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THE JOINT STRIKE FIGHTER PROJECT

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ISSUE DEFINITION

Canada is a partner in the multinational project to develop a new generation of fighter-bomber called the Joint Strike Fighter (JSF). While it has not yet made a commitment to replace its CF-18 fighters, Canada will share with allied countries the development costs and the industrial and technological benefits associated with the biggest and most expensive combat aircraft project in history. This paper examines the implications of the JSF project for Canada's defence policy and economic development.

BACKGROUND AND ANALYSIS

A. Origins of the JSF Project

The JSF project is the result of the Joint Advanced Strike Technology (JAST) and other programs undertaken by the U.S. military in the 1990s to develop a new generation of fighter-bomber. The new aircraft will replace the F-16s and A-10s of the U.S. Air Force, the AV-8B Harriers of the U.S. Marine Corps, and early versions of the U.S. Navy F/A-18, similar to Canada's CF-18s. Although still effective, the old aircraft have been in service since the 1980s and most will reach the end of their service life around 2015.

The goal of replacing many types of aircraft with just one design will not be fully achieved, since there will be three versions of the JSF. The U.S. Air Force will have the basic version, while the U.S. Navy will operate a reinforced model capable of withstanding the rigours of take-offs and landings on aircraft carriers; the U.S. Marine Corps will use the short-take-off-vertical-landing (STOVL) variant. Furthermore, the U.S. military will continue to operate other types of fighter aircraft, such as the F-22 under development for the U.S. Air Force. Nevertheless, since the three services plan to acquire a total of almost 3,000 JSF aircraft with

basically identical airframes, engines, and cockpits, there will be economies of scale in terms of pilot training, production, and maintenance costs. The U.S. Air Force made a commitment to acquire 1,763 aircraft, while the U.S. Navy and the U.S. Marine Corps planned for 480 and 609 respectively.

Given the total estimated costs of the project – some US$200 billion – and the risks involved in developing new technologies, the final JSF design was selected following a complex evaluation process. This included flight tests of aircraft constructed by the manufacturers competing for the production contract, the Boeing Company and Lockheed Martin Corporation, to demonstrate the capabilities of their proposed designs. On 26 October 2001, the U.S. Department of Defense announced that the Lockheed Martin F-35 had been selected as the JSF. Production of the F-35 is slated to start around 2008.

B. Partnership With Allied Countries

Saddled with the burden of developing many costly weapons systems, the United States encouraged allied countries to buy the JSF or at least become partners in the project. Foreign orders could push total production to between 5,000 and 6,000 aircraft and help keep costs per unit within affordable limits for the United States and allied countries. The current goal is to keep the costs to between US$37 million and US$47 million per unit. Another advantage of sales of JSF aircraft to many NATO countries is the strengthening of interoperability between U.S. and allied forces. Even without a clear commitment to buy the JSF, allied countries can contribute funds to cover the development costs and thus ease the financial burden on the United States. In return, they can have some influence on the design and capabilities of the aircraft while improving the chances of companies within their borders of winning contracts for research and the production of components.

In the late 1990s, a number of countries expressed interest in the project. The United Kingdom made the strongest commitment by announcing its intention to purchase 150 aircraft to replace its Harriers. At the beginning of the decade-long System Development and Demonstration (SDD) phase in January 2001, it confirmed its acquisition plans as well as its participation as a Level 1 partner. Level 1 partners contribute over US$1 billion, while those at Level 2 provide between US$800 and US$1 billion; those at Level 3 give about US$150 million. The United Kingdom’s announcement came at a critical time for the JSF project because, like

other major weapons projects, its future was uncertain while the Bush Administration reviewed U.S. defence policies. However, by the end of 2001, especially in the wake of the 11 September attacks, it was clear that the United States remained committed to the JSF. As a result, many other countries decided to participate in the SDD phase.

C. Canada's Participation

Canada's participation began in 1997, when it gained the status of informed partner upon making a US$10 million commitment to Phase 1, the Concept Demonstration Phase. Unlike the United Kingdom, Canada did not announce plans to buy the JSF since its CF-18s are expected to remain in service until about 2017. Indeed, the radars and other systems of the CF-18s are currently being modernized to ensure that the aircraft can effectively carry out operations for another decade.

