

N279. Lasers Make Light Work of Sleeving

Laser welded sleeving was performed for the first time in the United States in April 1992, followed by a larger campaign in October 1992. These successful projects, as well as demonstrating the field hardiness of the laser equipment, showed that laser sleeving offers a degree of process control not found with other methods and produces welds that can be fully inspected by ultrasonics. A further application is expected in March 1994.

The use of laser welding for sleeve installation promises several advantages over current methods, which include the mechanical or hybrid expansion joint, tungsten inert gas welding, and explosive welding processes. Some of the advantages of laser welding are:

- It provides a hermetic seal.
- It addresses primary water stress corrosion cracking (PWSCC) as well as outer diameter stress corrosion cracking (ODSCC) mechanisms.
- It is insensitive to secondary side condition such as moisture and surface emissivity.
- It is tolerant of field variability in sleeve/tube fit-up.
- The focused application of energy results in smaller heat affected zone, lower heat input compared with current fusion welding methods, less distortion, and greater control of weld quality.
- The gradual sleeve hydraulic expansion process minimizes parent tube distortion.
- Repair welds can be made using the same process parameters as the initial weld.

The successful field implementation of laser welded sleeving has proven the feasibility of the process for repairing steam generator tubes and enhancing plant performance.

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