The Mismanagement of A.V. Roe Canada Limited:

Political Influence and Government Dependence

Alexandra Popa

Within thirteen years of its inception in 1945, A.V. Roe Canada Limited (A.V. Roe) became the third-largest Company in Canada[1]. This becomes considerably less impressive when taking into account that four years later, A.V. Roe ceased to operate in the aviation industry[2]. Many have written about A.V. Roe in the context of the highly advanced Avro Arrow interceptor[3], blaming the company's failure on Prime Minister John Diefenbaker's decision to cancel the project. However, what is overlooked, is that the company's failure cannot be reduced to a single event in its seventeen-year history but rather, is a symptom of years of poor managerial decision making. Management's failure to assess the needs of the company and the aviation industry led A.V. Roe down a path of government dependence and political influence. This drastically limited the company's ability to diversify its product offerings, leaving it with no alternatives to turn to once Diefenbaker withdrew government support and funding from the Arrow project.

On March 5th, 1946[4], A.V. Roe entered into a contract with Trans-Canada Airlines (TCA) to produce the Jetliner C-102, a transport aircraft capable of seating thirty people[5]. The letter of intent signed by TCA's President, H.J. Symington, stated that TCA was committed to accepting and purchasing the aircraft as long as cost, performance, and delivery date specifications were met[6]. Particularly, TCA required A.V. Roe to deliver a fleet of at least fifty airplanes priced at a maximum of $350,000 per aircraft on or before the project's deadline of October 1948[7]. Evidently,

---

[1] Whitcomb, Randall. *Avro Aircraft and Cold War Aviation*, (St. Catharine's, Ontario: Vanwell Publishing, 2002), 13.
[2] Chris Gainor, *Who Killed The Avro Arrow?*, (Canada: Folklore Publishing, 2007), 166.
[3] Including James Dow, *The Arrow*, 2nd ed. (Toronto, ON: James Lorimer 1997); Whitcomb, Randall. *Avro Aircraft and Cold War Aviation*, (St. Catharine's, Ontario: Vanwell Publishing, 2002); and Chris Gainor, *Who Killed The Avro Arrow?*, (Canada: Folklore Publishing, 2007).
[4] James Dow, *The Arrow*, 2nd ed. (Toronto, ON: James Lorimer, 1997), 26.
[5] Ibid, 27.
[6] Ibid, 30.
[7] Ibid, 30.

TCA failed to recognize that providing this quotation required a lot of guesswork since no comparable aircraft, using the same level of complex technology, was available to provide a baseline price estimate[8]. The agreement also stated that TCA would make interim monthly payments spanning up to 90 percent of the project's associated development costs[9] with the option to be reimbursed and annul the contract if any of the specified conditions were violated[10]. By making the contract conditional on their cost, performance, and deadline specifications, TCA ensured that they would be in an advantageous position regardless of how the development process played out, a strategy that A.V. Roe management should have considered.

Within twelve months of signing the contract, A.V. Roe determined that there was a slim likelihood of meeting TCA's requirements given increases in the costs of materials, labour, and the Rolls-Royce Avon engines intended to power the Jetliner[11]. With the price remaining at $350,000, the project's profitability was drastically reduced. It was on the basis of increased costs that Fred Syme, Executive Vice President of A.V. Roe, and Walter Deisher, A.V. Roe's General Manager, attempted to renegotiate the contact with TCA. In an effort to convince TCA to absorb some of the risks associated with these increased costs[12], A.V. Roe management presented a cost-estimate schedule which exceeded the agreed upon unit-price of $350,000 by upwards of $200,000 and was anchored to the quantity of aircraft sold[13]. In their proposal, management also requested a four-month deadline extension to February 1949[14]. As this proposal violated two of TCA's

[8] Ibid, 30.
[9] Ibid, 31.
[10] Ibid, 31.
[11] Ibid, 31.
[12] Ibid, 32.
[13] Ibid, 33.
[14] Ibid, 32.

conditions, Symington determined that annulling the contract would be the best course of action for TCA to pursue.

Evidently, management failed to consider the conditions under which the aviation industry operates when entering into a contract with TCA. Primarily, management failed to recognize the frequency and unpredictable nature with which technological changes occur. The ever-present need to keep up with, or stay ahead of, domestic and international competitors requires aviation manufactures to continuously direct funds to research and development. This process is lengthy and unpredictable as it is difficult, if not impossible, to forecast what challenges will present themselves and how long they will delay the manufacturing process. To protect the company from the liability associated with technological difficulties in the development process, it is prudent to set up a contractual provision that permits deadlines to be extended.

