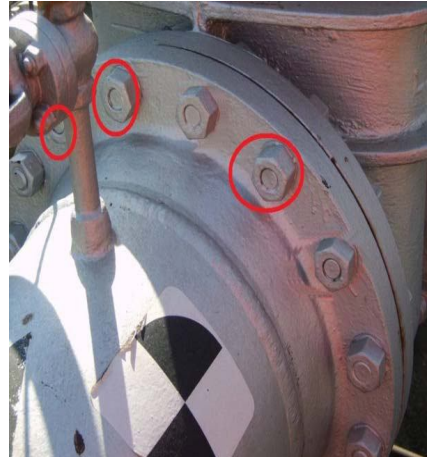
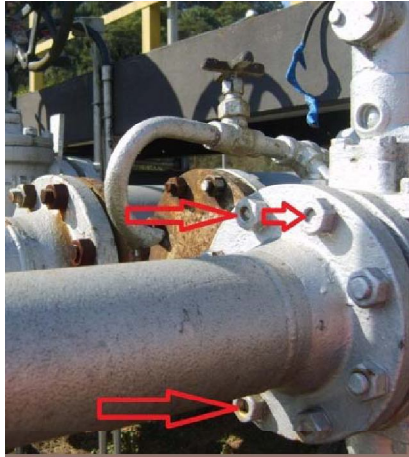


Mechanical Integrity – The Bolts Are Too Short!



The pictures show improperly bolted flanges that a plant found during safety inspections. In the top pictures, some or all of the bolts are too short, and the nuts are not completely on the bolts. This means that the joint may not be as strong as it should be. Flanges are designed so that the entire nut-bolt combination holds the forces on the flange. If the nut is only partially screwed onto the bolt, the connection may not be strong enough. In the picture to the left, two of the four bolts are missing. This flange will only be about half as strong as the piping designer intended!

What can you do?

- Remember that the job is not complete until all of the bolts are properly installed and tightened.
- Make sure to follow the correct procedure, use the correct tools, and that you are properly trained in the equipment assembly procedure.
- Check pipes and equipment for properly bolted flanges as part of plant safety inspections. As simple guidelines, bolts that do not extend beyond the nuts should be reviewed by a plant piping craftsman or engineer.
- If observe improperly bolted flanges report them so they can be repaired, and make sure the required repairs are completed.
- Inspect new equipment, or equipment which has been re-assembled after maintenance, to make sure it is correctly assembled and properly bolted before starting up.