

## Surface Mitigation

### Surface Peening

Both Water Jet Peening (WJP) and Laser Peening (LP) are recognized in the industry as some of the most successful surface mitigation techniques available. WJP has been applied to both Pressurized Water Reactors (PWR's) and Boiling Water Reactors (BWR's) in Japan over the past 10 years. LP has been applied extensively in the commercial aerospace industry for the past 11 years.

Both EPRI and ASME have included both of these technologies in their evaluations and ultimate code case submission.



### How Peening Works

WJP utilizes high speed water jet flow with numerous cavitation's generated by its uniquely designed nozzle(s). The cavitation in the water jet collapse near or on the metal surface generating an intensive pressure wave as a result of the collapse. This results in reducing the residual tensile stress and puts the surface and near-surface layer in high compression thus mitigating it from stress corrosion cracking (SCC).

With LP, a laser beam is imaged onto the surface being mitigated. A thin layer of de-ionized water, which acts as an ablative layer, is also flowed over the same surface. Upon firing of a laser pulse, the intense electric field of the high power laser ablates material at the ablation layer creating a plasma which results in a pressure wave that creates a deep compressive stress layer.



### Features

- Neither technology alters the shape or dimensions of the component being mitigated
- WJP can be utilized both in vessel and on certain components in air (such as the vessel head)
- LP provides the deepest compressive layer of any technology currently offered
- Neither technology introduces foreign material or utilizes any abrasives
- Both technologies are implemented using experienced and proven teams

### Benefits/Differentiators

- Long term mitigation from SCC
- Proven technology
- Reduced risk by employing the original technology developers
- LP has commercial Federal Aviation Administration (FAA) and European Aviation Safety Agency (EASA) acceptance
- WJP is certified by the Japan Power Engineering and Inspection Corporation (JAPEIC) and incorporated into the Japan Society of Mechanical Engineers (JSME) code.

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