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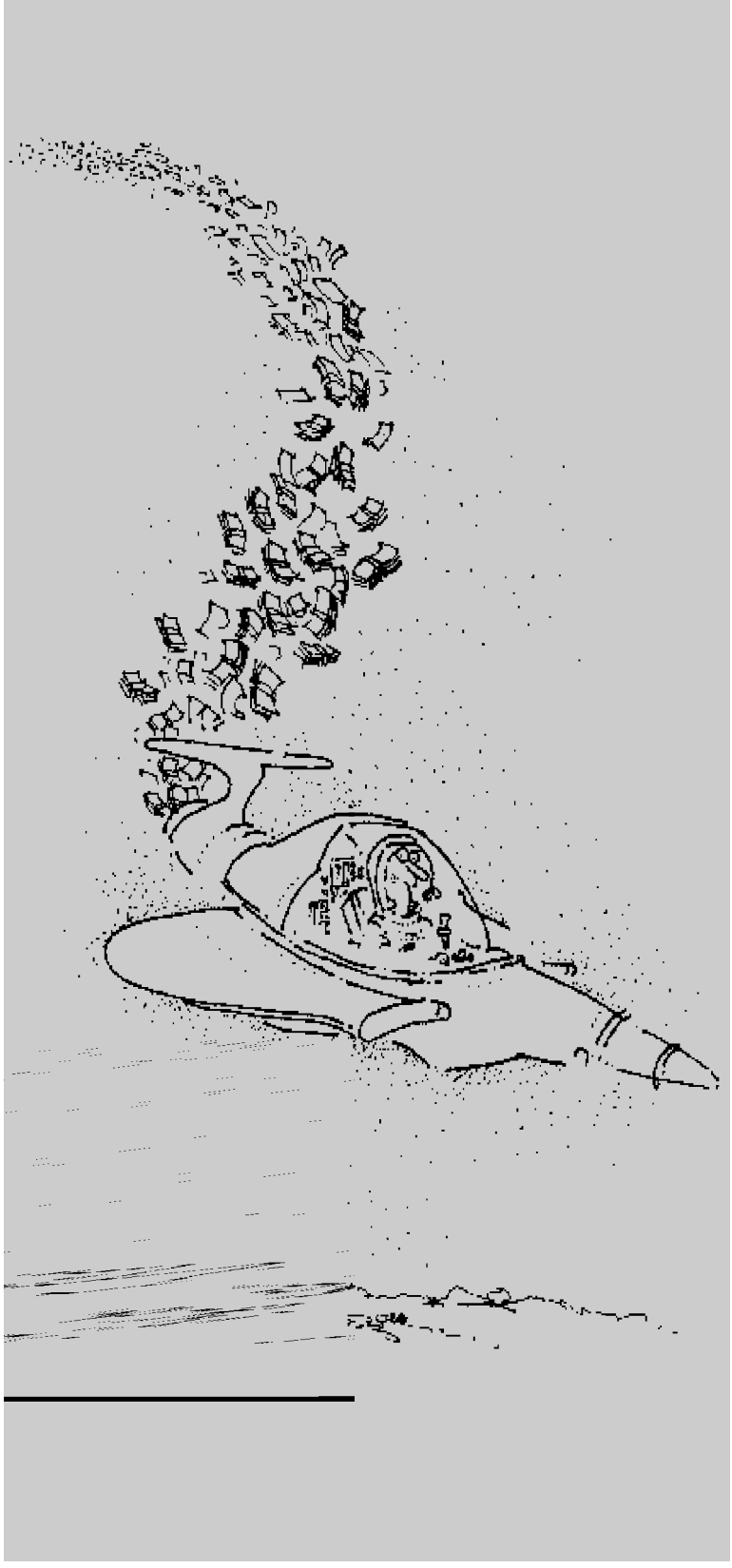

brief 5

Eurofighter 2000: Consequences and Alternatives

february 96

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brief 5

Eurofighter 2000: Consequences and Alternatives

by
Werner Voß and
Michael Brzoska

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Zusammen-fassung

German Summary

Die Entwicklung und Beschaffung von Jagdflugzeugen des Typs Eurofighter 2000 ist das größte laufende Rüstungsprojekt in Westeuropa. Die Gesamtkosten ohne Betrieb der Flugzeuge lassen sich auf etwa 100 Mrd. DM bis zum Jahre 2012 schätzen. Das Programm hat entsprechend große Auswirkungen auf die Luftfahrt- und Rüstungsindustrien der beteiligten Länder Großbritannien, Italien, Spanien und Deutschland. Um die Auswirkungen des Projektes, auch für den Fall einer möglichen Nichtbeschaffung, einschätzen zu können, hat das Bonner Konversionszentrum eine vergleichende wissenschaftliche Untersuchung in Auftrag gegeben. Sie liegt als Buch in deutscher Sprache vor[1] . Auch im Jahr der erwarteten Entscheidung, 1996, ist noch unklar, ob das Flugzeug in allen beteiligten Ländern beschafft wird und, wenn, in welchen Stückzahlen. Die Beurteilung der Möglichkeiten und Schwierigkeiten ziviler Nutzung vorhandener militärischer Kapazitäten hat daher praktische Relevanz.

Im vorliegenden „brief“ werden die Ergebnisse der vier Fallstudien zusammengetragen. Die unabhängigen Autoren aus den vier am Programm beteiligten Länder gelangen in ihrer Untersuchung der sicherheitspolitischen, wirtschaftlichen, technologischen und finanziellen Auswirkungen zu dem Ergebnis, daß ein starres Festhalten an der Mitte der 80er Jahre festgelegten Planung für Beschaffung und Produktion angesichts des grundlegenden sicherheitspolitischen Wandels in Europa nicht vertretbar ist.

Die Autoren der Studie sehen nach dem Ende des Kalten Krieges in Europa stark verminderten Bedarf für Jagdflugzeuge mit geringer Reichweite wie den Eurofighter. Die Zahl der Kampfflugzeuge in den Staaten des ehemaligen Warschauer Paktes vermindert sich zunehmend, weil seit 1992 kaum noch Beschaffungen getätigt wurden. Selbst unter der pessimistischen Annahme einer erneuten Konfrontation mit Russland ergibt sich bei Durchführung der in Westeuropa und Russland absehbaren Beschaffungen von Kampfflugzeugen im Jahre 2010 ein deutliches Übergewicht, noch ohne Berücksichtigung der in Europa stationierten US-amerikanischen Verbände.

In Spanien und Italien wird die Beschaffung des Eurofighter mit der Bedrohung aus dem „Süden“ begründet. Obwohl auch in den südlichen Mittelmeeranrainerstaaten die Zahl moderner Kampfflugzeuge abnimmt, hat die italienische Luftwaffe auf Grund der starken Überalterung der Jagdflugzeugflotte, die vor allem aus F-104S Starfightern aus den 60er Jahren besteht, erheblichen Nachholbedarf. Die britistische Luftwaffe sieht erheblichen Bedarf für den Eurofighter, der als Jäger und Jagdbomber ausgerüstet werden soll, vor allem für Kampfeinsätze außerhalb Europas. In Großbritannien wird die Beschaffung der Eurofighter von allen großen Parteien unterstützt. Das Projekt ist für die angeschlagene britische Luftfahrindustrie von überlebenswichtiger Bedeutung.
Die britische Regierung wird das Eurofighter-Programm notfalls in eigener Regie durchführen. Italien wird sich wegen des dringenden militärischen Bedarfs mit großer Wahrscheinlichkeit beteiligen. In Spanien, wo die Luftwaffe bereits über moderne US-amerikanische Kampfflugzeuge verfügt, ist die Entscheidung offener. Die spanische Entscheidung wird von der Haushaltslage und den Kosten des Flugzeuges abhängig sein.
In Deutschland und Spanien ist das Programm überwiegend zu einem industriepolitschen Projekt geworden, was es in Italien und Großbritannien auch ist. Angesichts der hohen Kosten und der Art der geförderten Technologie - weitgehend spezifisch militärische Luftfahrtechnologie, werden Zweifel an der Zukunftsträchtigkeit einer solchen staatlichen Industriepolitik angemeldet.

