Algemene Rekenkamer

Status in September 2006

Monitoring the Procurement of the Joint Strike Fighter

Contents

1 Introduction

1.1 Background

In 1996 the Dutch government decided to replace its F-16 military fighter aircraft. In 2002 it identified the Joint Strike Fighter (JSF) as the best aircraft at the best price. It also decided that the Netherlands would participate in the JSF development programme. The Court of Audit is monitoring the Netherlands' participation in the development of the JSF and the preparations for the Memorandum of Understanding on the Production, Sustainment and Follow-on Development phase (PSFD MOU). The Court monitors the status of the JSF and reports to the House of Representatives at set times.[1] This monitoring report describes the status in September 2006.

1.2 Procurement of the JSF

The JSF became a candidate to replace the F-16 as early as 1997 when the Netherlands took part in the Concept Demonstration phase. In 2002, it was decided to participate in the development of the JSF and to take it into production at a later date in cooperation with the United States and the other partner countries.[2]

Since 2001 the aircraft's development has been in the System Development and Demonstration (SDD) phase. In this phase, the very first concept of the aircraft is being worked out and subjected to comprehensive performance testing. The SDD phase is expected to run until 2013.[3] In the meantime, production of the actual aircraft will commence in the PSFD phase (2007-2052). In this phase, the JSF will be taken into production and delivered. The aircraft has not yet been fully developed and follow-on development will be continued throughout the

[1] We sent letters to the House of Representatives on this subject on 15 July 2005 and on 10 January 2006 (House of Representatives, 2004-2005, 26 488, no. 33, and House of Representatives, 2005-2006, 26 488, no. 236).

[2] Australia, Canada, Denmark, Italy, Norway, Turkey and the United Kingdom.

[3] House of Representatives, 2002-2003, 26 488, no. 21.

entire life cycle by means of two-year updates with the latest technical advances.

The House of Representatives approved the Netherlands' participation in the development of the JSF (the SDD phase) in June 2002. This entailed the payment of USD 800 million in instalments to the United States, the government's signing of a co-financing agreement with the Dutch aviation industry and the signing of the SDD MOU. It was projected that the Dutch aviation industry would win JSF-related orders worth USD 10 billion during the production phase.

The United States and the JSF partner countries, including the Netherlands, are expected to sign the Memorandum of Understanding (MOU) on the PSFD phase in the fourth quarter of 2006. With the signing of this MOU, joint production, sustainment and follow-on development will commence. This MOU covers, amongst other things, the pre-production of test and evaluation aircraft, subsequent production in the Low Rate Initial Production (LRIP) and Full Rate Production (FRP) phases, sustainment and later follow-up development (updates).

The total cost of the programme has not yet been estimated. The Ministry of Defence's letter at the start of the project to replace the F-16 in 1999, the 'A letter', noted that the entire project would cost the Netherlands at least NLG 10 billion.[4] The ministry's latest calculations put the expected whole-life cost of 85 aircraft over 30 years at EUR 14.6 billion (2005 prices). The estimated cost of acquisition is EUR 5.5 billion and the estimated cost of operation EUR 9.1 billion.

1.3 Monitoring by the Court of Audit

The Court of Audit monitors:

- the PSFD MOU and the access to information for audit departments (chapter 2);
- the decision-making process from participation in the development of the JSF to actual delivery, including the information provided to the House of Representatives, the US Government Accountability Office's reports on the JSF programme and the business case (chapter 3);
- the receipt of orders by the Dutch aviation industry, partly in the light of the industry's co-financing of the JSF project and uncertainties in the accounting records (chapter 4);

[4] House of Representatives, 1998-1999, 26 488, no. 1.

- the number of aircraft that will be purchased in relation to the development of the JSF's cost to the Netherlands (chapter 5).

In chapter 6 we summarise the conclusions we drew from our monitoring. The Minister of Defence responded to the monitoring report on behalf of himself, the Minister of Finance and the State Secretary for Economic Affairs (EZ) on 4 October 2006. We have summarised his response along with the Court's afterword in chapter 7. The full response is available on our website at www.rekenkamer.nl.

2 Production, Sustainment and Follow-on Development

2.1 Introduction

This chapter considers the Memorandum of Understanding on Production, Sustainment and Follow-on Development (PSFD MOU). The Court of Audit studied the current draft PSFD MOU[5] and found that it contained several improvements on previous versions. One of them is the inclusion of audit rights so that the project can be audited, although there are still limitations. The Court also made a number of critical comments on the draft PSFD MOU. They relate to the risks the Netherlands is exposed to regarding the calculation of the cost price, the agreements on non-recurring costs waivers, the financial cost ceilings and the absence of agreements on a maximum price.

