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PRIME MINISTER

ROLLS-ROYCE: RJ500

In January 1980, the Government agreed that Rolls-Royce could sign an agreement with three Japanese companies, Ishikawajima, Kawasaki and Mitsubishi, to collaborate on the design, development and launch of a new aero-engine called the RJ500 aimed at the 100-120 seater aircraft market. The Government indicated, and RR accepted, that this did not imply a commitment to full launch of the engine which would need to be justified after consideration of the full technical, market and financial appraisals. In December 1980, the company presented the results of these appraisals to the Department and asked for an indication that, in principle, the Government would approve full launch in due course. However, RR themselves pointed out that market requirements appeared to be changing and that the engine configuration might have to be changed to cover a larger sized aircraft. After inter-departmental consultation, I replied that the case put forward by RR was not satisfactory bearing in mind the substantial uncertainties about the market and in particular the apparently optimistic assumption by RR that they would have to compete with only one of their US rivals GE and P&W. While being permitted modest expenditure on continuing preliminary work up to the end of May, the company were asked to reconsider the project.

2 The Chairman has now written the enclosed letter setting out the company's latest views. In essence, the company admit that,



if anything, uncertainties about the project are now greater partly because it seems probable that the market would prefer both an engine of about the original size (21,000 lbs) and a larger one of 27,000 lbs. As yet there is no clear idea of the relative share of the total market these engines would take, partly because the joint RR/Japanese company have yet to agree on the basic design configuration and partly because RR now accept that both P&W and GE may be in either or both of the market segments for which the RJ500 is aimed. The Chairman is, therefore, requesting approval for expenditure of £10 million in the remainder of the year on further pre-launch development.

3 Before we accept what seems to be a relatively easy decision to postpone the main decision for a few months, a number of important implications of the RR proposal need to be recognised.

4 The company have themselves pointed out that a new engine such as the RJ500 is crucial to their long term survival in the civil aero-engine market, since a decision to opt out of such a major market would be regarded by their competitors and customers as a sign that RR were likely to withdraw from the civil business - an extremely damaging blow to their credibility. We shall, therefore, be faced towards the end of this year, after RR's further work, with a stark decision: either to accept launch of a new engine or family of engines at a cost of some £350 million, probably involving the continuation of the bitter competition



with both GE and P&W which has been instrumental in RR's financial problems; or a scenario which involves RR ending their collaboration with Japan, opting out of the RJ500 market and beginning a gradual rundown of the civil aero-engine business.

5 However, the present uncertainties surrounding the RJ500 project, identified by the Chairman, do provide us with a limited period in which to explore the prospect of a further alternative, namely the involvement of either P&W or GE in the project. There are a number of reasons for suggesting that this is worth considering -

- (a) although the market is so large that both GE and P&W are almost certain to enter, neither is, as yet, committed to a particular engine or partnership;
- (b) the Japanese themselves have authority and funding to launch only the smaller version of the engine. Thus RR's agreement with the Japanese will in any event need some re-negotiation to encompass the higher thrust version;
- (c) at the same time, if the agreement is continued beyond the end of May, the Japanese will be legally debarred from collaborating with others without RR's permission.



6 As you know, there are also wider considerations. RR is the weakest company in an industry dominated by the two US giants, GE and P&W, who are backed by the massive US defence programmes and the huge domestic market for aircraft, and RR's long term prospects for viability as a separate company are doubtful. We are encouraging RR to explore the prospects for securing a profitable business in co-operation or association with one of the US firms.

7 Rolls-Royce are reluctant to do this and we must recognise that such a strategy will have to overcome not only formidable practical difficulties but also the pride and personalities involved. RR will therefore resist also the idea of seeking a US partner on the RJ500 and we must accept that there will be genuine difficulties such as US anti-trust laws, existing bitter competition and practical difficulties of involving a further company in the existing RR/Japanese venture. But I am quite sure that we must take this opportunity to see whether there is such an alternative, which could also lead to the sort of wider association with a major US company which I believe to be crucial to a viable long term future for RR. Moreover, such an opportunity is unlikely to occur again.

Major new engine developments are rare; if RR becomes committed to the RJ500 project without American involvement, the prospects for a wider association will be substantially diminished. I would be reluctant to envisage the expenditure of



large sums of public money in an extremely risky venture, unless I was satisfied that ways of reducing both the costs and risks had been thoroughly examined. I shall need to take a firm line with the Chairman, and in particular resist the idea that bringing another partner to the project will involve too many 'prima donnas'.