[1] Michael Brzoska und Werner Voss (Herausgeber). Auswirkungen und Alternativen des Eurofighter 2000. Eine Vier-Länder-Studie für das Internationale Konversionszentrum Bonn. Nomos-Verlag, Baden-Baden, 1996. 300 pp. DM 49,—.

Ein Verzicht auf die Beschaffung ohne Kompensationen für die beteiligten Firmen würde in den beteiligten Ländern zu erheblichen Verlusten an Arbeitsplätzen führen. Die Möglichkeiten der Firmen, den Auftragsausfall durch Ausbau ziviler Produktionszweige aufzufangen, sind begrenzt. Durch direkte Konversion wird angesichts der angespannten Lage in der zivilen Luftfahrtindustrie, der relativ hochwertigen und damit teuren Fertigungsstrukturen bei den betroffenen Firmen und der mangelnden langfristigen Vorbereitungen durch das jeweilige Management nur ein geringer Teil der Arbeitsplätze gerettet werden können. Sehr viel mehr Arbeitsplätze ließen sich erhalten, wenn den betroffenen Firmen Kompensationsaufträge für den Ausfall der Eurofighter-Produktion gegeben würden.

Um die Folgen eines möglichen Verzichts auf die Beschaffung in einem oder mehrerer der beteiligten Länder beurteilen zu können, werden verschiedene Alternativszenarien durchdacht. Als eine mögliche Alternative wird vorgeschlagen, statt der jetzt vorgesehenen Aufteilung der Produktion auf die vier beteiligten Länder die Fertigung in Großbritannien zu konzentrieren. Dafür könnten den Industrien der anderen Länder Kompensationsaufträge gegeben werden. Damit könnten die Beschaffungskosten gesenkt und zugleich erfolgversprechende zivile Technologielinien gestärkt werden.

Die gegenwärtige Restrukturierung der welweiten Luftfahrtindustrie nährt weitere Zweifel am industriepolitischen Sinn der Beschaffung. Eine Konzentration der europäischen Kapazitäten ist überfällig. Die Produktion des Eurofighter in Deutschland behindert die unvermeidlichen Konzentrationsprozesse auf europäischer Ebene ohne der deutschen Luftrüstungsindustrie eine langfristige Perspektive bieten zu können.

Preface

by Michael Brzoska

If procured as planned, the Eurofighter 2000 will be the largest arms industrial project in Western Europe. The program has major importance for the aerospace and arms industries in all four of the participating countries: the United Kingdom, Germany, Italy and Spain.

Originally planned in the framework of the Cold War, the program has come under severe criticism in the changed environment of the early 1990s. Both the definition as short-range air superiority fighter as well as its cost have fed opposition—predominantly in Germany, but also in Spain and to a lesser extent in Italy and the United Kingdom.

More and more, economic arguments, especially those related to the employment of several thousands of highly skilled aerospace workers, have become the predominant counter-argument to such opposition. It is claimed by industry that the cancellation of Eurofighter procurement would result in the permanent loss of more than 60,000 jobs in all of the participating countries. The aircraft industries in these countries would be damaged, it is claimed, by the immediate loss of an order probably worth more than US $60 billion (for about 600 aircraft). In addition, long-range competitiveness, in both military and civilian aerospace, markets might suffer. If Germany cancels procurement, lob losses of 20,000 or more have been predicted. On the other hand, procuring a fighter aircraft mainly because of its economic impact does not seem to be a justifiable decision in times of general fiscal stringency. Military markets are shrinking; civilian production provides much better long-term prospects. If governments want to help the aerospace industry, support of civilian activities seems wiser. Other alternatives, such as solar energy, may even provide better long-term prospects. Unfortunately, it is not obvious that those currently employed in military aircraft programs would benefit from civilian alternatives.

Because of these conversion-related aspects, the Bonn International Center for Conversion asked independent academic experts from the four participating countries to contribute to a comprehensive study of the program. Authors were asked to address the security, fiscal, industrial, economic, technological and conversion issues arising both from the program as planned and from a possible cancellation. Susan Willett (King's College, University of London), Jörg Huffschmid (Universität Bremen), Guilio Perani (Archivio Disarmo, Rome) and Arcadi Oliveres (University of Barcelona) contributed detailed country case studies.

The case studies and a summary by Werner Voß of ISA Consult were discussed in a day-long seminar in Bonn on 27 April 1995 with government, industry and union representatives, as well as journalists and academics. The case studies were than revised and are published in a German-language book that is now available from BICC.[1]

This brief is based on the German-language summary of that book. It specifically addresses, in a comparative manner, the effects of the program and possible alternatives in the participating countries. The study benefited from the contributions and the support of a large number of persons. The Hans-Böckler-Stiftung generously helped to finance the seminar. The summary was translated by Andrew Dennison. Special thanks are due to the authors who provided detailed contributions, often containing data not available elsewhere. Of course, as outside experts, they did not have access to all the information and material that is classified but would have been useful for this comprehensive study of the program. Still, they succeeded in providing a useful contribution to a debate that is more than necessary given the scale of the program.

[1] Michael Brzoska and Werner Voß, eds. *Auswirkungen und Alternativen des Eurofighter 2000. Eine Vier-Länder-Studie für das Internationale Konversionszentrum Bonn*. Baden-Baden: Nomos-Verlag, 1996. 300 pp. DM 49,—.

Eurofighter 2000: Consequences and Alternatives

by Werner Voß

This brief will bring together the results of four country case studies of the Eurofighter 2000 program. Like these studies, this summary will first examine the security issues and then those of fiscal, employment and technology policy. Sections on the short- and long-term employment policy alternatives will follow.

This brief's second section will undertake a comparative description of the prospects, problems and policy alternatives that would follow from the various possible political decisions that governments might make regarding Eurofighter production. These alternatives will be presented by depicting various scenarios, which is an effective way of identifying the significant aspects of an issue.

In the period leading up to the production decision, which is expected in 1996, numerous alternatives appear possible. They range from completing the program as a four-country project by jointly procuring the aircraft, to one or more of the partners leaving the project, to a decision on the part of all the partners to entirely refrain from producing a new fighter aircraft.

The status quo scenario will provide the context for describing the expectations and difficulties associated with the joint procurement of the Eurofighter. The assumption that increased exports are necessary for the success of the program—an argument frequently made by industry—is of particular importance for this analysis.

An alternative scenario will look at the possibilities and consequences of complete or partial abandonment of the Eurofighter's procurement program. In this context, various drop-out options will be discussed: purchasing another aircraft, perhaps under licensed production, or concentrating production of the Eurofighter in Great Britain.