Since any decision on the replacement of the CF-18s will not likely take place for many years, public statements by Canadian government and military officials concerning the JSF have been few. Nevertheless, they have indicated Canada's strong support for the project. On 6 December 2001, Art Eggleton, then Minister of National Defence, mentioned the JSF during a speech to the Toronto Board of Trade. He noted that Canada's participation in Phase 1 had granted it access to useful technical data and had resulted in some contracts for Canadian companies. He also indicated his intention to recommend to Cabinet that Canada participate in the next phase on the grounds that, in the early stages, this could result in some $350 to $450 million in contracts for Canadian companies and generate 3,500 to 5,000 person-years of employment. Over the life of the project, it is estimated that Canadian companies could potentially obtain between $8 to $10 billion worth of contracts resulting in 50,000 to 65,000 person-years of employment.

Cabinet approval paved the way for the negotiation of a memorandum of understanding (MOU) between Canada and the United States concerning Canadian participation in the SDD phase as a Level 3 partner. The MOU was signed on 7 February 2002 by Allan Williams, the Assistant Deputy Minister (Materiel), Department of National Defence, on behalf of the Minister of National Defence, and Edward C. Aldridge, Jr., Under Secretary of Defense for Acquisition, Technology and Logistics, on behalf of the U.S. Secretary of Defense. Under the MOU, the Department of National Defence will contribute US$100 million as its share of the

project costs while providing the resources of any Canadian test and evaluation facilities that might be used, as well as some personnel to the JSF Program Office. Technology Partnerships Canada will also provide US$50 million in funding for contracts, while the Canadian Commercial Corporation will make its services available. The Department of National Defence can withdraw from the MOU if it decides that the level of Canadian industrial participation in the project is not satisfactory.

D. Potential Economic and Military Impact

In the short term, Canada's participation is mainly driven by the desire to ensure that Canadian companies will be able to win a share of the contracts associated with such a major multinational project. Over the years, Canadian companies have won many contracts to supply components for various U.S. military equipment projects, but since the end of the Cold War they have faced stiffer competition from foreign defence industries. If Canada had declined to participate, Canadian companies probably would have had few chances to obtain contracts, especially if the number of foreign partners continued to grow. Instead, Canada not only became a partner, but also joined the project in the early stages, thereby maximizing the time Canadian contractors will be involved in the development and production phases of the aircraft.

While the potential economic and technological benefits are significant, it remains to be seen exactly how much in terms of contract value and person-years of employment Canada or other countries will actually gain from participation in the JSF project. Some analysts have argued that the economic benefits of major military equipment projects are not always as high as those claimed in the early stages. Furthermore, while considerable efforts have been made to prevent such an occurrence, the costs of the JSF project could escalate as they have in most military equipment projects in the past. Even if the costs remain under control, the U.S. military could still opt to reduce the number of JSF aircraft or delay delivery in order to free funds for other equipment projects. Indeed, in the spring of 2002, news reports suggested that the U.S. Marine Corps and foreign partners were concerned because the U.S. Navy had examined the possibility of buying fewer JSF aircraft. If fewer aircraft than originally planned are produced, the costs per unit could increase.

Nevertheless, even if the United States reduces the number of aircraft it plans to acquire, the JSF project will still feature significant expenditures and potential economic benefits. For example, through their involvement with the project, Canadian and other foreign companies will have access to state-of-the-art electronic technology and advanced manufacturing processes that can help them compete for other contracts. In addition, the transfers of technology and other potential benefits for Canadian companies could increase if Canada were to decide at some later date to participate as a Level 2 or higher partner. If Canada were to purchase the JSF, the contract would no doubt provide for a higher level of regional industrial benefits than if Canadian participation remained at Level 3.

Whether or not Canada will buy the JSF aircraft to replace its CF-18s is difficult to predict, because such a decision could be delayed until just a few years before the current fleet of fighters reach the end of their service life around 2017. Given the long period of time in between, little is certain about the international context and the national situation that will prevail if and when Canada makes such a decision. It is not absolutely certain that Canada will replace its CF-18s with piloted aircraft or, indeed, at all. Changes in Canadian defence priorities, insufficient defence spending to cover the costs of replacement aircraft, or the development of new technologies could lead Canada to abandon fighter aircraft. Canada could opt to buy some uninhabited combat air vehicles (UCAVs) with fighter-bomber capabilities to replace its CF-18s. Some successes during operations in Afghanistan in early 2002 have added impetus to the development of UCAVs.

