation and pre-existing cracks have been arrested. Analysis confirms that MSIP arrests cracks up to 55% through the wall. It has also been shown to be extremely useful in protecting nozzle weldments which suffer from stress corrosion cracking.

The need for piping replacement can be avoided by early application of MSIP. This can save utilities approximately 200 person-mSv (20 person-rem) per weld. For U.S. plants, this will also reduce the required inspection frequency, resulting in shorter outages and further dose reductions. Electric Power Research Institute (EPRI) data on MSIP application at Commonwealth Edison shows a \$430 million savings by avoiding pipe replacement.

Taken from "Bringing Longer Life to LWR Pipe: Update on MSIP," Jan S. Porowski and Manu L. Badlani, Nuclear Engineering International, pp. 40-42, July 1992.