The chapter begins with a short recapitulation of the project's history. Such a description clarifies the similarities as well as the many differences between the partner countries involved, thereby providing a foundation for understanding the complexity of the program.

The Origins of the Eurofighter 2000

As early as the 1970s, the expectation that research and development costs of a new fighter would be very high led various air forces and governments to examine whether an aircraft could be jointly developed and built. It was to replace the 1960s vintage F-4F Phantom (Germany, Great Britain, Italy), F-3 Tornado (Great Britain), and F-104 Starfighter (Italy). These aircraft were slated for retirement in the 1990s.

The European Fighter Aircraft (EFA), as it was then known, had a number of antecedent models in France and Great Britain: France pursued the demonstration program Avion de Combat Experimentale (ACX), which was later redesignated as the "Rafale." British firms (British Aerospace, GEC Avionics, Rolls-Royce, Dowty, Lucas, Ferranti and Smiths Industries) began to develop a new fighter aircraft in the context of the Experimental Aircraft Programme (EAP). The British defense ministry only began to support this program in 1982.

In Germany, aviation companies were also defining the requirements for a new fighter aircraft. It was to replace, by the mid-1990s, the F-4 Phantom used by the German air force. These activities, begun in the fall of 1976, did not lead to the results German industry had hoped for. Substantial difficulties in financing the MRCA Tornado led then-defense minister, Hans Apel, to declare a spending (and reassessment) pause for the new aircraft. The change to a conservative-liberal government in 1982 rekindled the discussion of a follow-on model for the F-4 Phantom. At the same time, impetus grew for multilateral governmental talks.

In the summer of 1983, the defense ministries of Great Britain, France, Germany and Italy began serious negotiations regarding a European Fighter Aircraft. Already in 1983, the air force staffs were able to agree on a joint tactical framework (Outline European Staff Target, OEST). According to their agreement, the primary role of the new fighter aircraft would be air defense; additionally, it was to have a ground-attack capability. The fighter was to have a one-man crew, a range of 550 km, multiple target acquisition radar and the ability to take off and land on short runways.

The governments were not able to reach agreement on a clearly specified empty weight in the tactical framework agreement. Whereas the German air force preferred a weight of 8.5 tons, the French side wanted 9 tons. The British favored 11 tons. As a comprise, they agreed on upper and lower limits.

Despite these differences, negotiations continued. In October 1984, the parties agreed on a more concrete description of the project within the context of a "European Staff Target." Shortly thereafter, the aviation industry was commissioned to draw up two feasibility studies. The French aircraft manufacturer Dassault obtained a contract to design a fighter with an empty weight of 9.5 tons minus 250 kg. The major aircraft manufacturers of the four other partner states (British Aerospace, MBB, Aeritalia and CASA) designed an aircraft of 9.5 tons plus 250 kg. By February 1985, the companies had presented the two designs. Yet neither fully met the requirements of the European Staff Target; further refinements in the respective concepts followed.

Behind these diverging ideas about weights lay irreconcilable differences over the planned aircraft's role. Despite the compromise reached during the preceding negotiations, the French saw their security better served by an aircraft designed primarily for a ground-attack role. The low empty weight would also help reduce costs, thereby improving the prospects for export. This was part of a strategy aimed at a stable and full utilization of French aircraft construction capacity—capacity that was highly dependent on exports.

Export chances also played an important role in the British debate over a new fighter aircraft. Nevertheless, the distance to the assumed Central European battlefield and the prospect of deployment overseas left the British air force arguing that a lighter aircraft would not meet their requirements. The heavier aircraft they wanted also had consequences for the design of the aircraft's engines.

As with the airframe manufacturers, the British engine manufacturer Rolls-Royce and its French "counterpart" Snecma had already done considerable design work for the respective aircraft configurations. The interests of the various industries, which were basically structured along national lines, clashed on this issue.

These differences over the design were rooted in the desire of the industries to maintain their influence and to make the most of the money they had already committed. Which industry was to lead the common project was thus an important question. Despite a variety of compromise proposals, the parties could not find a common solution during the mid-1980s. The attempt to develop and produce a new fighter in the context of a five-country arrangement was abandoned. France went its own way with the development of the "Rafale." The Spanish government refrained from doing the same only after the other three Eurofighter states guaranteed it both an economic stake commensurate with its financial contribution and protection from an uncontrolled cost explosion.

The governments of Great Britain, Germany, Italy and Spain signed the first Memorandum of Understanding (MOU No. 1) on 21 October 1986. Therein they declared their intention, in principle, to jointly develop and procure a new fighter aircraft. The aircraft was to be capable of combat both close-up and beyond-visual range. It was to be armed with AMRAAM and ASRAAM guided missiles (though the ASRAAM option has since been dropped). Furthermore, the EFA was to acquire all-weather and day-and-night capability. The new fighter aircraft's primary function was to be air defense, but it was also to be suitable for ground attack.

The international program office NATO European Fighter Aircraft Management Agency (NEFMA) was to supervise the project, and began operations in February 1987. The establishment of corresponding industrial program structures had already occurred. In Munich, in June 1986, the Eurofighter Jagdflugzeug GmbH was established as the prime contractor for the new fighter. Eurojet Engine GmbH was set up a short time later to organize engine development. These entities allowed the various national industry groups participating in the European Fighter Aircraft to join interests at the international level.

The program office NEFMA has been responsible for awarding contracts since the beginning of the development phase. MoU No. 1 also stipulates that German and British companies and institutes will each receive 33 percent of the development contracts, the Italians 21 percent, and the Spanish 13 percent.

The second framework agreement (MoU No. 2), signed on 18 January 1987, settled a number of additional aspects of the ongoing development phase. In September of the same year, the partner countries signed the "European Staff Requirement for (full) Development" (ESRD). This specified more concretely the operational requirements for the new aircraft and thus the development process in general.

The governments made a non-binding commitment to procure 760 aircraft. Germany and Britain both intended to purchase 250 units or 33 percent of the total production. Italy agreed to purchase 160 aircraft (21 percent), while Spain planned to buy 100 (13 percent).

National parliaments took up the question of the new aircraft during 1988. Additionally, the partner defense ministries signed MoU No. 3 in November 1988, which was to be retrospectively valid from January 1988.

The apportionment of project tasks was also agreed on: British Aerospace would take on primary responsibility for developing the front fuselage and half of the right-hand wing. MBB would develop the central fuselage and the vertical tail unit. Aeritalia would design the left wing as well as half of the rear fuselage. The Spanish aircraft manufacturer CASA would do development work on the other half of the right wing as well as the rear fuselage. Rolls Royce (UK), MTU (now a part of Daimler Benz Aerospace AG, Germany), Fiat Avio (Italy) and SENER (Spain) were the primary contractors for the development of the jet engine EJ2000.

Development work continued and the EFA project grew less contentious. Only occasional controversies over rising prices attracted any public notice. These controversies did not, however, call into question the validity of the program in principle.

This did not occur until the collapse of the Warsaw Pact. The FDP, Germany's Liberal party, decided to withdraw its support for the project at its traditional Epiphany conference in January 1990. Intense controversy and broad-based investigations soon surrounded the "Jäger 90" project, as it is known in Germany. How the aircraft's costs could be reduced was at the center of the debate.

