

## *Case 29*

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# *New Fangled Manufacturing*

*by*

*Lee McFarland and Daniel Franchi*

*California Polytechnic State University – San Luis Obispo*

You are the engineering representative on a team for a new product introduction. The proposed manufacturing process uses a semi-automated machine along with people.

Components for each unit of the product cost \$8. The semi-automated machine costs \$1,500,000, and it has a 7-year MACRS recovery period. The salvage value is \$0 for this specially designed machine. This machine can manufacture 175 finished parts per hour.

**Table 29-1      Production Volume (1000's)**

Year	1	2	3	4	5	6	7	8	9
Volume	195	275	385	550	625	695	630	550	295

The normal manufacturing operation runs 8 hours per shift per day. Initial production would begin with one shift, 5 days a week. The machine placed in the facility must support this plan. Each working year has 50 weeks (250 regular working days) to allow for vacations. The total labor cost is \$50 for each regular time hour that the machine operates and \$65 for overtime (these costs include benefits).

Assume that employees can be shifted between production of this new product and other products already in manufacturing. This assumption means that this product is charged with only those hours used and not with one or two full 8-hour shifts.

The production operation can operate a maximum of 8 extra hours/week, if needed to meet the demand without adding an extra shift. This may be a 6<sup>th</sup> day or some hours added at the end of the regular shift. Many employees like to earn “some” overtime. Thus, the overtime option is more desirable than adding a second shift if overtime can meet the demand.

Other required information:

Corporate MARR	12% (after tax)
Cost of borrowing	9%
Effective tax rate	35%
Maintenance cost	12% of raw material cost
Overhead cost	2% of raw material cost
(utilities, supervision, marketing, etc.)	

The decision of whether to release the new product into production requires answers to the following questions:

- What average selling price of the finished product would be required to yield a 20% after-tax rate of return?
- Is the NPV more sensitive to changes in raw material cost or changes in selling price?
- Is the IRR more sensitive to changes in raw material cost or changes in selling price?
- Do variations in the machine’s cost have a significant impact on the IRR or NPV?