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9B21B003

PROJECT SPARROW: APPLYING COSTING METHODS

Kaitlyn Oh wrote this case under the supervision of Ian Dunn solely to provide material for class discussion. The authors do not intend to illustrate either effective or ineffective handling of a managerial situation. The authors may have disguised certain names and other identifying information to protect confidentiality.

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It was August 20, 2019, and Emily Baumberg, a newly promoted project manager at Roland Berger, had just settled into her seat in the conference room. Baumberg was reflecting on her four-year career at the global management consulting firm when she heard a knock on the door. She was currently staffed in Houston, Texas, on a three-month project with Sparrow GmbH[[1]](#footnote-1) (Sparrow), a small-scale chemical manufacturer. The door creaked open, and Sparrow’s pricing manager entered with a warm cup of coffee for Baumberg. The pricing manager also requested a small favour. Although Baumberg and her team were focused on optimizing costs at Sparrow’s production facilities, the pricing manager had heard that the team was thinking about Sparrow’s cost structure in a new way. He thought this knowledge could help him to determine a more competitive bid price for Sparrow’s chemicals contract with Impendium Chemicals (Impendium), one of Sparrow’s top customers. Baumberg chatted with the pricing manager as they sipped their coffee, and she agreed to provide him with a winning pricing strategy by the end of the week.

Sparrow GMBH

Sparrow was a chemical manufacturer based in Germany. The company had two main product categories: basic chemicals and specialty chemicals. Basic chemicals were commodity chemicals derived from oil and petroleum by-products. These products were manufactured in large volumes, with minimal product differentiation from producer to producer. Specialty chemicals were hardened or cured polymers, similar to plastic. The specialty chemical division manufactured unique products based on Sparrow’s patented manufacturing processes and formulations. Sparrow’s basic and specialty chemical divisions were not related to each other.

Sparrow currently had two manufacturing facilities: one located in the United States and one located in Germany. The German facility manufactured both basic and specialty chemicals, while the US plant manufactured only basic chemicals.

Sparrow’s pricing strategy for the Impendium Bid

Sparrow underwent a bidding process for all of its chemical contracts. Each customer would re-evaluate its chemical pricing at least once per year and would typically choose the most price-competitive offer. Customers were generally price-conscious and switched suppliers quickly if a different supplier offered significantly lower prices while maintaining customer service and reliability. Impendium was one of Sparrow’s largest basic chemicals customers and had purchased chemicals exclusively from Sparrow for the past two years. However, in an effort to cut costs, Impendium’s board of directors was pressuring the company to consider multiple suppliers. The pricing manager had previously priced the contract based on the salesperson’s recommendations and his own costing estimates. However, with the additional pressure to lower prices, the pricing manager wanted to ensure that Sparrow’s pricing strategy would win the bid. To help Roland Berger develop a pricing strategy, the pricing manager had provided the monthly job cost sheet for Impendium’s order (see Exhibit 1).

market Dynamics

Sparrow was one of the smallest basic chemical producers in an industry where the four largest players controlled 80 per cent of the global production capacity. Unlike Sparrow, these large players converted basic chemicals into more complex products and, as a result, were often able to generate much higher profit margins.

Customers had access to the global average price of basic chemicals, which they often used as a benchmark when selecting suppliers. The main determinant of the global average price in the basic chemicals industry was the global capacity utilization rate. In the past decade, a few companies in Asia had expanded their capacity by adding new facilities, resulting in a decline in the capacity utilization rate and all-time low basic chemical prices.[[2]](#footnote-2) Global basic chemical prices had since stabilized at US$3,450[[3]](#footnote-3) per kiloton at an industry capacity utilization rate of 70 per cent.[[4]](#footnote-4) For the price to increase, experts estimated that the industry would need to improve the capacity utilization rate to 80 per cent to reach basic chemical prices of $4,350 per kiloton.[[5]](#footnote-5)

sparrow’s basic chemical costs

Baumberg and her team needed to decide how to estimate Sparrow’s cost structure. Baumberg had been given access to Sparrow’s projected costs for fiscal year 2020, but the projections included both specialty chemicals and basic chemicals (see Exhibit 2). Baumberg and her team would need to determine the best way to allocate the costs to determine the allocation rates for the job cost sheet.

The US basic chemicals facility was much newer than the German facility, although it had a much lower capacity. The US facility was built eight years ago, while the German facility was built 18 years ago. The US basic chemicals facility had one reactor with a capacity of 150 kilotons, while the German basic chemicals facility had a cumulative capacity of 250 kilotons. Both basic chemical plants were expected to continue operating at 60 per cent utilization rate. The German specialty chemicals facility had a much larger capacity of 600 kilotons and was expected to operate at a 75 per cent utilization rate.

Regardless of their utilization rate, the reactors would require a proportionate amount of power and supplies based on their capacity to operate. The best estimate for repairs expenses was the proportionate age of the machinery.

Sparrow owned all of its production facilities and associated assets. The US basic chemicals plant, including the reactors, originally cost $60 million, whereas the German basic chemicals plant cost $70 million, and the German specialty chemicals facility cost $160 million. All buildings and machinery were depreciated using the units of output method based on the expected production. In contrast, Sparrow’s insurance policy on the manufacturing assets was based on the historic cost of the assets.

The budgeted direct labour cost of $279,450 comprised $9,450 for the US basic chemicals plant, $22,500 for the German basic chemicals facility, and $247,500 for the German specialty chemicals department. In addition, each factory had a factory supervisor. In the United States, the supervisor was paid $50,000. In Germany, one supervisor for each business division was paid $75,000 (see Exhibit 3).