In the period that followed, the program's increasing difficulties in the development of certain components—particularly the avionics—became well-known. Indeed, technical problems made it impossible to adhere to the timetable agreed upon in 1988. The first flight of a prototype, initially planned for 1991, was postponed numerous times; the first flight finally took place in April 1994.

Moreover, the Spanish government announced in February 1992 that it would buy only 87 instead of the planned 100 aircraft. The German government also signaled that it would prefer to purchase 140 instead of the previously planned 250 aircraft. These events all confronted the project with increasing tension between the four participating countries.

In the context of continued domestic debate, the German defense minister, Volker Rühe, provoked a serious crisis for the consortium in June 1992. Rühe proposed abandoning the planned project and building a new, significantly cheaper aircraft—dubbed "EFA light."

The British government, in particular, reacted very negatively to this proposal. The uncertainty of developments in Eastern Europe justified for the British government that a new fighter with the commonly defined characteristics was needed. At the same time, the British government argued that pursuing a new aircraft design would devalue the research and development costs that had already been incurred, while adding additional costs because of delay involved in redesigning the aircraft.

In an effort to maintain Germany's participation in the cooperative venture, the Eurofighter consortium was commissioned to undertake a study on how the expected costs of the original version could be reduced by 2 billion DM. Savings would be aimed, in particular, at lowering the calculated unit-cost by 30 percent. This would bring the price per aircraft under what the German government viewed as the "magic" 100 million DM threshold.

On the basis of the original configuration, including two jet engines, industry outlined potential savings. Changes in the aircraft design led the authors to speak of a "New European Fighter Aircraft" (NEFA). NEFA, it was said, could be built for a unit price of 100 million DM. The savings were to come from reduced equipment standards, more rationalized logistic structures and more concentrated investments. Governments received the study in October 1992.

A few days later, the British government underlined its intention to continue the original program—alone if need be. Britain also suggested a trilateral continuation of the project to the Italian and Spanish governments. This ruled out a joint termination of the development project. Realizing that it could only leave the project at great cost, Germany decided to stay involved at least through the end of the development phase.

In December 1993, the four governments agreed to continue the project on the basis of changes in the overall configuration of the aircraft. In order to symbolize a new beginning, they renamed the project "Eurofighter 2000." The precise nature of this agreement is still not entirely clear to the general public. A Memorandum of Understanding dividing the extra costs resulting from redevelopment (MoU No. 4) was only signed in April 1995.

Commitment to the multi-functional design of the aircraft continued: the Eurofighter 2000 was to have both air-to-air and air-to-ground roles. The German air force viewed the later function as ancillary. In contrast, the British government underlined its intention to enhance the aircraft's ground attack role.

The Eurofighter 2000 would stay with EFA's airframe and the EFA's twin jet engines. Those countries that would continue with the production phase would be able to fit the aircraft as they desired. The decision on procuring the aircraft would be made in 1995.

Despite the joint continuation of the project, one problem remained acute: the financial difficulties incurred by the price dynamic of the planned aircraft could not be solved by the restructuring measures. Rumors of significant cost increases and risks continue.

This inability to control costs could induce substantial changes in the procurement plans of the various governments. Only Great Britain appears committed to its original intention to purchase 250 (or even more) aircraft. Spain has reduced its purchase plans from 100 to 72. Italy seems to only want 130 planes instead of the original 165. The situation in Germany is still unclear. Discussion about the effects of the reduced procurement plans were still ongoing at the time of writing.

Every reduction in the number of aircraft built inevitably increases the unit cost. This does not make the decision to participate in the procurement and production of the Eurofighter any easier. No definite cost calculations were available at the end of 1995.

In this respect, the EFA crisis of 1992 and the programs continuation into the present also shows the great strength of military, technological and industrial interests. By the same token, it demonstrates how difficult it is to change the trajectory of such a multilateral program once it has begun.

A Comparative Survey of the Country Studies

The significance of the EUROFIGHTER project

A comparative assessment of the specific national priorities and developments requires an adequate and overarching frame of reference. A number of important elements have already been mentioned such as security policy and alliance politics. Also, the program must be seen in its economic context including criticism regarding its negative impact on national and of the Eurofighter's implications for maintaining capacity in the defense and aviation industry. The program also raises the issue of short- and long-term industrial policy. The major results of the four country studies in regard to these questions are depicted in Table 1. They are explained in greater detail below.

Table 1: Effects of the Eurofighter program

	Spain	Italy	Germany	Britain
Significance for air force planning	priority	priority	medium	priority
Are military requirements met?	totally	mostly	to a large extent	to a large extent
Political acceptance of the project	not discussed	high	controversial	high
Assessment of costs of Eurofighter	very high	very high	worryingly high	very high
Industrial dependence :				
Total economy	low	low	low	high
Aerospace industry	high	high	influential	very high
Defense industry	high	high	substantial	high
Technology policy :				
Total economy	important	secondary	secondary	important
Aerospace industry	important	important	less important	important
Defense industry	important	important	important	important
Short-term conversion possibilities on company level	little	little	little	very little

Security aspects

All four countries continue to adhere to the formal rationale behind the new aircraft: it is to replace the aging fighters of the respective national air forces. The Italian air force continues to rely on the F-104 Starfighter. Germany's and Spain's air defense is primarily dependent on the F-4F Phantom—an aircraft type that was already used during the Vietnam war. The British air force also relies on relatively old weapons systems, including Jaguars and the Tornado-ADV (see Table 2).

Since the dissolution of the Warsaw Pact and the Soviet Union, the mere fact that a weapon system is outdated no longer justifies a new weapons program. Convincing military and political rationales are also necessary. The once dominant threat perception of a Soviet attack is being gradually replaced by other somewhat ambiguous threat perception to justify continuation of the project.

As in the past, one line of argument is to determine and compare the current and planned levels of fighter aircraft. This procedure is burdened by certain "uncertainties"; subjective influences can play a role and qualitative aspects are not accounted for. Nevertheless, it helps to identify certain trends.

On the basis of figures from the Institute for Defense and Disarmament Studies, Table 3 shows fighter aircraft levels in Europe. The five West European states, Great Britain, Germany, France, Italy and Sweden had 2,167 combat aircraft in 1995. Despite the planned modernizations, e.g., the Rafale and the Eurofighter, this figure will decrease to 1,791, a reduction of 17.4 percent, by the year 2010. Russia had an inventory of 3,514 combat

Table 2: Aircraft to be replaced by the EF 2000

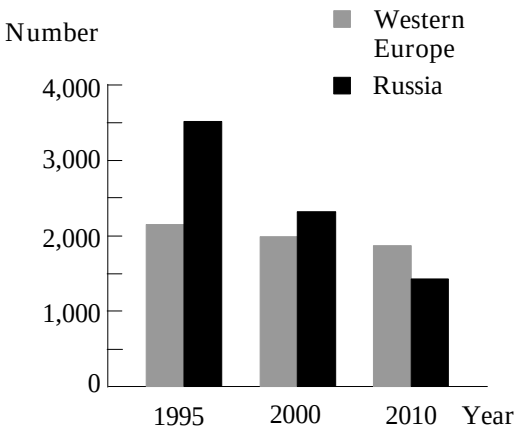
Country	*Fighters*	*Fighter bombers*
United Kingdom	134 Panavia Tornado F-3 ADV already retired: MDD F-4 Phantoms	54 Sepecat Jaguar 171 Panavia Tornado GR-1
Germany	150 MDD F-4 Phantoms, 20 Mikoyan MiG-29	193 Panavia Tornado FGA
Spain	33 Dassault Mirage F-1 CE/BE already retired: Dassault Mirage IIIs	22 Northrop F-5B 17 Dassault Mirage F-1EE
Italy	99 Lockheed F-104ASA	70 Panavia Tornado FGA 15 Fiat G-91Y 66 Aeritalia AMX

