Collector loss report

C2 / Calculated output

24 kW

Total resistive loss at 200 A

Two feeders	**2 × 12.0 kW**
Equivalent	**24.0 kW**

Balance and reduction

Input: 200 A total RMS, balanced three-phase load.

Each identical branch carries 100 A RMS.

Parallel R = $(1/0.40 + 1/0.40)^{-1} = 0.20\ \Omega$.

Branch loss = $3 \times (100\ \text{A})^2 \times 0.40\ \Omega = 12$ kW.

Pair loss = 2×12 kW; equivalent = $3 \times 200^2 \times 0.20$.

Resistive example only; no shunts or reactances.

Voltage event and overlay

Prescribed balanced supply; phase A shown.

60 Hz sine, sampled at 4,800 samples/s.

RMS magnitude E = 0.70 pu from 50 to <100 ms;

otherwise E = 1.00 pu, including pre-event history.

$v(t) = \sqrt{2}\, E(t) \sin(2\pi \times 60t)$, with t in seconds.

Waveform RMS = $\sqrt{\text{mean}(v^2)}$ over the last 80 samples.

overlay.csv includes all three calculated series.

Companion illustrations

Revision: F2 alone increases to 0.60 Ω; total I fixed.

New R = 0.24 Ω; three-phase loss = 28.8 kW.

Separate DC test: isolated 120 mF, constant 300 kW.

$V^2 = 1500^2 - 2P\Delta t/C$, for $0 \le \Delta t \le 0.050$ s.

Separate reach check: Z = 36 V / 200 A at 0°.

Compare 0.18 Ω to 80% of the original 0.20 Ω.

No measured records, vendor runs, or validation claims.