The costs shown for shipping and receiving were to be spread evenly across each division. Although Sparrow owned its production facilities, it did rent raw material warehousing space. In the United States, Sparrow rented 15,000 square metres of warehouse space. In Germany, Sparrow rented 35,000 square metres for basic chemicals and 90,000 square metres for specialty chemicals.

In addition, Sparrow rented an office space in the United States for $30,000 per year. Sparrow employed two salespeople. One salesperson focused on the basic chemicals sales, while the second salesperson focused on selling specialty chemicals. Sparrow also employed one general manager who oversaw both basic and specialty chemicals.

In her research, Baumberg noticed that many industry experts were forecasting higher capacity utilization rates in the basic chemicals industry due to expected plant closures. Most experts agreed that basic chemical utilization rates would increase to 80 per cent in the next year. Baumberg had reason to believe that many of the displaced customers from the plant closures would purchase their basic chemicals from Sparrow. As a result, Sparrow’s basic chemicals capacity utilization rate would increase to 90 per cent. Baumberg wanted to understand the implications on the Impendium bid if utilization rates increased. In this scenario, Baumberg estimated that Sparrow’s basic chemicals direct labour costs would increase to $14,175 in the United States and $33,750 in Germany, and the direct material costs would increase to $78,975 in the United States and $253,125 in Germany. The specialty chemicals division would remain unchanged.

Baumberg sat down to complete the analysis for Sparrow’s pricing manager. To begin, she wondered what Sparrow’s costs were for each of its divisions. She was concerned about which factors should be taken into account in addition to the costs and how to advise the pricing manager. Baumberg had only a few days to put together her analysis before her flight back home to Boston on Thursday evening, and she was eager to give the pricing manager an answer.

Exhibit 1: Impendium Chemicals job cost Sheet

|  |  |
| --- | --- |
| Company Name | Job Cost Sheet Invoice #100Date: September 1, 2019 |
| To: Impendium Chemicals  1225 Industrial Parkway  Houston, TX  77029 |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Department | Volume (kt) | Material Cost (per kt) | Labour Rate (per kt) | Depreciation Cost (per kt) | Cost | Overhead Applied | Total |
| US Basics | 10.0 | $ 585.00 | $ 105.00 | $ 415.00 | $ 11,050.00 |  |  |
| Germany Basics | 15.0 | $1,125.00 | $ 150.00 | $ 275.00 | $ 23,250.00 |  |  |
| Germany Specialties | 1.0 | $1,698.00 | $ 550.00 | $ 325.00 | $ 2,573.00 |  |  |
| Total | 26.0 | –– | –– | –– | $ 36,873.00 |  |  |

Note: All dollar amounts are in US dollars; kt = kiloton.

Source: Created by the case writers.

exhibit 2: sparrow Gmbh’s budgeted costs for 2020 (US$)

|  |  |
| --- | --- |
| Direct labour | $ 279,450 |
| Direct material | 985,500 |
| Supervision | 200,000 |
| General manager’s salary | 140,000 |
| Supplies | 21,000 |
| Shipping and receiving | 34,500 |
| Power | 140,000 |
| Warehousing rent | 120,000 |
| Office rent | 30,000 |
| Depreciation on machinery | 225,000 |
| Insurance on machinery | 24,000 |
| Repairs | 63,000 |
| Selling expenses | 70,000 |
| Administrative expenses | 33,500 |

Note: To calculate depreciation on machinery, Sparrow used the units of output method based on kilotons of chemicals produced. The US reactors were depreciated at a rate of $415 per kiloton. The Germany basic chemical reactors were depreciated at a rate of $275 per kiloton, and the Germany specialty chemical reactors were depreciated at a rate of $325 per kiloton.

Source: Created by the case writers.

Exhibit 3: sparrow Gmbh’s Annual Cost Assignment and Allocation Worksheet (US$)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Total** | **US Basics** | **Germany Basics** | **Germany Specialties** |
| **Direct Costs:** | | | | |
| Direct labour | $279,450 | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ |
| Direct material | 985,500 | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ |
| Depreciation on machinery | 224,850 | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ |
| Total direct costs | $ 1,489,800 | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ |
| **Factory Overhead Costs** | | | | |
| Supervision | $ 200,000 | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ |
| Supplies | 21,000 | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ |
| Power | 140,000 | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ |
| Warehouse rent | 120,000 | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ |
| Insurance on machinery | 24,000 | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ |
| Repairs | 63,000 | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ |
| Total factory overhead costs | $ 568,000 | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ |
| **Administrative Costs** | | | | |
| General manager | $ 140,000 | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ |
| Shipping and receiving | 34,500 | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ |
| Office rent | 30,000 | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ |
| Selling expenses | 90,000 | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ |
| Administrative expenses | 30,000 | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ |
| Total administrative expenses | $ 324,500 | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ |
| **Overhead Application Rates** | | | | |
| Factory overhead application rate |  | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ |
| (FOH expenses ÷ Production volume) |  |  |  |  |
| Total overhead application rate |  | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_ |
| (Total expenses ÷ Production volume) |  |  |  |  |

Note: FOH = factory overhead.

Source: Created by the case writers.

1. A Gesellschaft mit beschränkter Haftung (abbreviated GmbH) was a private company with limited liability, usually found in Germany, Austria, Switzerland, and Liechtenstein. [↑](#footnote-ref-1)
2. Company files. [↑](#footnote-ref-2)
3. All dollar amounts are in US dollars. [↑](#footnote-ref-3)
4. Company files. [↑](#footnote-ref-4)
5. Ibid. [↑](#footnote-ref-5)