Source: IISS, 1995

Table and graph 3: Current and planned levels of total number of fighter aircraft in the years 1995—2010

	1995	*2000*	*2010*
Western Europe			
Great Britain	419	419	464
Germany	444	360	301
France	612	532	438
Italy	348	294	300
Sweden	344	296	288
Total :	2,167	1,901	1,791
Russia	3,514	2,302	1,310

Source: *Forsberg, 1994*



Source: *see Table 3*

aircraft in 1995 and is planning to reduce this by almost two-thirds to 1,310 by 2010. On the basis of current planing, Russia's quantitative superiority in 1995 will have turned into a significant West European superiority by 2010. The comparison does not include Ukraine. It is a major country with its own fighters that could also pose a threat to the West. But the summary provided by the Institute for Defense and Disarmament Studies also excludes Spain. More importantly, it excludes the United States, which will have more than twice as many combat aircraft as Russia in the year 2010. Additionally it makes no reference to NATO's possible expansion to include Central East European states.

In sum, the available data indicate that the security rationale for a new aircraft has become weak. At least in the mid-term, the available capabilities of the western states appear more than sufficient in view of a "threat" that has declined and continues to decline. In view of the difficult economic situation in Ukraine and Russia, it seems a mistake that the governments involved are not negotiating further disarmament. The analysis is only marginally different with respect to the „Southern periphery" of Europe.

The analysis in the country case studies show that the respective military establishments have significantly shifted their argumentation, particularly in terms of the Eurofighter's future place in national security policy. The changes in Central and Eastern Europe explain much of this shift.

Improved relations with former "enemy" states have generated growing doubt —particularly in unified Germany —about the need to replace the Phantom with a technologically demanding and thus extremely expensive EFA (Jäger 90) or EUROFIGHTER 2000. In view of the total decline in threat, the German defense ministry expressed its interest in "shedding excess fat" from the planned version of the aircraft. Still, the official line is currently that a complete renunciation of such an aircraft is not possible from the national security perspective because of the ongoing reorientation of Germany's armed forces. "Multi-directional" threats to German territory and the necessity of protecting German troops in out-of-area operations now provide the basis for justifying the procurement of the aircraft. However, in the view of the author of the case study on Germany, Jörg Huffschmid (1996), the military specifications of the Eurofighter do not correspond to the requirements for the intended new missions.

In Great Britain, the military establishment did not see such a "justification gap" in the early 1990s. While they recognized that the threat of a massive Warsaw Pact attack had disappeared, they pointed to substantial and growing instability within Europe. In the view of the British defense ministry, this was especially the case on the territory of the former Soviet Union. Problematic developments were also occurring outside Europe; the Middle East, in particular, remained unpredictable. Because the states of the former Warsaw Pact were armed with third generation military aircraft —among them the MiG-29 Fulcrums and the SU-27 Flankers —Great Britain would also have to modernize its air defenses. For these reasons, the Royal Air Force placed great importance on the acquisition of an aircraft adhering to the defined requirements of the EFA. This led Malcom Rifkind, then state secretary in the defense ministry and now foreign minister, to announce in 1993 that Britain would complete the program, if necessary on its own.

In contrast to Germany and Britain, Italy and Spain define their security requirements more in terms of Mediterranean problems; they tend to see threats stemming from the countries of the south (Maghreb countries). A number of states in Africa and the Middle East possess third-generation combat aircraft (such as the MiG-29 and the SU-27).

As these aircraft are technologically superior to the F-104 Starfighters, the Italian air force places great importance on acquiring a new fighter. The performance characteristics of the Eurofighter appear to fit the military requirements of the Italian air force better than is the case with Germany. Nevertheless, the author of the Italian country case study, Guilio Perani (1996), also calls into question whether the Eurofighter is, from a technical perspective, the best of all possible solutions. There has been no public debate of any significance in Italy over this matter. Nor has Spain seen public debate on the security implications of the Eurofighter.

Financial and economic aspects

From the very beginning, the Eurofighter has provoked discussion not only of its financial implications but also of its impact on economic, industrial and technology policy.

With public indebtedness sometimes rising to exorbitant levels, West European governments have given increasing attention to keeping the costs of new weapons systems under control. Sluggish economic growth in recent years has reinforced the need to curb budgetary excess. Nevertheless, different groups within the affected societies have viewed the Eurofighter's cost development quite differently. Other factors, such as preserving jobs and pushing technological development, also affect their assessment of this defense program. The authors of the country studies have concluded, on the basis of the material available to them, that the aircraft's unit-price (at currently planned production levels) will be at

the upper, not the lower, level of official price estimates.

The Italian budget accounting office assumes that the project will exceed the planned development costs of around 800 to 900 billion Lira. Nor will it be possible to stay within the defense ministry's figure of 15,525 billion Lira (1994 prices) for the entire program, as its completion has already been delayed. In Germany, the federal accounting budget office estimates that the procurement price per aircraft will not be 90 million DM—as suggested by the German defense ministry in 1992—but closer to 150 million DM. Huffschmid (1996) calculates that including the aircraft's armament cost and assuming the purchase of only 100 instead of 140 fighters pushes the unit-price to between 175 and 195 million DM. Great Britain also has experienced cost overruns during the development phase. Based on a system price of more than US $ 100 million , total production costs of about 600 aircraft would amount to US $ 60 billion.

While the British and Italian governments view the cost development of the Eurofighter with concern, there has been less debate about either past or future cost overruns. The great importance of the aircraft to air force planning in the two countries explains this. So does the expected economic and technological benefit, both to national aircraft industries and individual firms.

The German federal government, especially the ministry of defense, faces a different situation. It must also contend with a national budget pushed deep into debt by the costs of unification. Nor are further tax increases likely to ease the financial pressure facing the Eurofighter. Modernizing the infrastructure and economies of the new Länder and covering higher social outlays has already made for a very wary taxpayer. Germany's recession in 1992 and 1993 only exacerbated this. The Eurofighter is thus clearly in competition with other public expenditures. Significant cost increases would further reduce the already limited public willingness to finance a new combat aircraft. A similar assessment can be made for Spain: procurement becomes less likely with a price higher than initially planned.

Industrial dependence

Germany's relatively low interest in the Eurofighter also stems from the program's marginal impact on industry and employment. To an extent, this is also true of Italy and Spain. On the other hand, Great Britain's generally weak industrial base makes the Eurofighter an issue of greater salience.

> The arms industries of the partner countries view the program with great interest. Assuming that the aircraft would go into production, its share of employment in the German arms industry would be substantial (about 10 percent of the 120,000 workers directly and indirectly employed in the arms industry). In Italy, Spain and Great Britain, it would be even higher. The percentage would go up if the project's cost were to rise while public spending was being cut, as this would likely result in the termination of other weapons programs.

This kind of competition is already well known in Germany. It contributed to the delay in starting development work on this aircraft in the early 1980s. Officially, all the partner countries maintain that the project is important for retaining a minimal capability to participate in the construction of combat aircraft in the future. Huffschmid questions this argument, claiming that system capability already exists and can be maintained in the civilian aviation industry.