However, while UCAVs have advantages such as lower costs and complexity, they also have some disadvantages compared to piloted fighter aircraft; and the technology required to operate them efficiently in combat operations still requires considerable development. In other words, when the first JSF aircraft become operational in U.S. and other NATO armed forces during the next decade, UCAV technology will not necessarily have reached the stage where piloted fighter aircraft can be totally replaced. Furthermore, the need for piloted fighter-bombers will not necessarily be significantly reduced by the availability of other weapons systems such as cruise missiles and the increased emphasis on Special Forces operations. Some observers questioned the need for new fighter-bombers given the limited role played by U.S. Air Force F-15s and F-16s in the early stages of combat operations in Afghanistan in 2001 because of the lack of airfields in neighbouring countries. However, fighter-bombers operating

from U.S. aircraft carriers were significant participants in the Afghanistan campaign, albeit with considerable reliance on air-to-air refuelling. Besides, future coalition operations might more closely resemble those in Kosovo in 1999, where both land-based and carrier-based fighter-bombers played a key role.

In any case, if, in the next decade and beyond, Canada's defence priorities still include the ability to contribute effective fighter-bombers to coalition operations anywhere in the world, it will likely need piloted fighter aircraft as capable as those of its allies. Furthermore, if Canada still requires the capacity, now provided by the CF-18s, to deploy fighter aircraft in its airspace to intercept and identify intruders in order to assert Canadian sovereignty, it will have to maintain a fleet of piloted fighter aircraft. Whether or not Canada can still afford to have a fleet of modern aircraft like the JSF may depend on arrangements such as the leasing of aircraft or the pooling of training and maintenance resources among allies. Nevertheless, its defence priorities in the coming decades might necessitate the acquisition of aircraft like the JSF.

E. Consolidation of the Multinational Partnership

While a decision on whether or not to buy new fighter-bombers is still many years away for many countries, including Canada, the fact remains that the JSF is emerging as the aircraft of choice among NATO and other allied countries. After the United States and the United Kingdom, Canada was the first country to make a commitment to the SDD phase. Other countries soon followed suit. On 8 February 2002, just a day after Canada signed the MOU, the Government of the Netherlands announced its intention to participate in the SDD phase. Before the Netherlands could sign its MOU, Denmark signed one on 28 May 2002, joining Canada among the ranks of Level 3 partners. In the Netherlands, the government delayed the issue until after national elections. On 4 June, the newly elected parliament voted with a strong majority in favour of Dutch participation at Level 2 with a US$800 million commitment. Although no commitment was made to buy the JSF, Dutch officials suggested that their country could buy as many as 85.

Italy and Norway also confirmed their commitment to the SDD phase of the JSF project in early June. On 3 June, the Italian parliament voted in favour of Italy's participation at Level 2 with a contribution of some US$1.028 billion, while Norway's parliament approved Level 3 involvement at about US$126 million. Norway signed an MOU with the United States

on 20 June while Italy signed on 24 June, obtaining five positions in the JSF Program Office because of its significant commitment. Turkey became the eighth NATO member to participate in the SDD phase when it signed an MOU on 11 July 2002 and agreed to contribute US$175 million. Except for the United Kingdom, the European partners have yet to make a commitment to buy JSF aircraft and many do not expect to take a decision until 2008. Nevertheless, many of them, including Italy and the United Kingdom – which are already committed to buying some Eurofighter Typhoon air superiority aircraft – have suggested that the JSF appears to be the fighter-bomber best suited to meet their future requirements.

On 27 June 2002, Australia announced its decision to become a Level 3 partner in the SDD phase. The Australian government did not make a commitment to buy the JSF, deferring any final decision until 2006. Some opposition members criticized the partnership commitment on the grounds that other types of aircraft capable of replacing Australia's fleet of F-111 and F/A-18 fighters will not be seriously considered. The government countered that, as a next-generation fighter, the JSF will be better suited to meet the country's needs; moreover, partnership in its development will provide opportunities to Australian industries. While Australia is the first non-NATO country to become heavily involved in the JSF, other countries such as Israel and Singapore are expected to become partners below Level 3.

F. Latest Developments

Despite the commitments made by a number of countries to the SDD phase and the finalization of the F-35's external design, announced on 23 July 2002, some doubts about the future of the project persisted during the summer of 2002. In the United States, the F-35 project must compete with other expensive weapons systems for its share of the defence budget at a time when U.S. military forces and strategy are being transformed to take full advantage of advances in technology. Some analysts have suggested that since the U.S. Air Force is determined to protect the future of the F-22, renamed the F/A-22 to emphasize its ground attack capabilities, it might eventually opt to reduce the number of F-35s it intends to acquire in order to free funds for its other major project.

