Potroom Problem #4

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- Smelter increased amperage (+5 kA), <u>without any changes</u>, from 175 to 180 kA

- -15% reduction in workers

- Purchased "cheap" coke and alumina

<u>Calculation:</u>

Al Production (mt/yr) = 8.054 kgAl/kA x CE%/100 x kA x # cells x 365 days/yr x 1mt/1000 kg

Calculated Profit Margin

Amperage	mt/yr	mt/yr	mt/yr
180	250,000	- 5,500 (loss in CE%)	244,500
175			243,000
Difference			1,500
Sales Value per mt Al		$1700/mt Al	$2.55 million
Prod Costs per mt Al		$1550/mt Al	$2.33 million
Savings raw materials			$1.0 million
TOTAL GAIN			**$1.22 million**

Additional Potroom Costs

Carbon	Inc. 0.04 mt.mt	10,000 mt/yr	$600/mt C	$6.0 million
Energy	Inc. 0.5 kWh/kg	250,000 mt/yr	$0.023 /kWhr	$2.9 million
AlF3	Inc. 0.005 mt/mt	250,000 mt/yr	$2,000/mt AlF3	$2.5 million
Environmental	Emissions Fines	6 months	$25,000/month	$0.2 million
TOTAL ADDITIONAL COSTS				**$11.6 million**

Corrections to Operations

<u>Future 5 kA Increase:</u>

- Increase stub diameter & increase anode size => **constant anodic current density**

- Keep the **internal heat generation constant** or insulate less

- Only one change at a time!
  - Same raw materials
  - More manpower required

- Make economical study before any change.