PLUGGING A TUBE

If a boiler tube is leaking inside the boiler and down either the front or rear tubesheet where the tube is coming out of the tubesheet then the tube needs to be re-rolled. Re-rolling equipment can be rented or loaned. If the tube is leaking somewhere between the two tubesheets, the tube can be replaced or the tube can be plugged and removed from service. It is recommended that not more than 10% of the tubes in the boiler be plugged. A re-tubing video is available on-line. Steps for plugging a tube are these:

Material required:

(2) 1.5" X 3" or 3.5" black schedule 40 nipples.
(2) 1.5" black malleable 150# threaded caps.
(1) 1.5" forged steel threaded cap (preferred) or 300# malleable cap.
(1) small tube of Loctite or pipe joint compound (pipe dope).

Procedure:

A.) Identify tube(s) to be removed by inspecting leak from inside the combustion chamber (firebox) when the boiler is full of water and under pressure and the burner is locked out.
B.) Isolate boiler from system and drain the boiler.
C.) Remove head-plates.
D.) Apply Loctite or pipe dope to the pipe threads.
E.) Twist on forged steel or 300# cap onto one end as tight as it will go by hand.
F.) Pound the cap with a mini sledge hammer to drive the nipple into the tube. Stop when the threads are just inside the tube and the "meat" of the nipple is still visible.
G.) Remove the forged or 300# cap. Re-apply Loctite or pipe dope. Screw on the 150# cap. Tighten onto threads with a 14" or 16" pipe wrench. An offset pipe wrench may be required in certain spots.
H.) Repeat at other end of the tube to complete plugging procedure.

The advantage of this method over using a solid tube plug is that solid tube plugs can be extremely difficult to remove later on when the tube is replaced whereas the pipe-cap method is very easy to flame cut and remove. If the plugged tube is along the bottom row it will be subject to radiant flame and the tube metal will disintegrate. When the burner fires, the resulting molten metal will fall down onto the burners on atmospheric boilers - or down onto the firebox brick floor on power burner fired boilers. This slag should be removed from on top of the cast iron burners as soon as possible. There is no urgency to remove it from the bottom of a power burner fired boiler box - it can wait until the next time the firebox door is opened for service or inspection.