Case Study

Mexicana Wire Works

Ron Garcia felt good about his first week as a management trainee at Mexicana Wire Winding, Inc. He had not yet developed any technical knowledge about the manufacturing process, but he had toured the entire facility, located in the suburbs of Mexico City, and had met many people in various areas of the operation.

Mexicana, a subsidiary of Westover Wire Works, a Texas firm, is a medium-sized producer of wire windings used in making electrical transformers. Carlos Alverez, the production control manager, described the windings to Garcia as being of standardized design. Garcia’s tour of the plant, laid out by process type (see Figure 7.20), followed the manufacturing sequence for the windings: drawing, extrusion, winding, inspection, and packaging. After inspection, good product is packaged and sent to finished product storage; defective product is stored separately until it can be reworked.

On March 8, Vivian Espania, Mexicana’s general manager, stopped by Garcia’s office and asked him to attend a staff meeting at 1:00 P.M.

“Let’s get started with the business at hand,” Vivian said, opening the meeting. “You all have met Ron Garcia, our new management trainee. Ron studied operations management in his MBA program in southern California, so I think he is competent to help us with a problem we have been discussing for a long time without resolution. I’m sure that each of you on my staff will give Ron your full cooperation.”

Vivian turned to José Arroyo, production control manager. “José, why don’t you describe the problem we are facing?”

“Well,” José said, “business is very good right now. We are booking more orders than we can fill. We will have some new equipment on line within the next several months, which will take care of our capacity problems, but that won’t help us in April. I have located some retired employees who used to work in the drawing department, and I am planning to bring them in as temporary employees in April to increase capacity there. Because we are planning to refinance some of our long-term debt, Vivian wants our profits to look as good as possible in April. I’m having a hard time figuring out which orders to run and which to back order so that I can make the bottom line look as good as possible. Can you help me with this?”

Garcia was surprised and apprehensive to receive such an important, high-profile assignment so early in his career. Recovering quickly, he said, “Give me your data and let me work with it for a day or two.”

**April Orders**

Product W0075C 1,400 units

Product W0033C 250 units

Product W0005X 1,510 units

Product W0007X 1,116 units

***Note:*** *Vivian Espania has given her word to a key customer that we will manufacture 600 units of product W007X and 150 units of product W0075C for him during April.*

**Figure 7.20**

Mexicana Wire Winding, Inc.

|  |  |  |  |
| --- | --- | --- | --- |
| Office | Wire Drawing |  | Finished Product Storage |
|  | | Rework Department |
| Receiving and Raw Material Storage | Packaging |
| Winding | Rejected Product Storage |
| Extrusion |
| Inspection | |

**Standard Cost**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Product** | **Material** | **Labor** | **Overhead** | **Selling Price** |
| W0075C | $33.00 | $9.90 | $23.10 | $100.00 |
| W0033C | 25.00 | 7.50 | 17.50 | 80.00 |
| W0005X | 35.00 | 10.50 | 24.50 | 130.00 |
| W0007X | 75.00 | 11.25 | 63.75 | 175.00 |

**Selected Operating Data**

Average output per month = 2,400 units

Average machine utilization = 63%

Average percentage of production set to rework department = 5% (mostly from Winding Department)

Average no. of rejected units awaiting rework = 850 (mostly from Winding Department)

**Plant Capacity (Hours)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Drawing** | **Extrusion** | **Winding** | **Packaging** |
| 4,000 | 4,200 | 2,000 | 2,300 |

***Note:*** *Inspection capacity is not a problem; we can work overtime, as necessary, to accommodate any schedule.*

**Bill of Labor (Hours/Unit)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Product** | **Drawing** | **Extrusion** | **Winding** | **Packaging** |
| W0075C | 1.0 | 1.0 | 1.0 | 1.0 |
| W0033C | 2.0 | 1.0 | 3.0 | 0.0 |
| W0005X | 0.0 | 4.0 | 0.0 | 3.0 |
| W0007X | 1.0 | 1.0 | 0.0 | 2.0 |

**Discussion Questions**

1. What recommendations should Ron Garcia make, with what justification?
2. What is the Maximum profit?

Hints:

Objective function: Max profit=34 w75c + 30 W33C + . . . . .

Subject to: 1 W75C<=1,400

. . . .

1 w75C + 2 W33C + 0 W5X + 1 W7X <=4,000

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There are 10 Constraints.