

CASE 4

AIRCRAFT REPLACEMENT

BACKGROUND

An O.R. group was formed one year ago at the Government Staff College of Transitalia (GOSCOT). At first the O.R. group was concerned with introducing O.R. into the senior and middle management courses at GOSCOT. O.R. then proposed that they should carry out consultancy projects in government departments and parastatal organisations which also use GOSCOT. This took some time to be accepted as departments and parastatals don't like outsiders to examine their workings. However, recently the President has appointed a Commission on Administrative Efficiency so some departments believe that they would be wise to carry out their own studies before the Commission starts to examine them. O.R. carried out a number of short appraisals and statistical monitoring projects. But the first significant and successful project was carried out for the national oil company, Transitalia National Oil Company (TRANOC). The project was concerned with the expansion of the main oil port. It recommended a number of improvements in scheduling tankers and overcoming bottlenecks in loading and unloading. The TRANOC study was described on the next senior management course at GOSCOT. One of the participants on the course was the Head of Engineering of the Airline Corporation of Transitalia. He seemed very interested in the O.R. approach. As part of the course each participant formulated a project in his work situation. The Head of Engineering described the current debate in ACT about whether to replace aircraft. After the course he persuaded ACT's Managing Director to invite O.R. to look at this problem.

PRELIMINARY WORK

1. MEETING WITH DIRECTOR OF FLIGHT OPERATIONS

The Director tells you that he is most concerned with replacing the elderly Beaver aircraft operating on the main internal route from the capital Douba to the main industrial city of Ebbyville. His department have carried out a preliminary appraisal of possible replacement aircraft and feel that there is a clear-cut case for the new Zippo aircraft to be the replacement. However, each Zippo will cost US\$6 million and the Minister of Finance has been blocking the purchase in the Cabinet on the grounds that Transitalia has a severe shortage of foreign exchange. It is thought that the President favours the purchase of the Zippos for prestige reasons but has not been prepared to overrule the Finance Minister in this case.

2. MEETING WITH THE MANAGING DIRECTOR

You are taken in to meet the Managing Director (MD) as an important formality in agreeing to outsiders having access to the airline. Part of the conversation goes as follows:

MD Welcome. What we want you experts to do is to help us make a case which will convince the Cabinet that Zippos are essential. The Finance Minister keeps on asking the Minister of Defence (ACT's Minister) to produce figures justifying the expenditure. The Minister of Energy is on our side. He sees increase of oil output and increased business activity boosting ACT. Similarly, the Minister of Tourism backs us. But several Ministers such as Labour, Health, Education, and Agriculture oppose spending foreign exchange on new aircraft.

OR Well sir, we will certainly explore the alternatives as objectively as possible but can't say now what will be the result.

MD We have no doubt that Zippos are needed.

OR Is there any urgency in producing the report? At present I am the only O.R. person assigned to this project, and I am not full-time.

MD Yes, there is urgency. We would like to put our proposal to the Cabinet meeting in three weeks.

OR I will do my best.

3. SECOND MEETING WITH DIRECTOR, FLIGHT OPERATIONS

Beavers

The current fleet consists of eight Beaver aircraft. There are two flights every morning from Douba to Ebbyville, and two flights each morning in the opposite direction. The flight takes seven hours. Each aircraft can only take one flight a day because neither airport has modern equipment for night landing and take-off. This is under the Airport Authority which is not controlled by ACT.

Zippos

We could probably operate with two Zippos. They are much faster and would take about four hours on the Douba-Ebbyville route. So if we can achieve a one hour ground turnaround a Zippo could make two flights a day, one in each direction. Since the Zippo has more seats than a Beaver we would have more capacity. The Zippo has 250 seats, the Beaver 150.

4. MEETING WITH HEAD OF ENGINEERING

If the Beavers are not replaced in the next year they will require a major overhaul, with new engines, which will cost US\$100,000 each and prolong their flying life by five or six years. Maintenance costs for the eight Beavers currently total \$3 million a year. We estimate the total maintenance costs for two Zippos to be about the same as for the eight Beavers because they are more complicated and the spares are more expensive.

It has been suggested that the Beavers could be sold to one of Transitalia's neighbours for military use for about \$250,000 each.

5. MARKETING AND SALES

ACT currently averages about two-thirds capacity on the Douba-Ebbyville route. The single one-way fare is \$85. Passengers are about one-third each business people, government officials and tourists. If the oil exploration succeeds in two or three years then we expect the business trade to increase rapidly. Our best hope in the short term would seem to be expansion of the tourist trade but the government tourist board has not been very active in promotion. However, even in the short term, we would expect some increase in revenue if we go for Zippos due to the extra attractiveness of the 4 hour flights compared to the 7 hour ones. It is difficult to estimate this precisely without detailed market research but a 25% increase in sales revenue due to the Zippos should be conservative.

6. FINANCE

Fixed costs, not related to flying, are estimated to be \$2 million a year. Aircrew costs total \$4 million a year. The number of crews could be cut approximately in proportion to the length of flights. Since a number of foreign crew members are reaching the end of their contracts it will be feasible to cut manpower. Fuel costs for the Beavers total approximately \$3 million a year. The fuel costs for the Zippo are estimated to be \$4,000 a one-way flight.

CHANGES IN TERMS OF REFERENCE

After a few days when you have assembled the above information you are called in to see the Managing Director.

MD Several other airlines have put in orders for Zippos. The company has told ACT that if it does not confirm its option within a few days and make a firm offer ACT will go to the bottom of the queue and have to wait at least another two years.

I am going to see the Minister of Defence the day after tomorrow to brief him for the Cabinet meeting on the next day. I must have your report to take with me justifying the purchase of two Zippos.

OR Well I will do my best to give you a preliminary review of the main alternatives based on the information so far.

- To the student:
- A. Make a short report for the MD outlining the main alternatives and the costs and benefits. Consider how existing uncertainties affect your analysis of alternatives.
 - B. Write a note for your OR boss explaining the organisational setting in ACT and how confident you are in your report to the MD and what you would like to do next if more time is given.