Experimental Analysis on Development of Tool Holder for Chamfering Bend Tubes

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***Abstract*:- In our project work we are going to discuss about chamfering of bend tube portion in super-critical burner panel assembly which is one of the components of boiler.In burner panel there are several tubes and they are in several planes. only the tubes in horizontal planes can be chamfered by using a chamfering machine. If the tubes in bend planes are to be chamfered a crane is required to hold the burner panel. And there some disadvantages occur this does is implemented. so the objective is to reduce or eliminate the disadvantages.The objective is to be achieved by way of suitable changes to the tool holder in chamfering machine which enables the chamfering of tower tube boiler bend tubes.**

Keywords: Bend tubes, toolholders, Chamferingmachine, air-motor.

INTRODUCTION:

A boiler or steam generator is a device used to create steam by applying heat energy to water .It is used wherever a source of steam is required. The form and size depends on the application, mobile steam engine such as stream locomotives, portable engines and steam-powered road vehicle typically use a smaller boiler that form an integral part of the vehicle; stationary steam engines, industrial installation and power stations will usually have a larger separate steam generating facility connected to the point-of-use by piping.Supercritical steam generation is the one of the important types of steam generators. Supercritical steam generators are frequently used for the production of electric power. They operate at supercritical pressure. In contrast to a “subcritical boiler", a supercritical steam generator operates at such a high pressure (over 22.06 Mpa) that actual boiling ceases to occur, the boiler has no liquid water-steam separation.

EXPERIMENT:

BEFORE CHAMFERING PROCESS:

Establishment of grinding process for chamfering bend tubes:

In grinding process is used to chamfering the bend tubes.This process make an accurate shape,dimensions and make chamfering angels.But,We could not make an accurate chamfering for bend tubes.It make some damages like material loss,highly time required.

Damages of material:

No of end to be chamfered	720
Man hrs required	180*8=1440 hrs
No of grinding wheels required	160

Grinding process

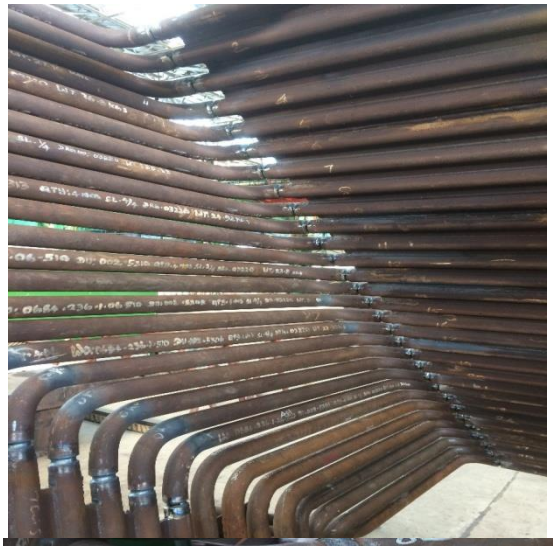
Damage of material by grinding process

AFTER CHAMFERING PROCESS:

Establishment of chamfering Method for bend tubes of tower type boliers with minimum arm length:

Tube chamfering capacity	31 mm to 76mm outer diameter
Wall thickness	3mm to 14mm
Job material	carbon steel and alloy steel
Chamfering angle	0-60 degree
Type of prime mover	air motor
Feed	Manual

For power plants using Lignite as a fuel for power generation, a separate boiler design is used. This design is called as a Tower type boiler design.Even though the boiler follows a spiral wall design similar to OTSC boilers, one major change is that the burner panels are located in the walls of the boiler instead of the corners. Hence the design of the burner panel is completely changed.There are 8 burner panels per boiler and there are around 11900 bend tubes in each burner panelThe burner panel assembly consists of 17 individual panels interconnected by bend tubes. The bend tubes are welded to the panels manually in shop.The arm length of these tubes is very minimum (ranging from 15 to 50mm). The minimum arm length required for chamfering tubes in portable end scarfer is 80mm.



Bend tubes with minimum arm length welded to the panels
Since the arm length available is minimum, it is very difficult to hold the tube in the machine. The holding devices like V-block and top clamp were modified suitably to hold the bend tubes in the machine.

HEAVY DUTY TUBE END CHAMFERING MACHINE:

The tool holders which were readily available were not sufficient to chamfer these bend tubes due to the modification done to the holding devices and also due to

the minimum arm length of the tubes. To overcome this issue a new tool holder has been developed by combining both the tool holders.

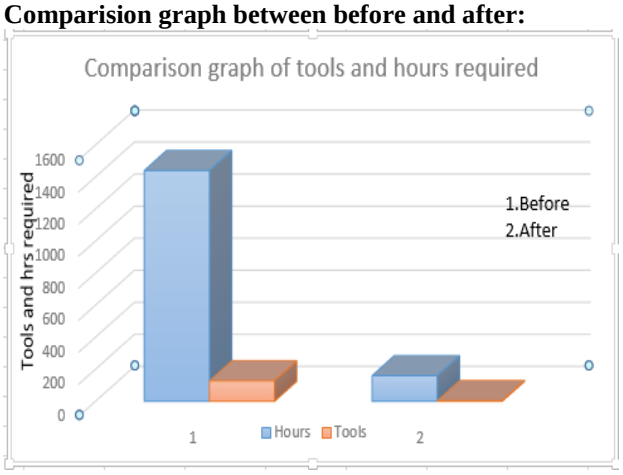
Normal tool holder *Modified tool holder*

Result and Discussions:

While using this new tool holder, the problems encountered previously were eliminated and chamfering was carried out successfully.Prior to implementation of this method, chamfering was done by grinding operation which led to lot of RT failures. After implementation the percentage of RT failures were reduced drastically and the quantum of output was also increased leading to reduced cycle time of 30%

New Tool holder used for chamfering bend tubes with minimum arm length

Comparision graph between before and after:



CONCLUSION:

Tool holder is designed with considering shape and dimension of the chamfering machine and the design is analysed.Using the tool holder,it required less time for operations.Hence the chamfering of bend tubes and portable tool holders are successfully implemented with the chamfering machine and the method is successfully installed and running in practice.

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