8 Subject to your agreement and that of colleagues, I would, therefore propose to respond to the Chairman's letter in the following terms:

- (a) In view of the continuing uncertainties underlined in the Chairman's letter of 9 April, the Government accepts that a full launch proposal by the company or commitment by the Government is not feasible at this time.
- (b) Given the market developments outlined by the company it is understandable that they wish to ensure that the RJ500 is designed in such a way as to meet the full range of market requirements if necessary developing higher and lower thrust versions. The Government believes that any decision to support or approve launch of any version of the RJ500 will need to be taken on the basis of an appraisal of the technical marketing and financial prospects for that



version and any other anticipated versions of the RJ500 project, and subject to the qualifications set out in the next paragraph.

- (c) The Government notes that under the present collaboration agreement with the Japanese their participation in the higher thrust version is not completely assured. Before agreeing to launch any version of the engine the Government would expect the Japanese commitment to the programme as a whole to have been clarified. Moreover, given the commercial dangers of competing with both P&W and GE, it is most improbable that the Government would consider any approval of any launch decision at 6 above, unless RR were able to demonstrate that one or more versions of the RJ500 will also involve participation by one of the major US companies.

- (d) On this basis and understanding, the company has authority to proceed with development funding for the remainder of this year at the rate set out in the Chairman's letter.


- (e) The Government welcomes and attaches great importance to the Chairman's objective of containing this expenditure within the RR cash limit. The Department would want to be



informed as early as possible if this objective was not going to be achieved, and any extension of the company's cash limit would be dependent on evidence of progress towards the wider collaboration set out above.

9. If the above is acceptable to you and to colleagues, I would aim to send a reply on these lines to Lord MacFadzean no later than 14 May.

10. I am copying this letter to members of MISC 22 and Sir Robert Armstrong.

for 
K J

(Approved by the Secretary of State and signed in his absence)

Department of Industry

8 May 1981

ROLLS-ROYCE LIMITED



BY HAND

 SECRETARY OF STATE
FOR INDUSTRY'S OFFICE

The Rt. Hon. Sir Keith Joseph, M.P.
Secretary of State for Industry
Department of Industry
Ashdown House
123 Victoria Street
London SW1E 6RB

TO Mr Maynard	COPIES TO
FOR ADVICE (AND	Ps/NT
DRAFT REPLY IF	Ps/mm
APPROPRIATE)	Ps/sec
PLEASE BY:	Mr Croft
	Mr Carron
	Mr Young
65 Buckingham Gate, LONDON SW1E 6BA	
Telex: 918091 Telephone: 01-222 9020	
ABAP	

9 April 1981

Dear Keith,

RJ 500

TO	FOR ADVICE (AND
COPIES TO	DRAFT REPLY IF
	APPROPRIATE)
	PLEASE BY:

At our meeting on 6 April I mentioned to you the changes which were taking place in the market and in relation to our collaborators and why we are now seeking an interim decision by you on the RJ 500 programme.

2. Our policy stems from these key strategic facts:

- (i) the 120 to 160 seat aircraft for which the RJ 500 is conceived is the only major sector of the civil airlines market for which a modern fuel-efficient aircraft has not yet been launched, and this market is substantial;
- (ii) it is vital that we retain the Japanese collaboration, because the Japanese will emerge as the major supplier of aircraft and engines to the developing nations of the Far East; are determined to participate in a new aircraft; have a large civil airline requirement themselves and influence others; and, if not allied with us, will link with GE (General Electric) or PWA (Pratt & Whitney Aircraft), to our detriment;
- (iii) our basic agreement with the Japanese is uniquely favourable to RR and we could not again negotiate anything like it, if the present arrangement were frustrated;
- (iv) without the RJ 500, RR's civil turbofan engines will have a severely limited future

3. The present arrangements with our Japanese partners provide that the parties have to agree, not later than 31 May, the result of review of the specification of the engine together with the relevant work programme for 1981, and the partners have to advise each other that funding is available for this programme

otherwise the basic agreement lapses unless some means is found to extend the deadline. We know the Japanese are being wooed hard by PWA (and probably GE as well); in particular MHI, the most powerful company in the Japanese partnership, albeit with only a small share in the project, are being tempted by PWA who are casting doubts on our ability to develop a new engine. In order to obviate any risk of RR being supplanted, as well as for the reasons explained below, we are most anxious for RR to be able to complete the agreement on the work programme as quickly as possible and thereby protect the basic agreement.

