BEST PRACTICES – BOILER CHEMICAL FEED

➢ Feed <u>continuous</u> proportional to feedwater water flow. Under some circumstances chemicals may be fed intermittently – these would include on/off boiler feedwater pumping and/or intermittent makeup flow to the feedwater system. Consult with your water treatment representative if your chemical feed is not continuous to ensure the chemical application will provide reliable performance.

➢ Use stainless steel tubing for chemical feed lines. Compatible plastic tubing (such as polyethylene) may be an acceptable alternative for low pressure applications, but is less rugged and should not be used in hot water applications (>120° F). Carbon steel feed line is not preferred and in some cases not acceptable. Compatibility of plastics and elastomers with a certain product type should first be verified with the manufacturer.

➢ Use stainless steel or compatible plastic (e.g., high-density polyethylene or polypropylene) containers for batching chemicals. Compatibility of plastics and elastomers with a certain product type should first be verified with the manufacturer.

➢ If products are batch fed/diluted, dilution water <u>must</u> be softened or better quality - avoid using raw/hard water. Ideally, condensate or equivalent water is used for any dilution of a chemical added to the steam header.

➢ Neat feed of chemical minimizes chemical handling. If feeding neat, use a less concentrated product or feed into a dilution water line (in-line dilution) to avoid feed line pluggage. Use a less concentrated product if precipitation occurs during storage of a concentrated product (frequently due to excessive shelf life).

➢ Feed chemical through an injection quill – *use 316 stainless steel or special alloyed stainless*.

➢ Proper labeling and MSDS should be readily available for each product onsite. Refer to each product's MSDS for proper handling and storage. In general, each product should be stored in an area, which is temperature controlled, dry and well ventilated.

Feed point is dependent on treatment type:

➢ Oxygen scavengers - ideally fed to the deaerator storage or feedwater/makeup tank (in absence of a true deaerator) to maximize reaction time. Be careful to prevent low feedwater pH as a result of feeding acid sulfite – maintain feedwater pH >8.0. If caustic is fed to maintain pH, be careful not to over-feed caustic. Overfeed of caustic may harm copper components in the feedwater system. Over-concentration of caustic in the boiler will cause unacceptable steam purity.

➢ Internal treatments - ideally fed to the feedwater if non-phosphate, and to the steam drum if phosphate containing. Phosphate containing products may be fed to the feedwater if hardness is <1.0 ppm and there is no economizer and the product contains a dispersant.

➢ Chelant-based products <u>must</u> be fed to the feedwater after all oxygen is removed (after the pump-discharge if pump impellers are copper alloy). *Do <u>not</u>* use chelant-based treatment unless oxygen control is good (i.e., properly operating deaerator continuously providing <20 ppb oxygen).

➢ Condensate treatments - neutralizing amine products can be fed to the feedwater or steam. Morpholine-containing products should be avoided if boiler operating pressure is <50 psig. Filmer-based products are ideally fed to the steam header. Special care should be taken if a filmer is fed to the feedwater (especially ODA-containing products). Series 2370 formulations are preferred if filmer is fed to the feedwater. Series 2240 formulations can be fed to the feedwater or steam – some passivator products should be fed directly to the steam due to low thermal stability and/or volatility (volatility is a measure of the components tendency to steam distill – thus leave the boiler with the steam).

➢ Inorganic-based products (i.e., sulfite, phosphate, caustic) should not be added directly to the steam header or to water which will be injected directly into the steam header, i.e., desuperheat or attemperation water. Consult with your water treatment representative for guidance■

"Industrial & Commercial Water Treatment"

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