

## **FINANCE 325: CAPITAL BUDGETING CASE**

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Sawyer M. Teague, president of Amtek Ironworks, is faced with a classic problem in capital budgeting: whether or not to buy a new machine to replace existing equipment. Amtek Ironworks makes iron castings for manufacturing use. The Spartan Machine Molder would replace several older stamping machines and would improve quality and increase capacity for expansion. Teague, at the request of the board of directors, is to conduct a careful analysis of the replacement proposal and recommend an investment decision to the board.

Sand molds used to make iron castings are currently created in a semi-automated process. This process is highly labor-intensive and requires continued investment in a highly-skilled labor force. The Spartan Machine Molder would replace six of these semi-automated machines that, together, had originally cost \$831,614 four years ago. All machines at Amtek are depreciated using a 10-year accelerated depreciation schedule (see table at end of case). Teague believes that these six machines would eventually need to be replaced in 6 years and would have no salvage value at that time. Teague also knows that he can sell these machines today for \$260,000.

The existing six machines require 12 workers per shift<sup>1</sup> currently earning \$14.66 per hour per worker. In addition, these machines require a total of 3 maintenance workers at \$15.70 per hour per worker as well as annual maintenance costs of \$8,000. During the past year, these machines consumed \$24,600 in electrical power.

The purchase price of the Spartan Machine Molder is \$1,700,000. The cost for modifying the existing plant for the new machine is \$310,000. Allowing for all installation and testing costs, the final total cost to Amtek would be \$2.02 million, all of which would be capitalized and depreciated to zero over ten years using the accelerated depreciation schedule. However, due to the high anticipated usage of this machine, Teague believes that the new machine would need to be replaced in 8 years and would have no salvage value at that time.

The new machine would require only one worker per shift, earning \$22.72 per hour, and they would use contract maintenance for \$119,000 per year. The new machine would use \$53,700 in electrical power during its first year, but would save the company at least \$10,400 annually through efficiency gains in other areas of the plant.

With the current six machines, space requirements for raw materials and inventory for each machine occupy 30% of the total plant floor space. With the new machine, half of this space would be freed up for other purposes (although presently there is no need for new space.)

Given the firm's collective bargaining agreement with the plant's labor union, Teague was unsure if he would be able to lay off the operators of the existing equipment. Thus, the extent of labor savings would depend on negotiations with the labor union. Also, the Spartan Machine Molder would result in higher quality products than currently being produced. Given the current

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<sup>1</sup> Amtek operated two 8-hour shifts per day. Given holidays and weekends, Amtek operated a total of 210 days per year.

competitive environment, this outcome was important but unquantifiable. Also, the Spartan Machine Molder had a 30% higher maximum capacity than the six existing machines, but those machines were currently running at 90% capacity and Teague was unsure about when additional capacity would be needed (especially given the current economic situation).

Teague believes that general inflation will be 4% per year, but that wage costs will only increase by 3% per year for the foreseeable future. The corporate tax rate is 35%, and Amtek expects sizeable taxable income in all upcoming years. For capital expenditures such as this one, Amtek employs a cost of capital of 10%.

Any costs associated with purchasing and installing the equipment would be incurred immediately, while operating costs would be recognized starting next year.

Your group has been hired by Mr. Teague to analyze the issues facing Amtek’s purchase decision. Your group should address the following tasks and questions in the form of a two-page memo to Mr. Teague. You should attach spreadsheets to support your analysis. You may have as many pages of supporting material as you like, but the two-page memo should be self-contained and completely answer the questions. **The case is due in class on Thursday, November 18<sup>th</sup>.**

1. Should Amtek purchase the new Spartan Machine Molder? Justify your recommendation with valuations.

Note: In this part of your analysis, you may assume that the semi-automated equipment could be operated for two more years beyond the end of its depreciable life thanks to ordinary maintenance. Thus, the lives of both the semi-automated and Spartan Machine Molder alternatives will be eight years.

2. Are there issues left unresolved in the analysis thus far? What additional considerations should be made and what kind of information would you like to have?
3. Now assume that the semi-automated equipment will be inoperable after its depreciable life (ie: the extra two years of ordinary maintenance from above will not keep them working). Assume that the semi-automated machines were purchased 4 years ago (they have a total productive life of 10 years). How does this affect your analysis? What investment decision should Amtek make in this case?
4. What are the different risks involved in purchasing the Spartan Machine Molder vs. staying with the semi-automated machines?

**10-year Accelerated Depreciation Schedule**

Year:	0	1	2	3	4	5	6	7	8	9	10
% depreciated	10.0	18.0	14.4	11.52	9.22	7.37	6.55	6.55	6.55	6.55	3.29