Daily Boiler Log: Steam, Feedwater and Fuel

Steam and feedwater from totaliser readings, average steam and fuel rates, steam-to-fuel ratio and the feedwater not leaving as steam, for a shift or day.

Method: Totaliser differences and averages (definitions)

Input parameters

Unit system: SI

Parameter	Value	Unit
Steam totaliser, start	15,230	t
Steam totaliser, end	15,430	t
Feedwater totaliser, start	16,100	t
Feedwater totaliser, end	16,312	t
Steam totaliser roll-over value (0 = none) The reading at which the totaliser returns to zero. Enter it to handle a roll-over during the period.	0	t
Feedwater totaliser roll-over value (0 = none)	0	t
Fuel burned	33.000	t
Running hours	22.000	h

Calculated results

Parameter	Value	Unit
Steam generated	200.00	t
Feedwater supplied	212.00	t
Average steam flow	9,090.9	kg/h
Average fuel flow	1,500.0	kg/h
Steam per kg of fuel	6.0606	kg/kg
Feedwater not leaving as steam (blowdown, leaks, meter error)	12.000	t
Same, share of feedwater	5.6604	%

Formula and method

$$S = S_1 - S_0 \ (+S_{max} \text{ after a roll-over}) \qquad W = W_1 - W_0 \ (+W_{max}) \qquad \bar{S} = \frac{S}{t_r} \qquad \bar{F} = \frac{F}{t_r} \qquad \frac{S}{F} \qquad d = \frac{W - S}{W}$$

Variables

S_0	steam totaliser, start	kg
S_1	steam totaliser, end	kg
W_0	feedwater totaliser, start	kg
W_1	feedwater totaliser, end	kg
$S_{max}\$, \$W_{max}$	totaliser roll-over values (0 = none)	kg
F	fuel burned	kg
t_r	running hours	s
S	steam generated	kg
W	feedwater supplied	kg
$\bar{S}$	average steam flow	kg/s
$\bar{F}$	average fuel flow	kg/s
S/F	steam per kg of fuel	kg/kg

$W - S$	feedwater not leaving as steam	kg
d	same, share of feedwater	–

Method and standards

Differences of totaliser readings over the shift or day; averages over the running hours.

Assumptions and limits

- Meters read at the same times; fuel burned from weighing or stock change.
- A totaliser that rolled over once during the period is handled when its roll-over value is entered.
- A warning appears when more than 10 % of the feedwater did not leave as steam.

References

- Totaliser differences and averages (definitions)

Report details

Report reference	FCC-8Y48-AKN6 (the same inputs always give the same reference)
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Calculator	Daily Boiler Log: Steam, Feedwater and Fuel
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Release checks	3 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/boilers-power-plant/plant-performance/daily-steam-and-fuel-report

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.