Nevertheless, the aviation industry is already suffering from excess capacity and the rising number of competitors makes it a "perilous place to do business" (Willet, 1996). Globally, excess capacity is at 30 percent; in some branches, it reaches 50 percent. GATT guidelines have also made direct support for "national champions" more difficult. In this context, weapons projects appear capable of circumventing such restrictions and temporarily stabilizing employment.

The authors of the country studies see the Eurofighter having the following effects on employment:

- In Great Britain, the development of the aircraft currently employs between 3,000 and 4,000 workers. Observers expect that direct and indirect employment will rise to 20,000 at the high point of production. It will be concentrated in the regions of Lancashire, Warton and Bristol.

- In Germany, around 2,500 people were working on the aircraft's development in 1995. If 140 aircraft are purchased at a unit-price of 100 million DM, then the annual average employment created over a 10-year period would be 10,000. If the widely expected cost increases occur, then employment could rise to between 13,500 and 15,000. The jobs would be concentrated in Bavaria and Baden-Württemberg.

- In Italy, there are currently around 2,000 people employed on the project. The Italian Defense Ministry estimates that the production phase will create 15,000 jobs. This would make up somewhat less than half the number of people currently employed in the Italian aircraft industry. The author of the italian case study, Guilio Perani, thus sees this estimate as exaggerated. He assumes an average of 7,000 jobs for a

procurement phase of 12 years and 5,600 for a period of 15 years. The regions currently involved in the development of the aircraft, Piedmont, Lombardy, Latium and Campagnia, will also get most of the employment from the aircraft's production.

- In Spain, estimates put direct employment on the aircraft at around 5,000 during production, with less than 2,000 employed during development.

While these figures are impressive, it must be remembered that they are the result of public expenditure of several tens of billions of US dollars. The mid- and long-term effect of such employment subsidies are more than doubtful as they tie up resources that could be better used elsewhere (see, for example, Krugman, 1994, p. 234 ff).

The broad distribution of the production of the Eurofighter will also counteract the necessary restructuring of the European aerospace industry. It will obstruct the creation of European capacities (even if only in the four participating countries).

The Eurofighter's influence on technology policy

Though it is a military program, the Eurofighter will influence the technology policy of the participating countries—in proportion to its industrial significance.

In Germany, Huffschmid (1996) sees the impact on technology policy as remaining limited; the limited technological impact of weapons projects is a consequence of the strong civilian orientation of German research and the German economy. Moreover, the really significant technological "breakthroughs" are coming from the civilian sectors of the economy. These civilian breakthroughs have then been integrated into new weapon systems in recent years; the "spin-off" argument (if there ever was much validity to it) has been turned around. Today it is more appropriate to speak of "spin on," namely using the results of civilian research and development for military projects. Naturally, this does not rule out isolated technological breakthroughs in the military sector. The Eurofighter will not reverse this long-term trend; the aircraft will primarily contain present-day technology.

Italy is also not pursuing a national technology strategy in regard to the Eurofighter. This situation is a result of the Italian defense ministry's lack of a coherent research and development policy. Research is carried out by the companies involved. They are, however, oriented towards mid-term commercial interests. These companies are not part of a strategy for achieving broader social objectives.

In contrast, the British government uses military projects in general and the Eurofighter in particular to achieve the primary objectives of its technology policy. Maintaining and expanding military-related capabilities and capacities is a high political priority in Great Britain. The British government is against officially promoting "critical" technology lists, but the discussion of future research priorities in the 1994 *Statement on the Defence Estimates* and *Forward Look* (see Willet, 1996) show that the defense ministry has in fact defined such crucial technologies. Spain is also trying to use military projects as a doorway into other areas of high technology.

The wide variety of views on the role of the Eurofighter in the various national technology programs should not obscure the similarity of perspectives in the defense ministries and arms industries. These interest groups see the aircraft project playing an important role in advancing military-technological developments. The major concern is US competition in military aircraft production. In view of the increasing importance of civilian technology, it is questionable whether a narrow concentration on arms production capabilities is appropriate.

Conversion possibilities at the company level

Despite considerable efforts in recent years, Western European countries have not been able to shift to a path of sustainable development process. Supporting a new path to growth and prosperity, Huffschmid argues for combining a cancellation of the Eurofighter with moves towards a solar power economy and the development of more ecological jet engines. A decision to build the Eurofighter would lead to significant investments in a technological direction incapable of adequately addressing the long-term challenges to Europe's industrial societies. As laudable and appropriate as this proposal is, it is an open question whether such an economic and ecological reorientation can keep jobs secure in companies highly dependent on arms production. The other authors are skeptical on this matter.

The short-term possibilities for conversion or diversification of the concerned companies in Italy and Germany are very limited. Nevertheless, the experience of converting companies in the ship- and tank-building industries (Voß, 1992) shows that the creation of civilian divisions in such companies

can succeed in the mid-term. But support by both management and the workers is necessary. Great Britain also has examples of companies that took advantage of market openings to diversify despite a lack of public funding. Weapons production made up 75 percent of the jet engine manufacturer Rolls-Royce in the 1970s; civilian production is now 75 percent of the total. Rolls-Royce did, however, continue to produce very similar kinds of products and was thus able to concentrate on its core capabilities.

The prospects for successful conversion can be improved if broader industrial policy also supports the transformation process. Conversion must be seen as an investment process that only bears fruit after many years. In the view of the authors, the conditions for this are better in Germany and Italy than in England and Spain. But even in Germany and Italy, employment can only be adequately secured in the short-term if the firms receive sufficient public funding. Empty government coffers make this unlikely. Issues of competitiveness would also make it problematic.

In Great Britain, the chances of creating additional jobs in other industrial sectors is small in view of ongoing "de-industrialization." The substantial cutback in military orders in recent years has not been compensated for by commensurate diversification. The main strategy of management in British arms manufacturers has been to seek out and secure "monopoly positions" in certain niches of the arms market through mergers and acquisitions. Less lucrative (weapons) divisions have been sold off.

Managers determine the strategic orientation of their companies on the basis of past experiences with government's behaviour. Thus, a decision in 1992 not to build the Eurofighter would have greatly strengthened the diversification efforts of the firms. Yet weak security policy rationales and arguments about keeping a minimal level of national arms production capabilities have kept the program going. This clearly reduces the willingness of both management and workers to develop and professionally implement alternatives to arms sales.

As a rule, most of those affected take a wait-and-see attitude towards the future orientation of a firm. But lobbying activities in support of new military programs increase. If a company has failed to take precautionary measures, the cancellation of a weapons system often only leaves the option of cutting the labor force—or even closing the company.

Yet the end of a weapons program can be seen long before it occurs; a decline in demand is thus relatively predictable. A timely analysis of the endogenous potential of a company could help to secure new product lines and business opportunities. However, it is not only the dearth of sound product ideas that makes conversion and diversification so difficult. Management and marketing methods have their shortcomings; business practices and structures often require change (Technologiestiftung Schleswig-Holstein, 1994).

Restructuring requires significant effort from both management and the workforce. As difficulties are unavoidable, these activities are not always crowned by success. Yet negative experiences with diversification also exist in other industrial branches. They do not speak in principle against the possibility of reorganizing and reorienting specific parts of the arms industry. For this reason, the following section will evaluate all the possible courses of action—including cancellation of the Eurofighter's production.

