Problem 8-11

Goal: Select most cost effective generator

Given:

Minimum Acceptable Return	12.0%	MARR
Design:	**Steam**	**Gas Turbine**
Fixed Capital Investment	$600,000	$400,000
Fuel Costs	$160,000	$230,000
Maintenance expenses	$12,000	$15,000
Insurance & Taxes	$18,000	$12,000
Depreciation recovery perio	20	10
Salvage Value	$0	$0

Approach: Incremental Investment paired comparison

calculate delta Investment

calculate straight line annual depreciation, (Investment - zero salvage)/life

calculate delta savings for each item, then sum to total savings, then delta ROI

compare to MARR, accept one and discard other

Alternate approach: Minimum Acceptable Return as an expense

add 12% of each investment ot costs and choose design with lowest cost

Calculations:

Design:	**Steam**	**Gas Turbine**	Compare Gas & Steam:	
Fixed Capital Investment	$600,000	$400,000	$200,000	additional investment
Fuel Costs	$160,000	$230,000	$70,000	savings from
Maintenance expenses	$12,000	$15,000	$3,000	additional investment
Insurance & Taxes	$18,000	$12,000	($6,000)	added cost
Depreciation charge	$30,000	$40,000	$10,000	reduced depreciation
Incremental Cost Savings with Steam			$77,000	annual Steam savings
Incremental Investment			$200,000	
Incremental ROI			**38.50%**	
			ACCEPT	

Answer **Recommend** **Steam Boiler**

Alt. Calculations:

Design:	**1**	**2**
Fixed Capital Investment	$600,000	$400,000
Sum of Operating Costs	$220,000	$297,000
MARR expense	$72,000	$48,000
Venture Cost =	**$292,000**	$345,000
Accept Minimum Annual Venture Cost:	$292,000	= MIN(E50:F50)
	lowest	**highest**

Answer **Recommend** **Steam Boiler**

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