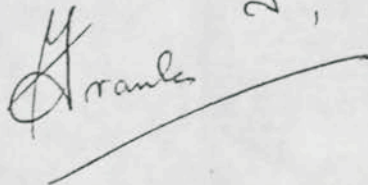
4. Once continuation of the collaboration is assured we and our partners can pursue significant improvements in design of the engine. The original (RB 432) concept for the RJ 500 was for a relatively simple low cost engine, derived from work done on an engine aimed at the business jet market (RB 401). Since then the much greater importance of fuel costs and the anticipation of competitive pressure have led to the need to design a much more sophisticated engine emphasising fuel economy. Thus current work with the Japanese is on a high technology engine of 21,000 lb. thrust aimed at a 120/130 seat aircraft, but with a core and other features which will meet the need for a higher thrust engine such as is likely to be required for a 150/160 seat aircraft.
5. Boeing has now launched the 737-300 to meet the smaller category of aircraft, to be powered initially by the GE/SNECMA CFM 56-3 engine. Boeing, Airbus Industrie, Fokker, the Japanese industry and Douglas are all contemplating new designs of larger 150 seat aircraft, either alone or in combination, and we expect two new aircraft to emerge from this work.
6. Whilst this seems to us the most likely outcome, another possibility is that the 737-300 will be so successful that for some years to come no larger aircraft will be launched and there will then be a large market for this smaller type of aircraft. A third possibility is that sales of the 737-300 will be limited and not warrant the installation of an alternative engine and that the lion's share of the market will then go to the larger aircraft. RR's objective is to be prepared for these possibilities.
7. The position of our competitors is as follows:
 - (a) GE in collaboration with SNECMA have said the CFM 56-3, the 20/21,000 lb. thrust version of the existing engine, is launched on the 737-300 and have announced plans for another higher thrust version which would be virtually a new engine. We do not consider the CFM 56-3 will be competitive with a new engine such as the RJ 500. As the CFM commitments thus far require substantial further investment, there must also be some doubt whether GE will

in the end see a sufficient market in 150/160 seats to justify a new engine.

- (b) PWA have announced plans, with MTU and Fiat, to produce a 26,000 lbs. thrust engine. But if this is a derivative of the PW 2037 (at 37,000 lbs. thrust), it will not be competitive, e.g. on fuel consumption, with a new engine; and if it is to be a scaled version of the PW 2037 or some other form of new engine, PWA will have major problems in launching it at the same time as their PW 2037 programme.
8. We believe this will mean that the RJ 500 is unlikely initially to face more than one competitor in each of the two market segments if such emerge. Our plan therefore is to be able to offer the 21,000 lbs. thrust version for the 737-300, at a launch cost to RR of £200/250m. The higher thrust version, at an additional development cost of £70/100m, would depend on how the market develops.
9. As to profitability, our current estimates of costs and prices indicate that we should be able to achieve a real rate of return in excess of 5% in the light of our confidence in the size of the market and in our ability to design and make an engine at a fully competitive cost.
10. Against this background, there are two outstanding issues with our partners:
- (1) the Japanese approach to their own Government has so far been based on a 21,000 lbs. project, although they have agreed to an engine design with a core suitable for the larger application also. Our first task therefore is to help the Japanese to convince their own Government that the approach as outlined earlier makes market sense and to offer them the opportunity to participate in the larger engine, if it is made, something which we are not obliged to do under the terms of our basic agreement: they, like RR, would face the problem of financing the additional investment;
- (2) however the potentially more contentious issue is that hitherto the collaboration has been based on a two-shaft engine design. After a careful review, we now see significant advantages to RR in designing the RJ 500 as a three-shaft engine like the RB 211. Both concepts will be competitive technically and in terms of cost. The Japanese are aware that we have been taking a hard look at a three-shaft alternative, but they themselves have hitherto been committed to the two-shaft concept and it may be difficult to persuade them to accept a three-shaft

design. We hope to convince them but cannot be certain of success. Should we fail we should wish to continue with the design of the two-shaft RJ 500.

11. So as to ensure that there is no excuse for delay on the part of the Japanese in confirming the agreement for this year's work programme, we judge that we cannot start serious discussions on the eventual higher thrust version of the engine, or any discussions at all on the three-shaft concept until we have eliminated the potential 31 May break-point.
12. The question of full launch of an engine for a first application would then revert to the terms of our basic agreement with the Japanese, i.e. we must jointly decide between now and the end of this year if suitable conditions exist for completing the so-called "launch certificate"; if not, a further postponement would need to be agreed.
13. In this situation we need HMG's support for the work programme after May to proceed to end 1981 at a spend of up to £1½m a month. We would aim to contain this amount within the existing cash limit, although some increase might be needed. Also, if this course is agreed, we would subsequently seek your assistance to have some part of this expenditure, which is principally on demonstrator work, financed by grant or equity rather than loans.
14. Our objective in the coming months is to be able to offer both of these engines to prospective airframe customers on the understanding that these engine programmes will proceed provided that certain launch conditions to be mutually agreed are met.
15. In the light of the situation I explained to you earlier this week, as amplified in this letter, I hope you will agree that it would not have been appropriate or possible to submit a detailed RJ 500 project proposal, as originally contemplated.
16. As the immediate issue is the risk we run of losing the Japanese partnership whose terms are uniquely favourable to RR, I also hope very much that you can give us the required support before we have our next joint Board meeting in Tokyo on 7 May.

Yours sincerely


McFadzean