2.2 Cost calculation

It is currently not possible to validate the ultimate cost price of the JSF. The Netherlands relies on the American government for price-related information, in particular on the Department of Defense (DOD).[6] In the Court's opinion, the primary source of this information is the principal contractor, Lockheed Martin. Lockheed Martin is the key link in determining the unit price per JSF, in part because it is building the aircraft on the basis of 'best value'. In practice, as evidenced by the F-16 file, the American government is reluctant to release such information. Although this is no more than 'business as usual', the Court refers to it because the Dutch government decided to participate in the JSF programme on the assumption that it would buy 'the best aircraft at the best price'. It cannot be said that this will remain the case in the years ahead because the price may still change. The price will not be known until the first aircraft are ordered and only then can it be said whether the JSF is better value than an alternative fighter aircraft.

[5] PSFD MOU, 26 September 2006.

[6] PSFD MOU, sections 5.18, 5.19, 5.20 and 5.21.

The Ministry of Defence's audit department also notes that the Dutch Ministry of Defence has not provided information to substantiate the cost of participating in the PSFD MOU (USD 586 million).

2.3 Non-recurring costs waivers

Another concern relates to the non-recurring costs waivers.[7] The partner countries pay part of the development costs in advance (non-recurring costs) and purchase the aircraft at the basic unit price. This price covers, amongst other things, the equipment, man-hours and asset depreciation (recurring costs). Export countries, those that are not participating in the development of the JSF, do not make any advance payments. They buy the JSF off the shelf and pay a surcharge on the basic unit price to cover the development costs per aircraft (non-recurring costs). This surcharge is distributed pro rata to the partner countries in the form of royalties. The MOU signatories, however, may unilaterally decide to waive payment of the non-recurring costs and thus forgo their royalty rights in order to grant discounts to third parties that buy JSF aircraft off the shelf. This might make it more difficult for the partner country concerned to earn back its development costs. According to the latest estimate, the business case allows for EUR 83 million (net cash) on non-recurring cost waivers.

2.4 Financial cost ceilings

The Court of Audit also considers the agreements on financial cost ceilings to be a potential risk. The question is, to what extent are there actually cost ceilings? If expenditure were in danger of breaching the ceiling, the MOU would have to be amended. This would again require a political decision so that the ceiling could be revised upwards.[8] The JSF Executive Steering Board, the main management body, would consider the participants' rights in the period until the MOU was amended. A partner country would have to withdraw from the MOU if it were not amended within 12 months. This would automatically lead to the other participants reaching their cost ceilings sooner and thus being exposed to even greater financial consequences. This would also happen if some of the signatories to the SDD MOU did not sign the PSFD MOU.

[7] PSFD MOU, section 13.11.

[8] PSFD MOU, section 19.5.

2.5 Not-to-exceed price

Finally, the Court of Audit notes that there is no 'not-to-exceed price'. Without such a maximum price, there is a risk of the price continuing to increase. According to the Ministry of Defence, the contracts for the first three test and evaluation aircraft allow for cost increases and reward cost control measures (cost plus incentive fee). Later aircraft will be purchased at a fixed price. The exact price, however, will not be known until the contract is signed and, in the Court's opinion, the actual price will remain uncertain until then. Although the government says it can still withdraw from the JSF project without incurring high costs, it will become more difficult for it to do so as the years progress, especially if substantial sums have been invested in the JSF's development and orders have been placed. The cost of withdrawing will become increasingly higher.

2.6 Conclusions

Although audit rights are improved in the draft PSFD MOU in comparison with previous versions, the Court of Audit notes that there are still significant risks. The limited access to information makes it impossible to validate the cost of a JSF. The agreements on non-recurring costs waivers do not provide assurances on the extent to which the Netherlands will earn back the development costs. Furthermore, when a decision is taken on the MOU it will not be possible to quantify the financial risks attaching to the agreements on cost ceilings and the not-to exceed price.

3 Decision-making process

3.1 Introduction

This chapter considers the House of Representatives' information requirements as laid down in the Large Projects Procedural Regulations, comments made in reports issued by the US Government Accountability Office and the co-financing agreement with the Dutch aviation industry (business case).

3.2 House of Representatives' information requirements

The House of Representatives' information requirements are defined in an agreement dating from 1999. Since then, the project has been through several phases.

The audit departments of the Ministries of Defence and Economic Affairs recommend in their *Report of Findings on the 2005 Annual Reports* that: '(…) the information requirement regarding participation in the SDD phase, as referred to in the letter to parliament of 23 September 1999, should be reconsidered. In particular, consideration should be given to the project definition and the formulation of criteria that determine when the various phases of the "large project" can be closed'. In the audit departments' opinion, the House's information requirements during the development phase should differ from those during the acquisition phase.

The fact that the definition of phases in the decision-making process and the information on them are open to improvement is illustrated by:

- since the decision to participate in the SDD phase (2002), the audit departments have advised the House of Representatives of the importance of its reconsidering its information requirements. The House has not acted on this advice;
- when the decision to participate in the SDD phase was taken in 2002, it was not revealed that development costs might have to be paid during the follow-on development phase. On the contrary, in reply to a question in the House on the benefits of participating in the SDD

phase it was said, 'A better spread of payments is achieved by paying the development costs during the development phase instead of later as part of the overall aircraft price'.[9] The Court of Audit had inferred from this that the Netherlands would pay all development costs during the SDD phase.

