



SNUBBER OPTIMIZATION PROJECT

As a means to absorb abnormal dynamic loadings and minimize undesirable pipe displacements; devices commonly referred to as shock and sway suppressors, shocks, or simply snubbers are often incorporated into the restraint scheme for high energy piping systems. Snubbers also represent telescoping products that are not intended to interfere with ordinary thermal expansion, or contraction, and are thus useful at locations experiencing substantial thermal movements.



Replacement Snubbers

In addition to the performance of regular walkdown activities directed at pipe supports, restraints and snubbers, OST Services has performed a number of unique and major projects over the years. The following represents a brief description of a notable undertaking.

PROJECT DETAILS

Two major 450 MW coal burning generating facilities were experiencing continuing problems with the supports and snubbers utilized along their high energy piping systems. Inspections revealed that a considerable number of snubbers were deficient.

Furthermore, in this instance the original mechanisms represented mechanical snubbers that are prone to "closed" type failures, whereas the devices can actually lock up and act as struts or thermal restraints, evidence of which existed at a number of locations.

OST Services was awarded the project to upgrade the restraint control scheme, specify replacement products and supervise their installation.

The basic approach involved a considerable planning process which focused on the situation and the development of a cost effective means to optimize, enhance and improve the circumstances. Objective evaluations included turbine trip out loads, seismic disturbances, safety relief valve blow down and wind loads. All related piping systems were analyzed for a potential

reduction in the number of snubbers that would be applied along with the affects that suspected inoperable snubbers would have on the pipe stress levels.

Ultimately, the work resulted in the removal of 82 mechanical snubbers which had been applied as the original restraint scheme.

The replacement restraint scheme involved 39 hydraulic type snubbers and 12 rigid sway struts.

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- **First, a dedicated effort was initiated to upgrade the restraint scheme incorporated into the original design. The work involved a determination of the number of snubbers required based upon objective engineering. In other instances, it was demonstrated that some of the snubbers could be converted to rigid struts.**
- **Second, the snubber locations that remained were converted from the mechanical type to those utilizing hydraulic fluids.**
- **Third, replacement pin-to-pin considerations involved the supply of material with “drop in” characteristics versus those that would require the removal and realignment of brackets, extension pieces, etc.**
- **Fourth, nondestructive examinations were directed at various locations along the critical systems that were identified as high stress locations or those prone to degradation based upon existing conditions.**

GENERAL DISCUSSION

The care, maintenance and ultimately the reliable performance of a high energy piping system are dependent upon a number of categories. Factors such as the performance of pipe supports are crucial to accommodating dead weight loadings and allowing unobstructed thermal expansion of the systems.

The restraint control devices, or snubbers, are intended to telescope freely and absorb only the dynamic loadings that may tend to develop within a system.

Periodic inspection of these devices provides crucial information on this area as well as identifying instances where abnormal operating occurrences may have developed along with unpredicted stresses.

Also, important to the process is the periodic application of various non-destructive testing techniques at selected locations along the piping systems. The areas can be prioritized based upon industry experiences, site specific issues, along with objective engineering evaluations.