Management also failed to recognize that profit margins are generally affected by changes in costs, which is especially concerning when prices of variable inputs, such as materials, tend to increase over time. By taking this into account, it is sensible to explore available alternatives by which the company can hedge some of its associated financial risk. One such strategy would be to set up a forward contract[15] with Rolls-Royce to purchase the Avon engines, thereby enabling the company to conclusively establish the engine's price for a specified number of years. As forward contracts are customizable to the company's needs, management could have also included a provision that permits the settlement date[16] to be revisited in the event of delays in the company's

[15] Stephen A. Ross, Randolph W. Westerfield, Bradford D. Jordan, and Gordon S. Roberts, *Fundamentals of Corporate Finance* (Whitby, ON: McGraw-Hill Ryerson Limited, 2016), 924. A forward contract is, "a legally binding agreement between two parties, calling for the sale of an asset or product in the future at a price agreed upon today".

[16] Ibid, 924. A settlement date is defined as the date that one party must deliver goods to the other.

research and development schedule. As this extension could have resulted in Rolls-Royce incurring additional costs to produce the Avon engine, A.V. Roe management would be required to make the contract attractive to their business partner. In an effort to do so, the deadline extension could be made conditional on Rolls-Royce receiving compensation of an equal amount to the increase in costs that they would incur as a result of this extension.

In the months following TCA's withdrawal from the Jetliner contract, A.V. Roe experienced a great deal of doubt from the aerospace industry concerning their production of civilian aircraft. Specifically, both commercial airline companies and Canadian aerospace regulators came to the conclusion that the Jetliner was not yet ready for civilian use[17]. In reaching this verdict, it was also established that a great deal of money would be needed to perfect the technology required by the Jetliner, thereby making it a project best suited for military budgets and timelines[18]. Despite this, the largest issue in selling the Jetliner came from within the company[19]. Specifically, the root of this problem was Roy Dobson, President of A.V. Roe, who was very reluctant to take on another civilian project without guaranteeing profits for the company[20]. The annulment of the TCA contract made Dobson hesitant to accept subsequent proposals from airline companies[21] due to the fact that they required a fixed price, firm delivery date, and a performance guarantee[22]. In other words, A.V. Roe management became more cautious, preferring to protect the company by means of seeking contracts that were flexible to cost escalation and deadline extensions. Rather than once again being forced to bear all of the

[17] James Dow, *The Arrow*, 2nd ed. (Toronto, ON: James Lorimer, 1997), 34-41.
[18] Ibid, 34.
[19] Ibid, 43.
[20] Ibid, 43
[21] Dobson refused to accept the letter of intent signed by National Airlines to purchase four Jetliners with an option of purchasing a further six (Dow, *The Arrow*, 43).
[22] Ibid, 43

liability themselves, Dobson wanted to ensure that provisions were set up that placed most of the risk associated with design and development on the client, rather than on A.V. Roe[23]. Evidently, the TCA contract instilled a clear preference in A.V. Roe management to do business with the government on a cost-plus basis, putting the company in a position that required exclusive dependence on military contracts.

The onset of the Korean War on June 25, 1950 further drove A.V. Roe down the path of producing military defence aircraft. The Canadian government viewed North Korea's invasion of South Korea as an indication that a general war was being considered by other nations as a means of achieving their foreign policy goals[24]. In an effort to counter and prepare for this possibility, all available resources were diverted to rearmament as defending Canada became an absolute priority[25]. This presented a further barrier to producing the Jetliner as C.D. Howe, Canada's Transport Minister, determined that a fleet of interceptors were required to respond to international threats from Korea, China, and the Soviet Union.[26] As such, the production of the Jetliner was to be pushed back until the crisis passed and A.V. Roe was tasked with the production of an interceptor, the CF-100 Canuck, in large quantities as quickly as possible[27].

Through working on the interceptor project, A.V. Roe dealt extensively with the Hughes Aircraft Company whose President, Howard Hughes, expressed an interest in the Jetliner[28]. Specifically, he wanted his company to produce the aircraft and wanted it to be operated by Trans World Airlines (TWA) under license in the United States[29]. Due to the fact that American factories

[23] Ibid, 43
[24] Ibid, 42.
[25] Ibid, 42.
[26] Ibid, 42.
[27] Ibid, 42.
[28] Ibid, 45.
[29] Ibid, 46.

were preoccupied with military contracts necessitated by the Korean War, the Civil Aeronautics Board did not authorize the Jetliner's production in the United States[30]. Left with no other option, A.V. Roe was asked to use their Canadian facilities to produce thirty Jetliners for Hughes, who promised to finance the entire project[31]. This contract would have provided A.V. Roe with an opportunity to enter into, and perhaps even lead, the commercial jet transport industry. This limited liability project would have enabled the company to diversify their product offerings and achieve financial independence from the government. A.V. Roe's President and General Manager at the time, Crawford Gordon[32], realized that there were opportunities associated with taking on civilian contracts. As such, he hoped that by gaining Howe's approval, A.V. Roe would be able to enter into the commercial airline industry[33].

