

Case Study Name: Value-Based Supplier Selection in Capital-Intensive Manufacturing

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***The case problem that I analyzed and addressed in this study is in page number 7.*

1. Major Facts:

- Oceanics is doing an evaluation of two finalists, Atomic Products Company (APC) and Nuclear Vessels, Inc. (NVI) from the total of 18 proposals for a specialized nuclear pressure vessel.
- APC has higher shop rates, low relevant experience, and unionized labor but the bid is significantly lower at \$1,232,000 than competition.
- NVI has higher bid of \$1,560,001 but it features lower cost rates, great proven experience, they are very enthusiastic about the project, the quality systems is mature and the management is very proactive.
- The key difference in the two companies that are being evaluated is that they vary a lot in their willingness and ability to guarantee materials and workmanship where one is good and other is not that promising but both companies have claimed on-time delivery and minimal subcontracting.
- The most difference between the vendors are seen in the technical and organizational fit such as risk in labor, project's traceability, and engagement.

2. Major Problems:

- The decision must balance both the short-term cost savings against long term value risk and then the potential for organizational profits in partner reliability relationship.
- Focusing on the price rather than the value derived is the main risk for Oceanics which creates vulnerability to cost overruns and delays as well as specifications that are not what was asked for in a mission critical project.

3. Possible Solutions:

A. Select Atomic Products Company:

APC offers a "cost-plus" contract at the lowest price, with good equipment and a complete guarantee of workmanship and materials. Weaknesses include limited experience with large vessels, undefined control over materials and possible labor strikes. The Strategic Pricing Pyramid approach is to analyze the low price as well as the value created (technical fit, risk, quality assurance, etc.) and to negotiate a price that reflects the total economic impact of the offer, rather than just the sticker price.

B. Select Nuclear Vessels, Inc:

The more expensive alternative has the benefits of significant experience, clear process control assurance, and a history of successful collaboration with Oceanics. The shortcomings are the workmanship guarantee, higher price tag and older equipment. The strategy is to use the Strategic Pricing Pyramid to effectively balance the pricing architecture, supplier engagement, and risk sharing with value creation through a focus on reliability and project control, which can reduce the total cost of ownership even with a higher initial cost.

4. Possible Solutions:

Advantage A:

- Appears to be a cheaper option at the surface level and provides a guarantee on broad materials and workmanship.
- The facilities look modern and are very neat and tidy, also the location of it makes it a potential for future customer relationship.

Disadvantage A:

- Building at this scale lacks proven value as strategic pricing stresses that the supplier experience and reliability are very important as they are important parts for value.
- Once the hidden costs from project overruns are accounted, the lower price set by APC in value-based terms could be termed as false economy.
- They are unable to address important questions related to material control which is a very important factor for nuclear applications.

Advantage B:

- Universal NVI has proven ability to deliver the required value and are very reliable as well. Their prior experiences reduce a major risk of costly surprises later.
- They have brilliant project management, engagement and also are very committed which makes this vendor relationship more like a partnership.
- The price premium is very justifiable due to factors like low risk and higher delivered value.

Disadvantage B:

- The sticker price is on the higher end and there is risk of material flaws.
- Even though they are very experienced and sought after, their equipment are older which might cause some minor inefficiencies.

5. Choice and Rationale:

In my view solution B, Nuclear Vessels, Inc. should be selected even though the initial cost is on the higher side due to their experience of building big, complicated vessels which the Oceanics need. They have also shown that they can do their job well in this field which reduces the risk of making mistakes from them which in turn reduces time for fixing mistakes and reduces future costs for any mistakes or problems. Their system also seems to be very good in tracking everything, which makes them very trustworthy to deliver what they have promised. By not just looking at the spending upfront but at the overall value, safety, system, and proper communication that Oceanics can get from NVI, it looks like a safer option for Oceanics.

6. Recommendations / Implementation:

- Achieve ongoing value alignment and transparent price communication throughout contract lifecycle with the help of periodic value reviews and stage gates.
- Drive joint accountability and partnership for cross functional task force between the supplier and customer.
- Leverage pricing policies to push for inclusion of risk sharing clause and negotiate cost caps for any material nonconformity.
- Ask NVI to report on each dimension of value they deliver which insures proof of value

- Process control monitoring and early audits as value insurance which would act as a small cost compared to total potential for project failure or latent costs.
- Capture data from project outcomes and lessons learned for future price or supplier selection.

References

Nagle, T. T., & Hogan, J. The Strategy and Tactics of Pricing: A Guide to Growing More Profitably (7th Edition).

