ENRJ International, Ltd.
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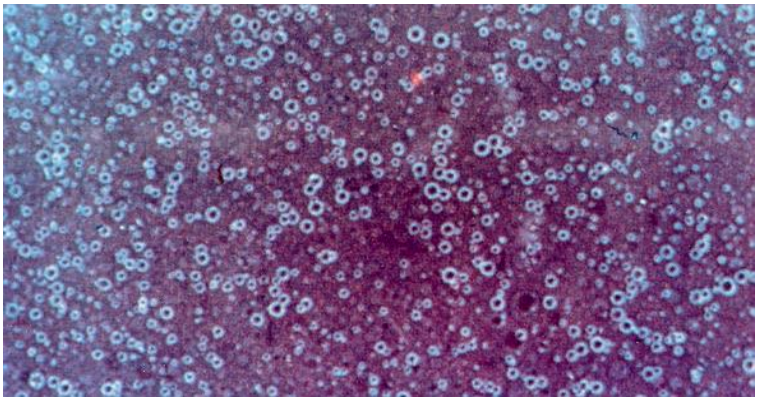
SOLUTION TO HSFO FOR BOILERS AND CLIMATE CHANGE

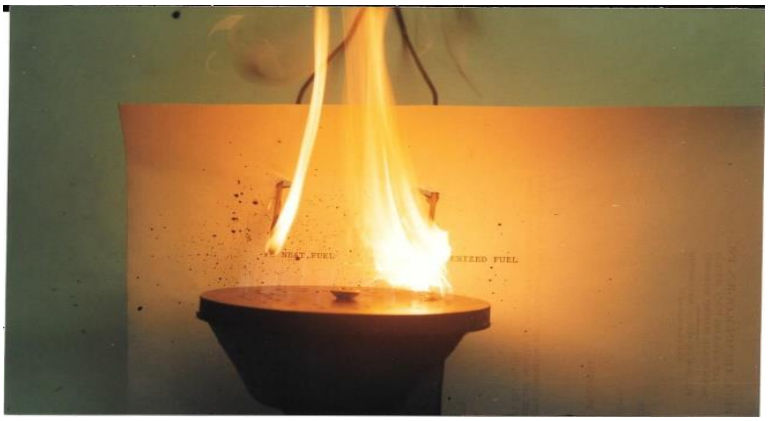
ENRJ'S patented Dual Fuel Conditioning System will reduce HSFO used in boilers up to 5%. Reduced fuel coat for a small 215 MW generating unit (1,630,000 lb./hr. boiler) is more than $5 million annually without requiring additional potable water. We return the heat from boiler blow down water back to the boiler with the use a heat exchanger using makeup feed. This is more than $200K annually, in addition to the reduced fuel cost. The reduced operating cost will support our closed loop emissions reduction system.

ENRJ's unique patented Dual Fuel Conditioning System is singular in design; custom, mature, scalable, 100% automatic, PLC controlled stand alone or it may be connected to the DCS. All system parameters are displayed on a HMI in the control room. This system is installed before the heater that will reduce fuel cost up to 5%. We have developed a process to inject a small volume of boiler blow down or potable water at inception of conditioning, controlling water droplet size at 4 to 7 microns with 100% dispersion. The micro explosions of water drops during combustion explode the fuel to a larger burning area increasing the probability of oil and oxygen colliding creating secondary atomization. Secondary atomization increases the burn out times by a factor of six and increasing burnout temperature. More complete combustion permits reducing excess air 40% to 45%. The reduced excess air increases fireside temperature above vanadium deposits melting point. Hence, boiler fireside cleaning is history, also reducing burner cleaning and soot blowing 50%. This is a mature system, having proven itself in more than 30 installations. Its foot print is 7' long, 4.5' wide and 5' in height.

ENRJ'S closed loop emission reduction system address carbon dioxide, nitrogen oxides and sulfur dioxides while present systems only address sulfur dioxide. This design is extremely efficient, using the sea water if available to reduce sulfur dioxide. The sea water is filtered and passed through a filter press to collect all solids for disposal. All water to be disposed of is treated in a holding tank before disposal.



The preceding photograph is an oil sample from a utility plant consuming 1,117mt of HSFO (215 MW) per day injecting 78 tons of boiler blow down water with the aid of a 400-power microscope. The white objects are water droplets. Fuel cost in this plant was reduced more than $5,000,000 annually. When water droplets are sized with our process they will not agglomerate, evaporate or change in size. We have samples for more than 20 years. The micro explosions of water droplets during combustion explode the oil to a larger area creating the probability of oil and oxygen molecules colliding, creating secondary atomization. Secondary atomization increases burnout times by a factor of six and increases burnout temperature.



The photograph on the left illustrates the Characteristics of regular HSFO fuel vs Regular HSFO fuel with 7% potable water injection with controlled water droplet sizes of 4 to 7 microns with 100% dispersion. Test parameters in the laboratory were as follows. The burner was 4 inch diameter using natural gas as heat source. The samples were heated to 215F (102C). One eight inch stainless steel wire was inserted one inch into sample bottles the placed above the flame. The combustion on the left is regular HSFO that burns slow producing black smoke. The one on the combustion on the right is regular HSFO with 7% potable water injection with water droplet sizes of 4 to 7 microns with 100% dispersion.

Conclusion: We have experience with boilers burning HSFO from 2 GPM to 235 GPM. However our system is scalable to any size boiler.

Contact;

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