There was also some uncertainty concerning the future of the short-take-off-vertical-landing (STOVL) version of the F-35, given the fact that the United Kingdom had to make a decision in 2002 on whether to buy the STOVL version of the F-35 or the U.S. Navy

model. The United Kingdom had to make a choice at this time in order to finalize the design of the two large aircraft carriers it intends to construct, in keeping with the new defence policy set out in its *Strategic Defence Review* of 1998. On 30 September 2002, the United Kingdom reaffirmed its intention to buy 150 JSF aircraft and confirmed its choice of the STOVL version of the F-35. If the United Kingdom had opted for the U.S. Navy model, only the U.S. Marine Corps would have remained committed to the STOVL version, possibly raising new doubts about the future of this version.

Another source of uncertainty was the agreement reached by the U.S. Navy and the U.S. Marine Corps to better integrate their fighter aircraft units in order to reduce costs. The two services examined various options, including the purchase by the U.S. Navy of some STOVL F-35s and a reduction in the total number of F-35s they intend to acquire. The two U.S. services decided to choose the second option, since they believe that the new aircraft will be more capable and reliable than the current generation of fighters and that they will need fewer aircraft to carry out their missions given the closer integration of their fighter forces. As a result, the U.S. Navy now intends to acquire 430 F-35s instead of 480, while the Marine Corps will reduce its order from 609 to 350. The F-35 is not the only aircraft program affected by the integration: the U.S. Navy will also reduce its total acquisition of F/A-18Es and F Super Hornets, which recently began to enter service, from 648 to 462 aircraft.

Despite the reduction in the number of F-35s that the U.S. Navy and U.S. Marine Corps intend to acquire, Edward C. Aldridge, Jr., U.S. Under Secretary of Defense for Acquisition, Technology and Logistics, claimed during a press conference on 7 February 2003 that this decision should have no effect in the near term on the JSF project. He also stated that the eventual sales of F-35s to other countries should more than offset the impact of the reduction in numbers announced by the two U.S. services. Furthermore, he declared that the unit costs of the aircraft, despite the reduction in numbers, are still at the level the U.S. military hopes to maintain: US$37 million for the Air Force version, around US$47 million for the U.S. Navy variant, and about US$46 million for the STOVL version. In any case, the reduction in numbers has had little effect on the funding of the project. The proposed defence budget for Fiscal Year 2004 announced by the U.S. Administration in early February allocates US$4.4 billion to the JSF project for system development and demonstration.

PARLIAMENTARY ACTION

In Chapter 4 of its report *Facing Our Responsibilities: The State of Readiness of the Canadian Forces*, tabled in the House of Commons on 30 May 2002, the Standing Committee on National Defence and Veterans Affairs noted that Canada's decision to become a partner in the JSF project is opportune because of the potential benefits that participation in such a major high technology project represents for Canadian industry. The report adds that participation still leaves Canada with many options open if and when it decides to replace its CF-18s.

CHRONOLOGY

1993 –	The U.S. Navy, Air Force and Marine Corps established the Joint Advanced Strike Technology (JAST) program to explore the development of a common type of fighter-bomber.
16 November 1996 –	Boeing and Lockheed Martin were selected to participate in the evaluation process established to select the final design for the project, now called the Joint Strike Fighter (JSF).
1997 –	Canada gained the status of informed partner by participating in the Concept Demonstration Phase.
17 January 2001 –	The United Kingdom signed a memorandum of understanding (MOU) with the United States to participate in the System Development and Demonstration (SDD) phase while reaffirming its intention to acquire 150 aircraft.
26 October 2001 –	The U.S. Department of Defense selected the Lockheed Martin F-35 as the JSF aircraft.
7 February 2002 –	Canada signed an MOU with the United States to participate in the SDD phase as a Level 3 partner.
28 May 2002 –	Denmark signed an MOU to participate as a Level 3 partner.
17 June 2002 –	The Netherlands signed an MOU to participate as a Level 3 partner.
20 June 2002 –	Norway signed an MOU to participate as a Level 3 partner.
24 June 2002 –	Italy signed an MOU to participate as a Level 2 partner.

27 June 2002 – Australia announced its intention to become a Level 3 partner.

11 July 2002 – Turkey signed an MOU to become a Level 3 partner.

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