3.3 Reports issued by the US Government Accountability Office

The US Government Accountability Office (GAO) has concluded in several reports that the entire JSF programme should be re-assessed.

Conclusion of the GAO in 2005 (GAO-05-271):
Several program changes have made the original JSF business case unexecutable. Since initial estimates in 1996, development costs have grown over 80 percent, or USD 20 billion. Program acquisition unit costs have increased by 23 percent, or USD 19 million, since 2001. In addition, delivery of the first JSFs to the warfighter has been delayed 2 years so far. Continued program uncertainties make it difficult to estimate the resources needed for the program.

Conclusion of the GAO in 2006 (GAO-06-356):
DOD is investing heavily in procuring JSF aircraft before flight testing proves it will perform as expected. … Producing aircraft before testing demonstrates the design is mature increases the likelihood of design changes that will lead to cost growth, schedule delays, and performance problems. Because the program will lack key design and testing knowledge, DOD plans to use cost reimbursement contracts to procure early production aircraft. This type of contract places a substantially greater cost risk on DOD and the taxpayers.

The GAO advised the US Congress to consider delaying authorisations and appropriations for procuring JSF aircraft until the Department of Defense (DOD) had drawn up a new business case and demonstrated that the aircraft design qualities and integrated mission capabilities of the fully configured and integrated JSF variants worked as designed based on actual flight testing. In its response, DOD said account had been taken of the uncertainties described by the GAO. The Dutch Ministry of Defence also said that DOD recognised the risks and had taken appropriate measures.[10] It further noted that the Netherlands' step-by-step procurement strategy, with the possible purchase of three test and evaluation aircraft and follow-on orders, was appropriate to such a risk limitation strategy. The budget includes EUR 317 million (2005 prices) for

[9] House of Representatives, 2001-2002, 26 488, no. 9, p. 10.

[10] Annual report on the replacement of the F-16 for the year 2005 (House of Representatives, 2005-2006, 26 488, no. 42).

the aircraft to be used in the test and evaluation phase in 2007/2012. It also provides for a further 82 aircraft. Having made such an initial investment and clear commitment to the project, in the Court of Audit's opinion, it would be difficult for the Netherlands to withdraw from the project at a later stage on account of the loss of capital (including the SDD contribution of EUR 800 million) and the impact withdrawal would have on the partner countries' costs. Withdrawal, however, remains a legal possibility.

In addition, the GAO writes in a report issued in 2003 that the allocation of development cost increases has not been properly agreed with the JSF partner countries and that the transfer of technological know-how might breach US disclosure policy. The American decision to bear these cost increases has been beneficial to the partner countries.

3.4 The business case and the co-financing agreement

When the decision to participate in the SDD phase was taken, it was said that participation in the JSF's development would not cost the taxpayer more than buying off the shelf would. The 'gap' would be filled by the Dutch aviation industry. A business case was drawn up that concluded that the industry would have to contribute approximately EUR 190 million (cash value). The aviation industry agreed to this approach and signed a co-financing agreement in which it committed itself to remitting to the State part of the revenue it earned on JSF orders. The definitive payment will be set in 2008 (see box).

The essence of the business case[11]

When the decision to participate in the development phase (SDD) was taken in 2002, a business case was drawn up in which all expenditure and income were discounted over time in order to compare participation with buying off the shelf. The business case's calculations assumed that participating in the SDD phase would not cost the taxpayer more than buying the JSF off the shelf. The calculations produced a financial shortfall that was closed by an undertaking by the Dutch aviation industry. The undertaking entails the remittance to the State of a percentage of the ultimate JSF-related production turnover. This undertaking is laid down in the co-financing agreement of 5 June 2002. In 2002 the remittance rate was set at 3.5% until 30 June 2008. It was agreed that the remittance rate for the period from 1 July 2008 to 31 December 2052 would be reset by recalculating the business case in 2008. The ultimate financial shortfall and an updated turnover basis to calculate the remittance would be determined using the information available at that time. The new remittance rate will apply 'for better or for worse' as from then.

[11] House of Representatives, 2002/2003, 26 488, no. 26.

The industry remittance may be made in two ways.
1. The remittance rate applies for better or for worse. The remittance on the turnover at the rate set in 2008 will apply for as long as the industry generates turnover in the defined turnover categories. Under this option, the industry will not close the gap if the relevant Dutch JSF turnover falls short of the estimate made in 2008 but if the turnover exceeds the estimate the industry will remit more than is needed for the business case. In this option both the industry and the government are exposed to risks.
2. The industry closes the gap in the business case by transferring to the government a series of payments set in 2008 in accordance with an agreed payment schedule (linked to the turnover forecasts in the business case). This guarantees that the gap in the business case (as known in 2008) is closed exactly. The amounts are thus for better or for worse.