Unfortunately, Howe felt that the Hughes contract would have diverted A.V. Roe's attention from the production of the Canuck interceptor[34], which was a national defence priority. He stated that the use of A.V. Roe's production facilities for anything other than the development and production of the CF-100 would not be tolerated as long as the government was investing colossal amounts of money into the company[35]. In an effort to gain further control, the Government of Canada sold a $40M engine-manufacturing facility to A.V. Roe for $6M upfront with an agreement that the company would make further payments totalling $11.5M over the next ten years[36]. The nature of this agreement tied A.V. Roe to military defence contracts as the company

---

[30] Ibid, 47.
[31] Ibid, 47.
[32] Crawford Gordon replaced Roy Dobson as President and General Manager of A.V. Roe on October 15, 1951 because Howe felt that, "it was quite obvious that management of the day was not likely to produce what we required" (Dow, *The Arrow*, 43).
[33] Ibid, 46.
[34] Ibid, 47.
[35] Ibid, 47
[36] Ibid, 49.

required the income generated by them to make annual payments towards the facility or else risk the government reclaiming it. In their purchase of the manufacturing plant, A.V. Roe acquired 30-40% of the plant's modern machine tools, with the remainder of the tools to be loaned to the company, free of charge, as long as they were used solely to fulfil defence orders[37]. This deterred the company from exploring alternatives to military contracts since they knew that meeting production requirements and deadlines without this machinery would not be possible. Evidently, the acquisition of this manufacturing plant and its associated technology prevented A.V. Roe from using available resources to diversify their product offerings. This left the company highly vulnerable to changes in government policies and priorities as defence contracts remained their sole source of income.

To further illustrate the dangers of sole reliance on government defence expenditures, an in-depth analysis of the decisions surrounding A.V. Roe's CF-105 Avro Arrow project is required. The Arrow's primary purpose was to "intercept and destroy any long-range bombers [that enemy forces were expected to have in] the next five to ten years"[38]. Pressure from the Royal Canadian Air Force (RCAF) to create an aircraft that was tailored to Canada's unique defense requirements[39] helped advance the project's development as the market did not offer any close substitute to the Arrow at this time[40]. This was the basis upon which management promoted the interceptor to the Canadian government, accentuating its ability to meet Canada's defense requirements. The Arrow met RCAF's specifications of reaching high altitudes very quickly, making it capable of guarding

---

[37] Ibid, 49
[38] Ibid, 85.
[39] Donald C. Story and Russel Isinger, "The Origins of the Cancellation of Canada's Avro CF-105 Arrow Fighter Program: A Failure of Strategy," *Journal of Strategic Studies* 30, no. 6 (2007):
1032, https://journals.scholarsportal.info/pdf/01402390/v30i0006/1025_tootcofpafos.xml.
[40] James Dow, *The Arrow*, 2nd ed. (Toronto, ON: James Lorimer, 1997), 64.

geographical regions that were expected to be highly targeted[41]. Once this project had RCAF's approval, a production schedule was established, requiring A.V. Roe to produce two prototype aircraft within a five-year period[42].

However, once Russia launched Sputnik, the "world's first artificial satellite"[43], on October 4, 1957, the Arrow's effectiveness was called into question. Specifically, the Sputnik launch indicated that if North America was faced with a Russian attack, it would come from space, rather than from a long-range bomber that the Arrow could shoot down. Sputnik's launch and the government's anticipation that Russia would divert their resources from bomber to missile development[44] meant that support was being withdrawn from the Arrow project. Specifically, the launch meant that the bomber threat upon which the Canadian government approved the Arrow project was diminishing, along with the projects practicality, especially when considering its mounting costs. To put things into perspective, the Canadian government spent approximately $99.4M[45] on the Arrow's design and development by early 1957 with a further $146.9M[46] authorized primarily for its development as of February 28, 1957[47]. These expenditures are exceptionally high given that the initial cost analysis submitted by A.V. Roe on September 16, 1954 projected design and development to total $38.75M by the end of the project[48].

---

[41] Ibid, 84.
[42] Ibid, 89.
[43] Steve Garber, "Sputnik and The Dawn of the Space Age," *NASA History*, last modified October 10, 2007, https://history.nasa.gov/sputnik/.
[44] James Dow, *The Arrow*, 2nd ed. (Toronto, ON: James Lorimer, 1997), 118.
[45] The exact amount spend on design and development was $99,351,396 by early 1957.
[46] The exact amount authorized for the Arrow's development as of this date was $146,880,119.
[47] Ibid, 108-109.
[48] Ibid, 91.

