Case study on target costing

Roberta Ward, the manager of the engine division at Giant Motors, ordered a review of engine division's operations. A study group prepared a report that suggested engine divisions cost were about 25% higher than the costs of organizations producing comparable engines. Ward immediately instructed her senior managers to implement a process of target costing. Ward's objective was to better any market price offered by any competitor.

There were 4 important engine requirements: power, fuel consumption, weight, and noise level. Costs increased with designs that increased engine power and quietness, and in general, costs decreased as fuel consumption and weight increased. In addition, there were complex interactions between the four engine characteristics. Ward and her staff decided that the division would reduce product line complexity and therefore costs by offering three new engines that were adaptations of existing engines, each having a unique mix of power, fuel consumption, weight, and quietness features. Following table provides details for each of the three engines.

	Engine 1	Engine 2	Engine 3
Projected lifetime value	$8,50,000	$2,200,000	$1,500,000
Target avg. selling price	$ 7500	$ 4500	$ 6000
Target avg. margin	$ 1100	$ 800	$ 1000
Target cost	$ 6400	$ 3700	$ 5000
Raw materials cost	$ 2500	$ 1800	$ 2300
Purchased components	$2200	$1400	$1200
Indirect costs	$ 3317	$ 1649	$ 2699
Projected costs	$ 8017	$ 4849	$ 6199

An analysis provided the indirect cost detail reported in the following tables:

Unit-Related Indirect Costs:

		Driver Units			
Cost Item	**Driver**	**Driver cost($)**	**Engine 1**	**Engine 2**	**Engine 3**
Assembly	**Assembly hours**	35	7	3	5
Quality assurance	**Inspections hours**	42	2	1	2
Rework	**Labor hours**	35	3	1	3
Material handling	**Helper hours**	28	5	2	4

Batch-Related Indirect Costs:

			Driver Units		
Cost Item	**Driver**	**Direct Cost ($)**	**Engine 1**	**Engine 2**	**Engine 3**
Moving	**Number of moves**	50	7	5	4
Setup	**Setup hours**	250	8	4	7

Product Related Indirect Costs:

Compiled by: Chhaya Sehgal

	Engine 1		Engine 2		Engine 3	
Cost Item	Total Cost($)	Cost/unit($)	Total Cost($)	Cost/unit($)	Total Cost($)	Cost/unit($)
Engineering	80 million	94	45 million	20	55 million	37
Supervisory	8 million	9	8 million	4	8 million	5

Facility-Sustaining Indirect Costs:

			Driver Units		
Cost Item	Driver	Direct Cost ($)	Engine 1	Engine 2	Engine 3
General Administrative	Labor hours	18	17	7	14
General Overhead	Material costs	-0.02	2500	1800	2300

Options Available to change Design/Production Process:

Value Engineering:

Engine design can put together a team and can undertake a value engineering exercise. The team purchases engines from competitors and dismantles the engines to develop alternative engine design ideas. In addition the team works with design engineers to identify new designs that will accomplish the same functions with a lower cost to eliminate unneeded functions. The value engineering activity results in the changes shown in the following table.

Changed Item	Engine 1	Engine 2	Engine 3
RM Costs	$2,400	$1,600	$2,200
Purchased Components costs	$2,100	$1,300	$1,000
Assembly hours	6	2	4
Rework hours	2	No change	2

Functional Analysis:

Then design team evaluates power, fuel consumption, weight, quietness levels for each of the three engines. The team interviews customers to identify situations in which a change in any of these elements, up or down, will increase (decrease) in the costs less (or more) than the corresponding increase (decrease) in the price that the customer is willing to pay suppose that this process results in the following changes in each of these functions for the three engines.

Based on the function changes, the prices of engine 1, 2 and 3 become $7200, $4800 and $6300, respectively; the raw materials costs become $2200, $1700 and $2400; the assembly hours become 4, 3 and 5; the materials hours become 5, 3, and 4: and the engineering costs become $70,000,000, $50,000,000 and $62,000,000.

Re-engineering:

The design team proceeded to the process design which involved considering changes to the current process the Engine division was using to make motors. This process was the basis for the cost

projections for the new motors. The design team focused specifically on the production process and on identifying new ways to design the sequencing and assembly of engines. In conjunction with suppliers, the team developed a JIT manufacturing process and reorganized the production lines from a batch oriented system that involved moving assembly components in different parts of the plant to a continuous flow system that used manufacturing cells. These changes were directed particularly at eliminating non-value added activities in the assembly process but also considered efficiencies in value-added activities. This process design resulted in the following activity changes. For engines 1, 2 and 3 respectively:

1. Assembly hours became 3, 2 and 4.
2. Inspection hours became 1,1 and 2
3. Rework hours became 1,1 and 1
4. Materials handling hours became 3,2 and 2
5. The number of moves became 4,2 and 2
6. Setup hours became 4,2 and 5
7. Engineering costs which included the cost of process redesign, became $115000000, $80000000, and $95000000

You are required to work out a target cost which will ensure a positive projected profit for each engine after considering the options available to change the design and/ the production process.