A key point in the business case is the option of granting 'off the shelf' countries a discount on the development costs (non-recurring costs waiver). The business case assumes that there is a 50% chance of these countries being granted a discount on the development costs even though they have not taken part in the development. The Dutch aviation industry has calculated that, of the approximately EUR 190 million in remittances (cash value) payable for participation in the SDD phase, some EUR 150 million would not have to be remitted if the non-recurring costs were not waived when third countries acquired the JSF. The amount remitted by the industry would then be realistic, regardless of the dollar exchange rate or other variables. The industry would therefore prefer the PSFD MOU to rule out the granting of discounts to off the shelf buyers. The Ministry of Defence says that it will and off the shelf buyers may be granted discounts in certain circumstances. The industry fears that if non-recurring costs are waived the remittances will be so high that it will be unable to pay them. According to the Ministry of Defence, this fear is groundless because the discount for off the shelf buyers will increase sales and thus the industry's turnover and the government's recoupments. According to the Ministry of Finance, the industry must settle the remittances regardless of the impact of the non-recurring costs waiver. This is laid down in the co-financing agreement. The ministries concerned consider the co-financing agreement to be watertight. The Court of Audit is unable to verify this since this phase has not yet started.

3.5 Conclusions

The Court of Audit found that the supply of information to the House of Representatives could be improved, particularly with regard to the definition of the phases in the decision-making process. The House of

Representatives itself should state what its requirements are in this respect. The US Government Accountability Office has concluded that the entire JSF programme should be re-assessed and advised the Senate to postpone authorisations and appropriations for procurement until the US government has drawn up a new business case. With regard to the Dutch business case and the co-financing agreement, the Court of Audit notes that there is no insight into the size of the remittances from the aviation industry or into the risk that the industry and thus the government run in respect of cost control. Such insight will not be available until the co-financing agreement is reviewed in 2008.

4 Orders for the Dutch aviation industry

4.1 Introduction

This chapter considers the volume of orders the Dutch aviation industry will win, the accounting records for the orders and their supervision.

4.2 Indication of the volume of orders

Companies in the partner countries can be awarded orders during the JSF programme's various development and production phases. For the Dutch aviation industry, orders in the production phase (which has the largest numbers of aircraft in turnover terms) are the most important.

4.2.1 Industry vision

The JSF project cannot be considered without reference to its genesis. After the collapse of Fokker, in 1996 the government decided with the House of Representative's approval to actively support the Dutch aviation industry. This decision[12] led to an incentive scheme whose purpose, according to the industry, was to sustain a flourishing industry with many spin-offs for other technologies. If the government had not offered this support, the industry would no longer be of any importance. The decisions to participate in the SDD and subsequent phases of the JSF should be seen in this broader setting. According to several industry representatives, participation will safeguard the continuity and growth of the Dutch aviation industry.

It has been learnt from the industry that the JSF project has a far more favourable payback ratio than other defence projects. According to the industry it might be as much as 200% (aircraft cost about USD 4 billion and will generate orders worth about USD 8 billion to the industry). Proof

[12] In practice, this decision is also known as the double decision because it provides support to two large aircraft projects, the A380 and the JSF.

of a direct causal relationship between participation in the JSF and turnover or spin-offs, however, is very hard to furnish.

The Netherlands Agency for Aerospace Programmes (NIVR) issued a report in August 2006 on the impact of participating in the production of the JSF. It concluded that Dutch companies involved in the development of the JSF had made significant investments in research and development and had therefore contributed to the growth of the Dutch knowledge-based economy. Given current estimates of the number of aircraft that will be produced and the associated development costs, the NIVR also thinks participation will act as a major stimulus to knowledge innovation.

In addition, participation in the development phase can be regarded as quality enrichment. It contributes to the accumulation of technologically innovative knowledge and bolsters the industry's reputation for technologic excellence. With one exception, most companies think this project will meet their expectations.

4.2.2 Orders in the SDD phase

When it was decided to participate in the development phase of the JSF (the SDD phase) in 2002, the Ministry of Defence thought USD 800 million would be won in orders during this phase.[13] Towards the end of 2003, however, it emerged that the principal contractor in America had also included LRIP turnover in this USD 800 million.[14] The House of Representatives was informed but was not told what part of the USD 800 million in orders related to the SDD phase and what part to the LRIP phase. According to Defence and Economic Affairs, most of the orders for the SDD phase had been placed by July 2006. In answer to parliamentary questions (26 488, no. 43), it was confirmed that development orders had now largely been placed. LRIP orders will certainly increase during the SDD phase, particularly as the American government and Congress release the LRIP funds. Development contracts can still be placed during the SDD phase until 2013 but it is unlikely that Dutch companies will benefit, as acknowledged in response to the parliamentary questions.

In the same parliamentary paper, the Ministries of Defence and Economic Affairs indicated that Dutch companies had won SDD orders worth USD 310 million and LRIP orders worth USD 320 million.