It was upon the basis of serious economic and military considerations that Diefenbaker decided to re-evaluate the Arrow project[49] and look into alternatives that were better suited to the country's changing military defense needs. In a meeting with Gordon, Diefenbaker declared that the Arrow project must come to an end because "it [is] going to cost a billion dollars. We have no [export or domestic] market for them, we can't sell them, [and] we don't need enough of them"[50]. As A.V. Roe's proposals to France, the United States, and Britain were refused on the grounds of cost, alternative interceptors, and ambiguity about the long-term viability of the Iroquois engine[51], the company had no means of selling the Arrow. Thus, with no available markets or product offerings to turn to, A.V. Roe was forced to dissolve and transfer all of its assets to its newly formed subsidiary, Hawker Siddeley Canada[52].

Evidently, A.V. Roe's failure can be attributed to the array of poor managerial decisions made throughout its life. In 1946, the company made the mistake of entering into a contract with TCA without having a thorough understanding of the aviation industry and the difficulties associated with producing highly advanced aircraft. By failing to set up provisions that planned for increases in costs and development complications, A.V. Roe found itself in a very vulnerable financial position when TCA withdrew from the contract. Instead of using the TCA contract as a learning opportunity to recognize that provisions could be set up to mitigate the company's risk, management blamed the contract's failure on the civilian aircraft industry rather than on their lack

---

[49] James, Hornick, "Wings Over Canada: Arrows for RCAF Near Costs of Seaway," *The Globe and Mail*, published February 21, 1958, https://search-proquest com.ezproxy.library.yorku.ca/hnpglobeandmail/docview/1287444645/fulltextPDF/22122F6FDE504F74PQ/10?accountid=15182.
[50] James Dow, *The Arrow*, 2nd ed. (Toronto, ON: James Lorimer, 1997), 123.
[51] The Iroquois engine was chosen to power the Avro Arrow (Dow, *The Arrow*, 128).
[52] Chris Gainor, *Who Killed The Avro Arrow?*, (Canada: Folklore Publishing, 2007), 166.

of understanding and preparation. Thus, from that moment onwards, management associated civilian contracts with excessive liability and believed that A.V. Roe's risk would automatically be reduced by favouring government contracts due to their cost-plus nature and deadline flexibility. What management failed to realize was that government contracts come with political influence. In A.V. Roe's case, this influence came through Howe's attempts to prevent its expansion beyond producing military aircraft, thereby forcing the company to solely depend on government defence contracts for its future viability. Thus, once Canada's changing defence needs forced Diefenbaker to withdraw government support and funding from the company, A.V. Roe was left with no alternatives but to cease operations. Given their fate, A.V. Roe's corporate demise should act as a lesson to other companies about the dangers of lacking product diversification and the impracticability of relying solely on one customer for future cash flows.

Word Count: 2,500 words

Notes

1. Dow, James. *The Arrow*. 2nd ed. Toronto, ON: James Lorimer, 1997.

2. Gainor, Chris. *Who Killed the Avro Arrow?* Canada: Folklore Publishing, 2007.

3. Garber, Steve. "Sputnik and The Dawn of the Space Age." *NASA History*. Last modified October 10, 2007. https://history.nasa.gov/sputnik/.

4. Hornick, James. "Wings Over Canada: Arrows for RCAF Near Costs of Seaway." *The Globe and Mail.* Published February 21, 1958. https://search-proquest-com.ezproxy.library.yorku.ca/hnpglobeandmail/docview/1287444645/fulltextPDF/22122F6FDE504F74PQ/10?accountid=15182.

5. Ross, Stephen A., Randolph W. Westerfield, Bradford D. Jordan, and Gordon S. Roberts, *Fundamentals of Corporate Finance*. Whitby, ON: McGraw-Hill Ryerson Limited, 2016.

6. Soshkin, Maksim. "IBISWorld Industry Report 33641aCA: Aircraft, Engine & Parts Manufacturing in Canada." IBISWorld. May. 2017. Web. 4 Nov. 2017.

7. Story, Donald C. and Russel Isinger. "The Origins of the Cancellation of Canada's Avro CF-105 Arrow Fighter Program: A Failure of Strategy." *Journal of Strategic Studies* 30, no. 6 (2007): 1025-1050. https://journals.scholarsportal.info/pdf/01402390/v30i0006/1025_tootcofpafos.xml.

8. Zhaodonga, Huang, Luo Rongxuana, and Jin Jingb. "Development and Production Costs Estimating for Aviation Equipment Based on Uncertainty Design." *Procedia Engineering* 99 (2015): 143-149. http://www.sciencedirect.com/science/article/pii/S1877705814036327.

9. Whitcomb, Randall. *Avro Aircraft and Cold War Aviation*. St. Catharine's, Ontario: Vanwell Publishing, 2002.