SELECTION OF A PRESSURE VESSEL MANUFACTURER

On August 1, the engineering department hand-carried a purchase requisition to Jack Toole, supply manager, Oceanics, Inc. The requisition covered the purchase of one pressure vessel to Oceanics' specifications as outlined in the requisition. Immediately, Jack went to work. He prepared a request for quotations asking twenty major pressure vessel manufacturers to have their proposals in his hands no later than Wednesday, August 31. The response to Jack's request for quotations was amazing.

During the month of August, eighteen of the twenty companies hurriedly prepared their proposals and submitted them to Jack within the allotted bidding time. As each proposal was received on Jack's desk, copies were forwarded to the engineer and manufacturing engineer for preliminary evaluation. By September 5, Jack called a meeting in his office with the engineer, Mr. Holpine, and the manufacturing engineer, Mr. Grinn.

During the course of the meeting, proposals were carefully screened and bidders were eliminated one by one until two companies remained. It was a difficult decision for the group to decide which of the two companies submitted the better proposal. The advantages and disadvantages of each supplier appeared to be about equal. Jack pointed out that Atomic Products Company submitted a lower estimated price, guaranteed the equipment, was more suitably located, and would meet the required delivery date. Jack also pointed out to Grinn and Holpine that Nuclear Vessels, Inc., offered Oceanics lower hourly and overhead rates, a minimum amount of subcontracting, and excellent past experience in making similar vessels. Jack stated that a field trip would be necessary to talk with both suppliers to determine which one was best qualified. At this point the meeting was adjourned and plans were made to visit both companies the following week. (See Exhibits 1 and 2.)

In following through with supply management policy, Jack called the vice president of Oceanics' New York sales office and advised him of the potential trip. Jack learned that Atomic Products was a potential customer for Oceanics' products, but Oceanics' sales representatives were unable to get into the plant to meet key people responsible for procurement of major equipment. The vice president of sales stated that a sales rep would be at the airport to meet Oceanics' representatives and take them to the Atomic Products Company first thing Monday morning. Jack phoned the president, Mr. Wilcox, and advised him that representatives from Oceanics would like to be at his plant Monday morning to review his plant facilities and meet the responsible people. The president did not appear to be enthusiastic, but said that he would be pleased to see them when they arrived.

EXHIBIT 1

Atomic Products Company, New York, N.Y.

We are pleased to submit a proposal in accordance with your request for the manufacture of one pressure vessel in accordance with your sketch #835 and all referenced specifications pointed out in your letter of August 2.

Price. Because of the potential changes pointed out in your invitation to bid, and in line with your request, the work will be performed on a cost-plus-a-fixed-fee contract detailed as follows:

| | | |
|------------------|---------------------|----------------------------|
| a. Total price: | Estimated cost | \$1,120,000 |
| | Fixed fee | <u>112,000</u> |
| | Total | \$1,232,000 |
| b. Costing rate: | Estimated shop rate | \$24/hour |
| | Shop overhead | 180% |
| | Material | Cost + 10% handling charge |

Shop facilities. There are adequate facilities at our New York Plant to manufacture the vessel and meet the specification to the fullest extent possible. We invite you and your associates to visit our facilities.

Past experience. Our company has not made vessels of this size but does have the equipment and know-how necessary to perform the work. Our experience has been in working with vessels up to 60" in length, I.D. 30" and 3" wall.

Subcontracting. We will be able to fabricate the entire vessel without exception in our shop.

Organization. A total of 2,000 employees is directly associated with our division.

Delivery. The pressure vessel will be shipped f.o.b. shipping point via rail in 6 months providing there are no engineering changes.

Guarantee. We guarantee workmanship and materials to be in accordance with the specifications which were supplied to us at the time of this proposal.

EXHIBIT 2

Nuclear Vessels, Inc., Houston, Texas

Reference is made to your invitation to bid dated August 2 to manufacture the pressure vessel in accordance with your negative #835, and referenced specifications and any future changes necessary.

Price. The work will be performed on a cost-plus-a-fixed-fee basis, broken down as follows:

| | | |
|-------------------|---------------------|-------------|
| a. Total price: | Estimated cost | \$1,560,000 |
| | Fixed fee | <u>1</u> |
| | Total | \$1,560,001 |
| b. Costing rates: | Estimated shop rate | \$16/hour |
| | Shop overhead | 160% |
| | Material | At cost |

Shop facilities. We have adequate shop facilities to manufacture and deliver the vessel and would be pleased to have representatives from your company visit our facilities at any time.

