#46-1

Over Tightening Hanger Fasteners

Is Poor NFPA 13 Craftsmanship

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The NFPA 13 hanger support function is guaranteed by proper hanger installation and assembly of all its components and fasteners. A hanger is the sum of its components, with the weakest defining its ability. In most instances these weakest components are the fasteners of the hanger. Over tightening any fastener in a hanger assembly is problematic and poor craftsmanship. Accordingly, improper fastener assembly can jeopardize the required mechanics of the NFPA 13 system hanger.

In my opinion, sprinkler system fitters use of impact drivers is inappropriate for proper NFPA 13 hanger installation. Fitters are putting to much emphasis on ease and speed of hanger installation rather than installation quality. The "brute nature" of impact drivers, while desirable for drilling or disassembly, conflicts with their utility for tightening. Impact drivers propensity to over tighten makes them a dangerous multiplier of leverage.

Over tightening of fasteners produces 3 categories of subject hanger failure. Obviously, the first is over tightening the hanger mounting fastener. This induces failure due to deformation, shear or tear of both its threads or those of the building structural element to which it attaches.

The second class of failure involves over tightening phenomena within the hanger assembly. This imparts a jack screw effect causing incredible force on hanger component parts. This force can exceed the design ability of castings, flanges, threads and even the fasteners head. Open hanger component architecture, be it hook or jaw, is particularly susceptible to flexure due to excessive axial moment point load.

The third class of failure involves the building structure itself. Engineered building structural elements are susceptible to stress, deformation or damage by excessive torque loading produced by fasteners that engage them. The resultant deformation due to bending, tear, fracture or flexure may produce permanent metal fatigue.

In summation NFPA 13 defines proper hanger installation by using descriptive wording such as fully engaged, proper and snug to define correct fastener application as neither too loose nor too tight.

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