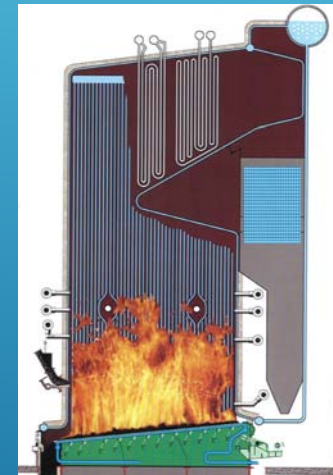


BOILER DESIGN SOFTWARE

Advanced engineering software for
heat transfer calculations in boilers

www.boilerdesignsoftwareonline.com



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Existing state of affairs

- ▶ Heat transfer calculations is first and most important step in boiler manufacturing/retrofit process.
- ▶ Rule of thumb still rules the industry resulting in less than optimum boiler design & size.
- ▶ Existing procedures rely on empirical diagrams & and assumptions.
- ▶ Dedicated calculation procedures & software mostly in-house developed with limited accuracy and universality.

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New model highlights

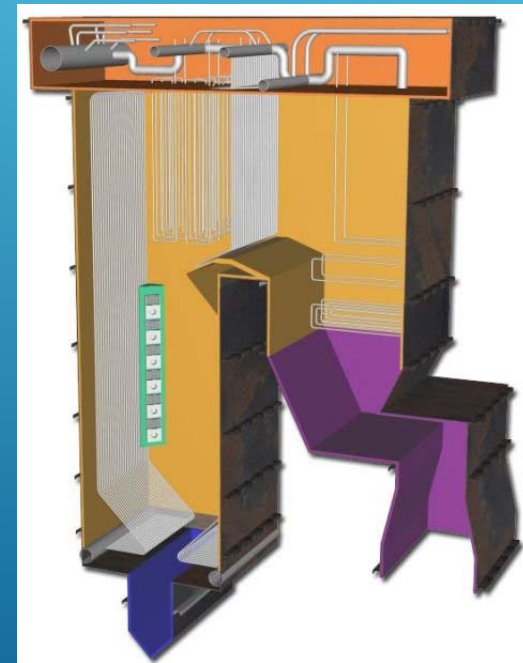
- ▶ Utilizes newly developed formula for Mean Radiant Temperature for combined flame & flue gas radiation calculation with increased accuracy.
- ▶ Waives flame & tube pitch related assumptions & diagrams in boiler furnace heat exchange calculation.
- ▶ Waives use of empirical coefficients completely.
- ▶ Applicable for all boiler designs, sizes and pressures.
- ▶ Available online with user friendly interface.

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Case study 1:

600 MW power plant coal fired boiler, subcritical

- ▶ Commissioning date: 1997
- ▶ Condition: as new
- ▶ Calculation discrepancy (steam rate):
 - data from commissioning: +5.1 to -2.5% (high load/reduced load)
 - as found: +5 to +2.7%
- ▶ Calculation time: <2-3 min
- ▶ Findings: Existence of thermal loss not shown by instruments consuming >50.000 t/year excess coal (min. 90% recoverable)

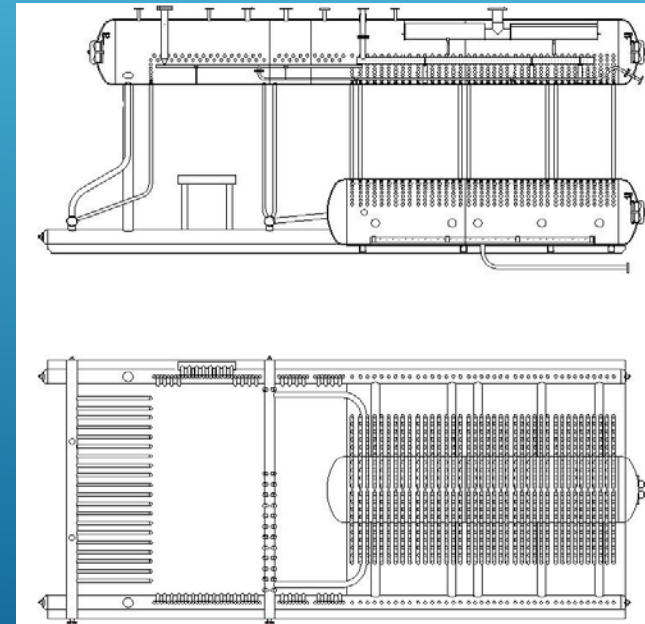


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Case study 2:

Water tube boiler with generating bank

- ▶ Condition: new
- ▶ Calculation discrepancy (steam rate): <2.5%
- ▶ Calculation time: <1 min
- ▶ Findings: Generating bank found min. 1/3rd too large. Size reduction possible without performance loss).



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Case study 3: Fire tube boiler

- ▶ Condition: new
- ▶ Calculation discrepancy (steam rate): <1%
- ▶ Calculation time: <1 min
- ▶ Findings: Tube number reduction possible from 267 to 75 without performance loss.