Past experience. The company has had extensive experience in manufacturing pressure vessels of heavy plate. Vessels 80" I.D., 40' long, 5" thick and many others have been handled by this company.

Subcontracting. It will not be necessary for the company to subcontract any of the forming, welding, machining, or testing for this work. However, forgings will be purchased from a competent supplier after he has satisfied the company's metallurgist that his forgings will meet the specifications.

Organization. The Supply, Expediting, Quality Control, Production and other departments will each have one man assigned to follow this project from start to finish. Forms and records are available for your review. Our organization is familiar with Oceanics' requirements from knowledge gained as a result of previous work accomplished for your division.

Delivery. The pressure vessel will be shipped f.o.b. shipping point, Houston, Texas, to your Pittsburgh location within your required delivery time of six months or shortly thereafter.

Guarantee. This company will guarantee only workmanship. The rigid material specifications make it difficult for our supplier to furnish plate without any inclusion of slag deposits. Oceanics will have to stand the costs of any plate rejected or repaired after being tested by ultrasonic methods. Such costs can be negotiated after such defects are found.

Another call was also made to Nuclear Vessels' president, Mr. Winninghoff, who was quite enthusiastic about the potential visit and asked if he could meet the group at the airport, make hotel reservations, or perform other courtesies. Jack advised Mr. Winninghoff that these matters were taken care of and that an Oceanics sales representative for the Houston, Texas, area would accompany the group during the visit.

Monday morning, Messrs. Toole, Grinn, and Holpine took off from Pittsburgh and arrived at Kennedy Airport in New York. Mr. Morgan, the sales manager of Oceanics' New York office, met the group and drove them to the main office of the Atomic Products Company. The group registered, obtained passes, and went to the conference room. Shortly thereafter, the manager of production, Mr. Strickland, entered, introduced himself, and stated that the president was tied up but would see them later in the day. Jack Toole opened the meeting by stating that Atomic Products' proposal was among the top contenders for supplying the pressure vessel and it was Oceanics' desire to look over Atomic Products' facilities and meet the people responsible for the job. Jack Toole asked Holpine to explain in greater detail the use of the vessel in the reactor system and to give Mr. Strickland some background on the engineering work relating to the vessel. Mr. Grinn reviewed the manufacturing aspects of the vessel as required by the basic specifications. Near the end of this discussion, Jack Toole asked Mr. Strickland if Holpine's and Grinn's comments had the same meaning as Atomic Products' interpretation of the specifications. Mr. Strickland agreed, but was somewhat concerned over the rigid cleaning specification. As he told the group, "It is difficult for a shop our size to construct a temporary building around the pressure vessel, make such a building airtight, and compel our workmen to wear white coveralls and gloves, and to adhere to surgical cleanliness requirements. I doubt if we can erect such a building in our present shop area. Instead, we may add a lean-to to the outside of our existing

buildings.”

The meeting with the production manager lasted one hour; then the group commenced to tour the shop. Grinn noted that most of the machines, such as the vertical boring mill, horizontal mill planer, radial drills, and beam press, were comparatively new and well maintained.

Jack Toole wondered why Atomic Products’ estimated cost was lower than Nuclear Vessels’, yet Atomic Products’ costing rates were somewhat higher. With this thought in mind, he asked Mr. Strickland, “Do you consider your shop to be better equipped than your competitors’?” Mr. Strickland replied that it was their management’s feeling that this shop was the best equipped in the United States to handle such vessels, and that even though the shop rates were higher than other shops, they would turn out more work in less time than any competitor. Holpine asked Mr. Strickland why their past experience was limited to smaller-sized vessels, to which Mr. Strickland replied that they could handle any size vessel up to and beyond the one required by Oceanics, but had never received a contract for such vessels.

Atomic Products Company was a union shop that had had several major strikes during the past few years. There were 2,000 people employed, and the plant covered approximately 470,000 square feet of floor area.

The general appearance of the shop was excellent. The group noticed that the aisles were clean; that there was ample lighting, adequate ventilation, up-to-date laboratories, and good inspection facilities; and that the overall appearance of the building was extremely neat and well ordered.

The group pointed out several items in production and asked Mr. Strickland the ultimate use of these products. They received a vague reply, such as, “These are a number of special jobs we have in the shop that we can handle without any trouble.”

Mr. Strickland interrupted a group of employees standing in a corner and asked one of them to show the group the inspection and quality control departments. Both departments were well staffed and had up-to-date equipment.