[13] House of Representatives, 2001-2002, 26 488 no. 9, p. 63.

[14] House of Representatives, 2003–2004, 26 488, no. 21. p. 5.

Date	SDD orders expected	Actual SDD orders (balance)
February 2002	USD 800 million	--
Year-end 2003	Less than USD 800 million	USD 205 million[15]
Year-end 2004	-	USD 202 million[16]
Year-end 2005	-	USD 310 million[17]
May 2006	-	USD 310 million
September 2006	-	USD 310 million

The orders expected during the SDD phase are indicative of the number of orders that will be placed during the production phase. When it was decided to sign the SDD MOU (in 2002), Defence and Economic Affairs said that the knowledge and experience gained by the companies participating in the development phase would put them in a better position to win orders during the production phase.[18] The draft PSFD MOU also specifically states: 'Industries in nations of Participants procuring JSF air systems that were awarded SDD subcontracts will normally also be awarded subcontracts for low rate initial production and full rate production work...' (point 7.3).[19]

Given the development of SDD orders as described above, the benefits of the production phase to the Dutch aviation industry should be worked out. The amount paid for participation, according to the industry, might act as a cost barrier that prevents orders being won on the basis of best value.

4.2.3 Volume of orders for total number of aircraft to be produced

In 2002 the total volume of orders that would be placed with Dutch companies for the production phase was valued at USD 8 billion. In 2006, too, Defence and Economic Affairs expressed their confidence in the feasibility of a production turnover of USD 8 billion. On both occasions, the principal contractor was quoted as projecting a total production run of 6,000 JSFs. In 2002, Defence and Economic Affairs had assumed that 4,500 JSFs would be produced. This figure of 4,500 underpins the Dutch aviation industry's obligation in the business case to contribute to SDD

[15] House of Representatives, 2003-2004, 26 488, no. 19 (annual report 2003).

[16] House of Representatives, 2004-2005, 26 488, no. 32 (annual report 2004). Of the USD 202 million, USD 10.7 million relates to LRIP orders.

[17] House of Representatives, 2005-2006, 26 488, no. 43 (annual report 2005).

[18] House of Representatives, 2001-2002, 26 488, no. 8, p. 11.

[19] Concept PSFD MOU, 30 June 2006.

participation but it is also indicative of the volume of orders it might receive. In January 2005, Defence and Economic Affairs confirmed that the conservative figure used to calculate the business case (4,500 aircraft) was unchanged and 1,390 aircraft would be exported to non-partner countries.[20] At least 3,110 aircraft would therefore be produced under the MOU. The draft PSFD MOU includes a production volume of 3,173 JSFs, of which 730 are for partner countries and 2,443 for the United States. This production volume in the MOU implies that 1,327 (4,500 – 3,173) aircraft would have to be bought off the shelf. The PSFD MOU contains no information on this.

The audit departments note in their *Report of Findings on the 2005 Annual Report* that the safety margin in the conservative estimate of 4,500 aircraft has 'now almost disappeared'.

4.2.4 Turnover framework in the PSFD MOU

In the Industrial Participation section, the PSFD MOU sets out the intentions but not, for example, the frameworks or ratios that will be used to allocate orders among the partner countries. This is logical because the JSF partnership seeks to encourage competition between industries in the partner countries on the grounds of best value. However, the partnership creates certain expectations that cannot be met in this way. The Ministry of Defence explained that the MOU includes a cost allocation ratio that does not correspond precisely to the allocation of orders to the industries in the participating countries.

4.3 Uncertainties in the accounting records for the various phases

The Netherlands is obliged to contribute to the development costs incurred in the USA in both the SDD phase and the Follow-on Development phase. The Dutch aviation industry must repay part of the contribution to the SDD phase in proportion to the JSF production orders it receives. The industry need not pay back the State for the contribution to the Follow-on Development phase. The audit departments of the Ministries of Defence and Economic Affairs wrote in their *Report of Findings on the 2005 Annual Report* that the principal contactor and the JSF Program Office should account for the costs incurred in the various phases separately in order to prevent inter-budget transfers. Such

[20] House of Representatives, 2004-2005, 26 488, no. 26.

transfers would have consequences for the payments made by Dutch companies.

The Ministries of Defence and Economic Affairs recognise the importance of accounting for the costs separately. Their audit departments note that follow-on development of the initial design will commence during the SDD phase. Without further measures, it would be possible to use the follow-on budget in the SDD phase. Keeping separate accounts for the budgets and regular audit by the American audit institutions subject to review by the JSF partner countries, however, provide the Dutch government with sufficient assurances that budgets will not be used improperly. The Court of Audit notes that the JSF partner countries' ability to review audit institutions in the US is limited 'to the maximum extent permitted within its national laws, regulations, and disclosure policies'.[21] This proved to be a serious obstacle in the case of the F-16.

