Boiler House Water Balance and Unaccounted Loss

Make-up water that should be needed from steam, condensate return and blowdown, and the unaccounted water loss compared with the metered make-up.

Method: Water mass balance of the boiler house

Input parameters

Unit system: SI

Parameter	Value	Unit
Make-up water metered in the period	95.000	t
Steam generated	200.00	t
Condensate returned	120.00	t
Blowdown, share of steam (not of feedwater)	5.0000	%

Calculated results

Parameter	Value	Unit
Unaccounted water loss	5.0000	t
Unaccounted loss, share of make-up	5.2632	%
Make-up that should be needed	90.000	t
Condensate return, share of steam	60.000	%

Formula and method

$$M_e = S - C + b\,S \qquad L = M - M_e \qquad l = \frac{L}{M} \qquad r = \frac{C}{S}$$

Variables

M	metered make-up water	kg
S	steam generated	kg
C	condensate returned	kg
b	blowdown, share of steam (not of feedwater)	–
L	unaccounted water loss	kg
l	loss, share of make-up	–
M_e	make-up that should be needed	kg
r	condensate return, share of steam	–

Method and standards

Mass balance of the steam–condensate–feedwater loop over a period.

Assumptions and limits

- Totals for the same period; no change in tank levels.
- Blowdown is a share of steam here; some sibling calculators use a share of feedwater (b_fw = b_s/(1 + b_s)).
- Every other use of water (deaerator vent, soot blowing, spray from outside the loop) shows up as unaccounted loss.

References

- Water mass balance of the boiler house

Report details

Report reference	FCC-N94E-1HP2 (the same inputs always give the same reference)
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Calculator	Boiler House Water Balance and Unaccounted Loss
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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/water-treatment/boiler-house-water-loss

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.