The group asked Mr. Strickland to show them control of incoming materials vital to potential Oceanics’ work. Wrong material that might possibly get into such a pressure vessel would contaminate the entire nuclear system. Mr. Strickland did not offer the group any evidence of materials control, but stated that they had produced hundreds of smaller vessels and had no trouble in the segregation of materials.

The metallurgical and chemical laboratories were well staffed and could provide Oceanics with adequate test specimens required by the specifications.

At the end of the tour, the group met with the president, who asked, “Do you think that our facilities are adequate to do the job?” Jack Toole replied that the facilities were impressive, but that the final selection of the supplier would be determined by many factors and that facilities were only part of the total evaluation. The president then replied, “If you want us to do the work, let us know and we will commence contract negotiations.”

Several days later, Messrs. Toole, Grinn, and Holpine left New York and flew to Houston, Texas, for a visit to Nuclear Vessels, Inc. When the group registered in the hotel at 5 p.m., they found a call waiting for them from Mr. Winninghoff, president of Nuclear Vessels. Mr.

Winninghoff asked the group to meet that evening at the Houston Country Club for dinner and business discussions. At 1:30 a.m., the group returned to the hotel.

The following morning, the Nuclear Vessels' chauffeur met Oceanics' team and the representative from Oceanics' sales office at the hotel and took them to Mr. Winninghoff's office. In the office, Mr. Winninghoff was waiting with the vice president of engineering, vice president of marketing, vice president of manufacturing, and other key figures in the organization. Jack Toole opened the meeting in much the same manner as was done at Atomic Products Company. After the Oceanics' people had gone into detail on the vessel, Jack Toole asked Mr. Winninghoff if they had any questions concerning the specifications. There were no comments, so the entire group commenced to tour the shop.

Mr. Grinn immediately noticed that the company's machines were of considerable age and not of large capacity, but adequate for the job. Some outside subcontracting work for the close machining tolerances would be required. Mr. Winninghoff stated: "True, we may not have all the necessary machines here, but there are ample machines available at other divisions, such as the large vertical boring mill at our El Paso, Texas, subsidiary plant. The schedule is such that we can move work into other divisions without delay." It was noted that general working conditions such as heating, lighting, ventilation, and cleanliness were not as adequate as Atomic Products'. Jack Toole noted that the higher estimated cost resulted from more man-hours required to make the vessel because of less adequate machines.

Mr. Winninghoff stopped by one of the shop foremen and asked, "Say, Sam, how about giving these gentlemen from Oceanics an idea of what your group will be doing in the forming and rolling of the pressure vessel?" Sam had several of his men stop work to show the equipment available and its intended use. Mr. Winninghoff mentioned to the group that their plant had been on a profit-sharing plan since it was organized. The employees never organized a union.

There appeared to be effective control between management and the shop. For instance, to carry out the work fully, one member each from supply, expediting, quality control, and scheduling was assigned to a task force headed by a project engineer. It was the responsibility of this task force to follow the entire project through the shop and keep the project engineer informed on a day-to-day basis.

Nuclear Vessels had constructed one vessel considerably larger than the vessel required by Oceanics. Mr. Winninghoff claimed that they ran into numerous problems at the beginning of manufacturing and that the experience gained in the production of such a large vessel made them change their organization for closer follow-up. They also changed the type of paperwork and records for better control of material. The group noticed that each piece of material in the shop was marked for the project of its intended use. The metallurgical and chemical laboratories were very large, but much of their equipment was old. They appeared to have adequate room for the location of a cleaning room.

On Friday of the same week, Toole called a meeting of Holpine and Grinn to evaluate the two companies being considered. Holpine argued strongly that Nuclear Vessels should be given a contract because of their extreme enthusiasm to carry out the job, their past experience in manufacturing pressure vessels of equal size, and their previous Oceanics experience. Said Holpine, "Atomic Products has not had experience with our rigid specifications and the price and delivery will probably slip." Grinn argued that Atomic Products should be the company selected because of their adequate shop and laboratory facilities, location, ability to meet delivery date, and ability to guarantee the vessel.

Neither Holpine nor Grinn took into consideration the cost, the company's organization, guarantees, and other business considerations. It was Jack Toole's responsibility to evaluate both of these companies and show which company should be given the contract.

1. What specific areas and activities should the Oceanics group have investigated on its two visits?
2. Evaluate each supplier on each of the above items using information obtained on the field visits.
3. Based on the face value of the written proposals, which company appeared to submit the better offer?
4. Based on the proposal plus information obtained from the case history, which company is likely to be the better supplier?
5. What do you recommend?