4.4 Supervision

The audit departments of the Ministries of Defence and Economic Affairs do not express an opinion in their assurance in the *2005 Annual Report* regarding the completeness of the orders won by the Dutch aviation industry. The orders reported, however, are qualified in the assurance as 'accurate'. The Ministry of Economic Affairs is confident that the information is complete because:
a. it is in the interests of the principal contractor in the US to make orders granted to Dutch companies as widely known as possible, and
b. these orders are then verified at the Dutch companies.
According to Economic Affairs, moreover, the companies concerned form a very transparent group. The orders received by the aviation industry are of importance to repay the contribution to the SDD phase.

The Ministry of Economic Affairs has not yet drawn up a protocol to audit the proportion of turnover that the industry will remit as from 2007. The audit departments note that the audit protocol should emphasise the importance of making a clear distinction between SDD orders and LRIP orders in the accounts of the parties to the co-financing agreement. When asked, the Ministry of Economic Affairs declared it would draw up an audit protocol before the end of 2006.

[21] See PSFD MOU sections 5.18-5.21.

The audit departments of the Ministries of Economic Affairs and Defence write in their *Report of Findings on the 2005 Annual Report* that no assurances can be given regarding the forecasts, projections and assumptions applied in respect of forward-looking information on costs, income and plans. The audit departments are therefore unable to express an opinion on whether the expected outturn will be the actual outturn.

4.5 Conclusions

The Dutch aviation industry appreciates the support it is receiving from the JSF programme. The project seems to have a positive payback ratio and adds to a technologically advanced industry.

It was found in 2006 that the volume of orders won in the SDD phase was less than the volume originally expected in 2002 (USD 310 million versus USD 800 million). The Court of Audit also found that the expected total number of aircraft had declined in recent years. The current expectation (4,500 aircraft, of which 1,327 for export) is approaching the conservative estimate in the Dutch business case. The Court wonders whether the correct calculation of the costs in the various phases of the programme is guaranteed and whether accounting records are accurate enough for the Netherlands to receive the correct payments from the industry.

5 Number of aircraft for the Netherlands

5.1 Introduction

On signing the PSFD MOU and thus agreeing to participate in the production of the JSF aircraft, the partner countries must make a realistic estimate of the number of aircraft they will order in the future. A realistic estimate can then be given of the unit cost per aircraft, the production capacity can be calculated and the contribution to the joint costs can be allocated proportionately. Later departures from this estimate of the ultimate number of aircraft will involve costs. The MOU states that a partner country may end its participation in the programme at any time but it must settle the costs that would be incurred in the regular planning schedule in the subsequent 90 days. If the Netherlands were to end its participation during the aircraft production period, it would have to pay the costs arising from its premature withdrawal from the contract. These would include administrative costs incurred to change the production planning and to seek a new buyer for the aircraft ordered.

5.2 Number of aircraft to be purchased not known

In the B/C letter of 11 February 2002 (House of Representatives 26 488, no. 8), the Ministry of Defence stated that participation in the SDD phase of the JSF programme was a de facto choice for the JSF if only because of the high level of investment. It also wrote that there would be a permanent need for manned fighter aircraft. The ministry could not say precisely how many aircraft would be purchased. It would be more appropriate to do so when the purchase decision was taken, using the information available at that time. The ministry also said that if the budget were to remain more or less unchanged and the price of the aircraft were to increase, fewer aircraft might be purchased.

All subsequent annual reports from the Ministry of Defence to the House of Representatives stated that the number of fighter aircraft it would purchase was not known; it would be decided at the time of the purchase

decision. The purchase of the first three test aircraft is planned for 2007 and the order for the first batch of aircraft is planned for 2010.

Interim calculations and input data for the business case are based on an indicative number of 85 aircraft. In the consultation memo on the decision to participate in the SDD phase (2 April 2002) the Minister of Finance stated that ordering fewer than 85 aircraft would be detrimental to the outcome of the business case and the industry would not be willing to bear the resultant additional costs.[22]

The Ministry of Defence's audit department has found no reason not to use the calculation model to determine the financial consequences. The audit department has not audited the estimates and assumptions underlying the information on the costs. Independent bodies such as the Netherlands Organisation for Applied Scientific Research (TNO) and the Netherlands Agency for Aerospace Programmes (NIVR) have audited them, however.

5.3 The Netherlands' ambitions and needs

The Royal Netherlands Air Force has calculated that 114 aircraft are needed to guarantee the Netherlands' participation in future peace missions. The calculation model used and the results have been checked by TNO and the National Aerospace Laboratory (NLR). The Ministry of Defence then said that, given the indicative price of an aircraft in 2002, 114 fighter aircraft exceeded the ministry's financial framework. The framework it used, the project or procurement budget, had a planned volume of EUR 4.6 billion. This budget was later been increased to EUR 5.5 billion.

To replace the F-16 within the set project budget, the ministry has adjusted its needs to fit the parameters of its ambition level. The new requirement is for 85 fighter aircraft.[23]

5.4 Costs

The US Government Accountability Office (GAO) found in its audit of March 2006 that the development costs for the project as a whole had

[22] House of Representatives, 2001-2002, 26 488, no. 12.