Assessment of possible options

The following scenarios do not claim to fully depict corresponding future developments. Economic processes on the scale of the Eurofighter program are too complex for such an undertaking, even if one concentrates on only a few selected aspects. The scenarios can help, however, to assess the military project from different angles.

In the following tables, these signs offer a comparison with the status quo:

+	conceivable advantages
+ +	probable advantages
+ + +	great advantages
-	controversial discussion likely; compensation for disadvantages likely
- -	improbable at present; only conceivable if disadvantages are compensated for
- - -	inconceivable at present
?	currently not possible to evaluate

The difficulty of acquiring data on these subjects means that the authors were not always able to completely answer all the questions raised by the various scenarios.

The status quo scenario: procurement of the Eurofighter

The status quo scenario operates on the assumption that the four countries involved will jointly complete the Eurofighter program as planned. Little substantive debates would result from such decisions in Spain, Italy and Great Britain; support for the project is currently secure not only in military circles, but also among the public. However, external influences could change public opinion, e.g. if Germany were to abandon the

Table 4: Procurement of the Eurofighter as planned (status quo scenario)

	Spain	*Italy*	*Germany*	*Britain*
Air force planning	satisfied	satisfied	open	satisfied
Political acceptance	sufficient	sufficient	controversial	high
Procurement costs	very high, problematic	very high, but acceptable in the case of limited units	alarmingly high, causing burdens	very high, but acceptable
Defense industrial dependence	very high	high	substantial	very high
Technology policy	important	secondary	secondary	important
Short-term conversion possibilities on company level	little	little	little	very little

project. A change of mood would be particularly likely in Spain, where fears of cost increases have existed since the beginning of the project. Procurement of the Eurofighter as planned would largely have results as already described in Table 1.

By contrast, Germany will likely again see heated debate before a final decision on procurement of the Eurofighter is made. The outcome of the debate in Germany is still uncertain: the Eurofighter does not fully match the requirements of current security policy and the costs of procurement will be alarmingly high.

It is not certain that the four countries really need a new aircraft. But if they do, one of the essential criteria will be the relative procurement costs of the Eurofighter and any other comparable aircraft type. Such an assessment needs to take into account the export prospects for the Eurofighter. The authors of the country case studies judge these to be relatively low. They come to this conclusion on the basis of the economic situation of most of the potential buyer countries and the export trends of recent years, which have seen sales abroad shift to more “low-tech” aircraft. Moreover, competition has intensified, above all from the United States. Significant cost reductions through the export of Eurofighter aircraft are thus unlikely.

Table 5: Cancellation of the Eurofighter without alternative

Effects on :	*Spain*	*Italy*	*Germany*	*Britain*
Air force planning	- -	- - -	-	- - -
Procurement costs	+ + +	+ + +	+ + +	+ + +
Technology	-	-	-	- -
Industry in general	- -	-	-	- - -
Affected arms industry	- - -	- -	- -	- - -
Conversion possibilities	-	- -	- -	-
Political acceptance	- -	- -	-	- - -

Table 6: No Eurofighter production— purchase an alternative aircraft

Effects on :	*Spain*	*Italy*	*Germany*	*Britain*
No Eurofighter production, alternative purchase "off-the shelf"				
Air force planning	+ +	+ +	?	-
Procurement costs	+	+ +	+ +	+ +
Technology	-	-	-	- -
Industry in general	-	-	-	- -
Affected arms industry	- - -	- - -	- - -	- - -
Conversion possibilities	-	- -	- -	-
Political acceptance	?	- -	-	- - -
No Eurofighter production, alternative purchase with license production				
Air force planning	+ +	+ +	?	-
Procurement costs	+	+	+	+
Technology	?	-	-	- - -
Industry in general	-	-	-	- -
Affected arms industry	- -	- -	- -	- - -
Conversion possibilities	-	-	-	-
Political acceptance	?	-	-	- - -
No Eurofighter production, alternative purchase with offset production				
Air force planning	+ +	+ +	?	-
Procurement costs	+	+	+	+
Technology	+	-	-	- -
Industry in general	+	+	+	- -
Affected arms industry	?	?	?	?
Conversion possibilities	+	+ +	+ +	+
Political acceptance	+	-	-	- -

Cancellation of the Eurofighter program and no alternative

This scenario only seems possible for Germany, although other countries would also gain at least temporary financial relief from a decision to buy neither the Eurofighter nor another aircraft. This positive aspect would be overshadowed, however, by the consequences in the areas of security, industrial and technology policy. The limited prospects of conversion would also have negative employment consequences in the short run.

It is unlikely that either Italy or Great Britain will see serious discussion of such a possibility. Nevertheless, were Germany to cancel its participation, other countries would certainly reopen discussion of both the Eurofighter and its possible alternatives. This would not have any influence on a production decision in Great Britain. The reaction of the Spanish government and public appears less certain in this respect.

It is often asserted that "irreparable damage" to the Alliance would result from Germany unilaterally withdrawing from the procurement phase of the program. Yet according to Huffschmid, experience with other cooperation projects does not corroborate this. International cooperation projects have frequently been terminated when one of the cooperation partners withdrew.

A further complicating factor for the Eurofighter is that the development phase is already finished: if the other three partners wanted to move on to production of the costly project, the pressure to export would intensify with the rising costs of the aircraft. The withdrawal of a partner country (which would perhaps seek an alternative aircraft) would further reduce, if not eliminate the aircraft's already limited export chances.

Were a partner country to reject the aircraft, potential buyers would, at a minimum, lose confidence in the aircraft. If export expectations were not fulfilled in such a situation, these failures would be projected onto the partner that had ended its participation. The consequence could be a short-term worsening of Alliance relations.

In the long-term, such a decision should not have a negative impact on a well-functioning organization. In view of the diverse technological difficulties and the price dynamics encountered during the project's history, the abandonment of the project by one of the partners should in no way be viewed as a surprise. Industry was frequently unable to fulfill the expectations (in terms of both time and cost) that it had helped to create. Should a country decide to exit the program, it would be in the context of a long history of project problems.

No Eurofighter production—purchase an alternative aircraft

Should one or more of the partner countries abandon their commitment to production, there would still be a number of alternatives. These would also close the ostensible security gap that would be left open by cancellation of the Eurofighter. First, an already-developed aircraft could be bought immediately "off-the-shelf" from abroad. Second, the aircraft could be purchased but produced under license. Third, an alternative aircraft could be bought but with offset production.

In Germany these alternatives have been studied for some time (see Bundesrechnungshof, 1994; *Wehrtechnik*, 1992, p. 7) These studies show that the European Fighter Aircraft was the optimal aircraft for the German air force, "but not at any price." From the German perspective, a precise military evaluation of the Eurofighter is only possible in the context of an evaluation of its total cost. As far as their security needs are concerned, the Italians would probably benefit from buying an alternative aircraft, whereas the British would suffer. The three alternative scenarios differ primarily in terms of procurement cost, impact on technology policy and conversion possibilities.

Purchasing a fighter that has already been developed instead of the Eurofighter would generate significant savings (as long as opportunity costs are excluded from consideration). In view of widely expected cost increases for the Eurofighter, the alternatives of license production or offset production are also probably less expensive.

