Working inside boilers is actually covered under multiple standards. No one standard contains everything needed to be in complete compliance. The information I am providing is only a guideline; specific questions should be addressed to the Department of Labor, Occupational Safety and Health Administration.

A significant safety concern for working inside boilers is the confined space issue. This is actually addressed in two separate standards: 1910.146, Subpart J – Permit-required Confined Spaces and 1910.252, Subpart Q – Welding, Cutting, and Brazing. Individuals can be held responsible for parts of either or both standards depending on the task being performed.

Here are some steps I recommend be followed to enhance worker's safety while performing tasks inside boilers.

1) **Inform everyone who may be involved with operating the boiler that service is being performed and that the boiler will be out of service for some time.**

2) **Shut down boiler using normal shutdown procedures. Allow unit to cool to room temperature. Double block and bleed any water, steam, etc… lines that feed the boiler and/or distribute water/steam throughout the facility or process. "Double block and bleed" means the closure of a line, duct, or pipe by closing and locking or tagging two in-line valves and by opening and locking or tagging a drain or vent valve in the line between the two closed valves". Drain and vent the boiler itself.**

3) **Lockout and Tagout the fuel pump. Double block and bleed gas lines. Adequate ventilation must be provided in the work area to prevent the buildup of explosive gasses and vapors during this operation. All sources of potential ignition must be eliminated before beginning this part of the operation. Clean up any fuel leakage.**

4) **Open boiler doors and allow the space to ventilate naturally. "All hollow spaces, cavities or containers shall be vented to permit the escape of air or gases before preheating, cutting or welding. Purging with inert gas is recommended". Again, be ever vidgulent for the potential build up of flammable and explosive gasses and vapors. The work area must be adequately ventilated to prevent this occurrence. In confined spaces or small rooms, it is recommended that the atmosphere be continuously tested for explosive gasses during the "block and bleed' operation and prior to commencing work.**

5) **Ventilation is a prerequisite to work in confined spaces. Confined spaces must be ventilated using forced air prior to entering the space. The space must be test for oxygen deficiency and combustible gasses. All welding and cutting operations carried on in confined spaces shall be adequately ventilated to prevent the accumulation of toxic materials or possible oxygen**

deficiency. Entrants working in confined spaces inside a boiler shall wear a device capable of sounding an alarm in oxygen enriched, oxygen deficient or explosive atmospheres. In the event of an alarm, the entrant must immediately vacate the space and take suitable safety precautions.

6) If working in damp or wet locations, Ground Fault Circuit Interruption must be used on all electrical equipment. When performing welding or torch cutting operations, the appropriate shade safety eyewear as prescribed by OSHA shall be used (29 CFR 1910. 133). When rolling tubes, OSHA prescribed safety eyewear shall also be used.

7) Arrange for an attendant with a preplanned rescue procedure to be present outside the boiler at all time while the entrant is inside the unit. The attendant must be capable of putting the rescue plan into operation to quickly remove the entrant if the need arises. If life lines and harnesses are used, they shall be attached to the entrant's body so that it cannot be jammed in the small exit opening.

8) When welding or cutting is being performed in any confined space, the gas cylinder and welding machines shall be left on the outside. Gas cylinders must be secured against falling and damage. Heavy portable welding equipment mounted on wheels shall be securely blocked to prevent accidental movement. When arc welding is to be suspended for any substantial period of time, such as during lunch or overnight, all electrodes shall be removed from the holders and the holders removed from the space. When torch cutting is to be suspended for a substantial period of time (see above) the torch valves shall be closed and the fuel-gas and oxygen supply to the torch shall be closed outside the space. Where practicable, the torch and hoses should be removed from the space.

9) At the completion of the task and before returning the boiler to service, the work area must be inspected for tools and other items.