[23] This number of 85 aircraft is based on 2002 prices and was used in the calculations in the business case.

risen by more than 23% since the start of the SDD phase (2001) and by more than 80% since the initial estimate in 1996. It also noted in March 2006 that there was no insight into the further development of costs because more than 90% (September 2006: 65%) of the test phase still had to be carried out. According to the GAO, further development of the fighter aircraft will overlap the production phase, which usually leads to considerable planning and cost overruns (GAO-06-356).

5.5 Delivery priority

The JSF aircraft will be developed and delivered in blocks corresponding to the aircraft's development and production phases. The first test and evaluation aircraft will be delivered in the block 1 and block 2 configuration. The Ministry of Defence intends to order the first three aircraft for test and evaluation purposes in 2007/2008. By ordering several aircraft at an early stage in the process, the Netherlands will be able to participate in the operational test programme and so determine whether the aircraft will meet the set requirements. According to the Ministry of Defence, the operational concepts can then also be tested and further developed so that the Netherlands will be prepared when the aircraft is introduced and ultimately brought into service. It also provides an opportunity for the support staff to gain experience so that they will have the know-how needed to act as 'quartermasters' for the JSF's introduction in the Netherlands. This will reduce risks when the aircraft is introduced in the organisation. According to Defence, this approach proved successful for the introduction of the F-16.

5.6 Useful life

The JSF's life has been set at 30 years. This useful life of 30 years applies to each individual aircraft. In view of the replacement period of ten years (2011-2020) and that fact that certain investments must be made three years in advance, expenditure on the JSF will be required from 2007 until the end of 2052. The value for money study considers the budget necessary for both investment and operation for the period 2007-2052. The Ministry of Defence has calculated the expected whole-life cost of 85 aircraft over 30 years at EUR 14.6 billion (2005 prices). This EUR 14.6 billion is made up of acquisition costs and operating costs. The Ministry of Defence has budgeted EUR 5.5 billion for the acquisition, based on the JSF Program Office's most recent estimates of the price per aircraft (consisting of 85 aircraft at USD 46.7 million each), unit recurring flyaway (URF) and the planned 2005 dollar exchange rate of EUR 0.83. Operating

costs are budgeted at EUR 9.1 billion. The Court of Audit has not audited the supporting evidence for these arithmetical estimates. The extent to which overruns of the estimated development costs will be recovered from the whole-life cost is also not known.

5.7 Conclusions

The number of aircraft that the Netherlands intends to buy is shrouded in uncertainty. The Court of Audit found that the ministries concerned used an estimate of 85 aircraft. This total of 85 aircraft will provisionally be maintained as an indication of the capacity the Ministry of Defence thinks it will need at the beginning of the 2020s on the basis of current insights. A lower estimate would have an adverse impact on the outcome of the business case. With regard to the costs, the Court notes that there has been a considerable increase (23%) since the start of the SDD phase. There is no insight into the further development of costs because a considerable part of the test phase (65%) must still be carried out. There is also no insight into the whole-life cost of an aircraft.

6 Conclusions

As indicated above, the Court of Audit's monitoring concentrates on:

- the PSFD MOU and access to information;
- the decision-making process;
- the receipt of orders by the Dutch aviation industry;
- the number of aircraft that will be purchased by the Netherlands.

With regard to the PSFD MOU, the Court of Audit notes that there are still considerable risks. Limited access to information prevents validation of the cost price of a JSF aircraft and the non-recurring costs waivers, the agreements on the cost ceilings and the absence of a not-to-exceed price create uncertainty about whether the development costs will be recouped. There are thus considerable financial risks that cannot be quantified during the decision-making process for the MOU.

With regard to the decision-making process, the Court notes that the supply of information to the House of Representatives is open to improvement. The House has not yet taken the initiative to improve it. In particular, information on the definition of phases in the decision-making process should be improved. Furthermore, the business case and the arrangements in the co-financing agreement provide no insight into the size of the payments to be made by the aviation industry and the cost control risks to which the industry and thus the government are exposed.

With regard to the receipt of orders by the Dutch aviation industry, it can be concluded that the industry appreciates the support that the Dutch JSF programme offers. The volume of orders received during the SDD phase, however, was lower in 2005 than expected (USD 310 million versus USD 800 million). Some compensation will be provided, though, in the form of development orders during the LRIP phase of USD 320 million.

The expectations on the total number of aircraft that will be produced have been scaled down in recent years. The current expectation is approaching the conservative estimate in the Dutch business case, in which export to third countries is still uncertain. There are also uncertainties in the separation of the accounting records for the various phases of the JSF programme and the Netherlands' supervision of the

payments made by Dutch industry. It is therefore uncertain whether the costs are allocated to the various phases correctly and whether the payments the Netherlands receives from the industry are correct.

Regarding the number of aircraft that the Netherlands will purchase, the Court notes the following uncertainties. It found that the ministries concerned use an estimate of 85 aircraft, which is based on a downward revision of the number required. With regard to the costs, the Court notes that there has been a considerable increase (23%) since the start of the SDD phase. Furthermore, there is no insight into the further development of costs because a considerable part of the test phase (65%) must still be carried out. There is also no insight into the whole-life cost of an aircraft.

7 Response of the minister and the Court of Audit's afterword

7.1 Response of the Minister of Defence

The Minister of Defence responded to the Court of Audit's monitoring findings on behalf of himself, the Minister of Finance and the State Secretary for Economic Affairs on 4 October 2006. His response is summarised below. The full response can be found on our website at www.rekenkamer.nl.

In his response, the minister writes that large projects offer opportunities but there are also risks. The Ministry of Defence does all it can to limit the risks and takes risk management measures. Participation in the development phase of the JSF at a fixed cost of USD 800 million, for example, limits risks since cost increases during this phase are not charged to the partner countries but are borne in full by the United States. Moreover, a business case has been drawn up to compare participation in the aircraft's development with buying off the shelf. The underlying principle is that participation may not be more expensive to the taxpayer than buying off the shelf. This comparison resulted in a net cash deficit to the disadvantage of the development phase. A co-financing agreement was drawn up under which the aviation industry undertook to make up for this deficit by remitting a percentage of its JSF-related turnover. It was also agreed that a recalculation would be made in 2008 and, under the co-financing agreement, the Dutch industry undertook to make up for any remaining deficit. The risks to the government are therefore limited to the recalculation, after which it is 'for better or for worse'. The arrangement is not open ended since the risks are clearly managed.

The minister also notes that the Production, Sustainment and Follow-on Development phase is foreseen after the development phase. Partners from the development phase have agreed the rules for the next phase in the multilateral PSFD MOU. This MOU includes cost ceilings that can be breached only with the approval of the participating countries under the leadership of the JSF Executive Steering Board (JESB). These ceilings, the procedures in place to prevent overruns and the fact that the Netherlands

sits in the JESB together form a set of risk limitation measures. Legislation and regulations in the partner countries, particularly in the United States, however, make it difficult to validate the cost price information even with the PSFD MOU, according to the minister, because the information concerned is usually corporate information that is sensitive to competition.

With regard to the decision-making process, the minister notes that the Ministry of Defence informs the House of Representatives about the project in writing in accordance with the clearly defined steps in the Defence Material Process. Since the project also falls within the scope of the Large Projects Procedural Regulations, the Ministries of Defence and EZ submit a report to the House each year. The ministries' audit departments have advised the House in several reports on the annual reports that is should reconsider its own information needs. The House has not yet acted on this advice.

In respect of the orders for the Dutch aviation industry, the minister notes that Dutch companies have already been granted orders worth USD 700 million. Given the results achieved, the insight provided by Lockheed Martin and verification at the Dutch companies, the turnover outlined to the House seems feasible. The expected turnover is based on the number of aircraft included in the business study, 4,500. In addition, the nature of the orders, the degree of innovation, the technological standard and the spin-off and spill-over are important to the Dutch government.

In response to the US Government Accountability Office's observation that the aircraft is still far from being fully developed, the minister notes that the JSF procurement strategy is based on a block plan and provides for a step-by-step development process that is in keeping with the technical risks and with the cost and planning risks. This strategy matches the American procurement decision and the Government Accountability Office's recommendation to follow a step-by-step, knowledge-based evolutionary procurement strategy. According to the Pentagon, there is therefore no reason to delay production planning in response to the Government Accountability Office's report.

Regarding the test phase, the minister notes that tests with the JSF are progressing satisfactorily. An important milestone has been reached in that the first aircraft has passed from the development phase and is ready to begin the test phase.

7.2 Court of Audit's afterword

With regard to the receipt of orders by the Dutch aviation industry, the Court of Audit notes that the original target was to win orders worth USD 800 million during the SDD phase. At the end of 2003, it was found that Lockheed Martin had included LRIP turnover in this sum. A further allocation of this turnover to the two phases has not been made.

The industry does not make payments on the SDD orders but on the LRIP and FRP orders. The allocation of development and production costs to these phases must therefore be very accurate. We think it is important that the allocation of these costs should be clear.

Despite all the measures taken to limit risks, the Court of Audit still maintains that there are financial risks on account of the non-recurring costs waivers and the financial cost ceilings.

Appendix 1 Abbreviations

ADD	Ministry of Defence audit department
CDP	Concept Demonstration Phase
DOD	Department of Defense (USA)
EZ	Ministry of Economic Affairs
FRP	Full Rate Production
GAO	Government Accountability Office (US supreme audit institution)
JSF	Joint Strike Fighter
LRIP	Low Rate Initial Production
MAD	Ministry audit department
MOU	Memorandum of understanding
PSFD	Production, Sustainment and Follow-on Development
SDD	System Development and Demonstration
URF	Unit Recurring Flyaway