As these options involve similar or even higher employment levels, the primary difference would be in regard to the military-technological base of the countries. British Aerospace, but possibly also CASA and DASA, could suffer under such an arrangement. Yet one has to ask whether this process would take place anyway as the development work on the Eurofighter is complete. In order to maintain existing military research and development capacities, another aircraft would have to now be begun. The Future Large Aircraft and the Experimental Aircraft are two possible candidates for such development work.

The option of offset production would be particularly beneficial in terms of its conversion potential. The overall industrial strength of Germany and Italy would allow them to benefit in particular. Even if the offset agreement was limited to military production, the prospects for maintaining employment in the affected sectors would still improve. In the latter two alternatives, the jobs argument would lose much of its validity; only the maintenance of a military-technological base could be the subject of continued controversy.

Concentrating Eurofighter production in Great Britain

Great Britain's announcement that it would build the Eurofighter alone if necessary has opened up another alternative for the partner countries: purchasing the Eurofighter directly from Britain. Yet this possibility is seldom discussed. Assuming that a new aircraft must be bought, this option would offer a number of advantages that merit serious consideration. Germany, Italy and Spain would not participate in the final assembly of the Eurofighter, but they would purchase the aircraft. Production would be concentrated in Great Britain, to the extent economically feasible (Table 7). At the same time, other partner countries could concentrate on the assembly of certain subcomponents as compensation for the loss of a role in the final assembly.

Table 7: Final assembly in Great Britain without compensation to the other partners

	Spain	*Italy*	*Germany*	*Britain*
Procurement costs	+ +	+ +	+ +	+ +
Technology policy	- -	- -	- -	+ +
Industry in general	-	-	-	+ +
Affected arms industry	- - -	- -	- -	+ + +
Conversion possibilities	-	-	-	- -
Political acceptance	- -	- -	- -	+ + +

Table 8: Final assembly for all countries in the UK only, with full offset compensation (mainly civilian)

	Spain	*Italy*	*Germany*	*Britain*
Procurement costs	+	+	+	+
Technology policy	+	-	-	+ +
Industry in general	+	+	+	-
Affected arms industry	?	?	?	+
Conversion possibilities	+	+	+	- - -
Political acceptance	?	?	?	?

The air forces involved would be unlikely to change their military-strategic assessment of the Eurofighter relative to the status quo scenario. But concentrating production will likely lead to savings for all the partners.

The advantages in the other categories go primarily to Great Britain. Controversy is thus likely in the other countries—indeed, such a course is probably politically unacceptable. The other partner countries would not only be immediately abandoning certain parts of their national military industrial base, they would also be facing significant job losses. Canceling the production of the Eurofighter would thus need to be embedded in a comprehensive political-economic strategy. In this context, three paths are possible: one primarily focused on the civilian sector; one involving the military sector; and a mix of the two.

The civilian orientation would aim at "compensation" for the lost assembly packages (Table 8). The advantages of this strategy are clear: The jobs that are threatened or lost by the termination of military contracts would be preserved by civilian production—to a degree in the same firm, but also in other firms. Overall, the employment level would remain high and the civilian sectors of the economy would strengthen over the mid-term. However, the unavailability of information prevents a precise estimate of the actual price benefits.

The success of such a program would be dependent on the ability to join new civilian-oriented organizational forms with military ones. British industry, however, would grow increasingly dependent on weapons production. This might in turn pose a danger to the competitiveness of civilian sectors —at a time military demand is shrinking worldwide.

Prospects

The previous sections focused narrowly on the Eurofighter. On the basis of the country studies, they assessed the possible effects on specific factors of various procurement and production alternatives. Even though the analysis covered only a limited number of aspects, a definite judgement was not always possible. Political decisions require the consideration of even more factors —factors which are often not amenable to quantification.

Policy towards European integration is, of course, a particularly important aspect. This also involves the question of a European defense policy and the related issue of a (West) European arms market.

Greater integration of what are still nationally structured arms markets has become even more important in the context of falling demand for military products (Walker, Gummett, 1993; Hartley and Cox, 1992). The incorporation of the Independent European Program Group (IEPG), and its simultaneous redesignation as the West European Armaments Group (WEAG), has given the West European Union greater responsibility for bringing together the West European arms industry. Up to now, there has been no ascertainable success in this direction. The WEAG, in the context of a special study group, has analyzed the possibility of a European Arms Procurement Agency. Broad agreement existed that only with the help of a common procurement system could a truly (West) European arms industry be developed. However, the manner for concretely implementing such a proposal remains unclear as does the question of who would carry which responsibilities.

As such, neither political nor industrial actors expect that a central West European procurement agency and the competitive letting of contracts could quickly lead to an integration of the European arms market. It is much more likely that less accentuated political concepts, reflecting national positions, will predominate. Cooperative projects will thus play a central role.

In this context, the Eurofighter has a high symbolic value. It is true that France, the country with which Germany has cooperated the most in the past, is not part of the project. Nevertheless, four countries are cooperating closely in what is otherwise a very fragmented market.

The organization of this weapon program suffers from one particular shortcoming: its very specific political agreements on the division of labor are oriented primarily towards maintaining the industrial status quo established during the Cold War. The form of cooperation selected for the Eurofighter appears to have little potential for addressing future economic, technological and financial challenges in the military sector.

Could not Germany's abandonment of the production of the Eurofighter be connected with a restructuring of the fragmented and inefficient military technology industry in Western Europe? If security interests prevail in regard to the procurement of a new fighter aircraft, and if the Eurofighter fulfills the criteria set by the military, then the question automatically arises of whether British producers could alone cover this demand.

Abandoning the Eurofighter's final assembly in Germany and concentrating it in the United Kingdom could coincide with a parallel concentration of tank, warship and helicopter production. In these areas, Britain would be obliged to procure military goods from other countries. With the help of this arrangement, oversized arms capacities in Western Europe could be quickly reduced. According to the European Commission, considerable public resources could thereby be saved without incurring any security risk. However, numerous firms in the affected countries would face the challenge of reorienting their production.

Producing the Eurofighter in all four countries is likely to delay this necessary restructuring. Superfluous capacities would be maintained at considerable taxpayer expense. The "spin-off" argument will be weaker with the next generation of weapons, yet the restructuring process would have been delayed.

Another factor that is difficult to quantify is the role of exports, which involves primarily financial considerations. The four partner countries have very different views of the Eurofighter's export potential. Britain also has important political reasons for wanting to export: arms exports are intended to underline that Britain is still a global power. In Germany export policy is less clear. Although the conservative-liberal government is officially committed to a restrictive arms-export policy, Germany has been among the world's biggest exporters in recent years. This is primarily the result of exporting used weapons.

Concentrating arms production on a West European scale could reduce the pressure to export arms to third countries in order to maintain national "minimum capacities." Yet

such a development would require a West European arms export policy, which is as unlikely as a central arms procurement system.

The future security policy of West European countries is a third aspect that must be taken into account. In terms of its origins and its specifications, the Eurofighter is a relic of the Cold War. Politically, Britain has had little difficulty redesignating the fighter as an important contribution to overseas operations. In comparison to Germany, the Italian government has also had an easier time defining a new, post-Cold War role for the fighter.

The German defense ministry is reconfiguring the Bundeswehr for crisis management and conflict prevention, including operations outside the NATO area. In the short-term, German out-of-area activities will probably be more dependent on transport than on fighter aircraft. In view of tight budgets, the procurement of the Eurofighter might obstruct the German government's plans for giving the Bundeswehr an out-of-area capability. One must also ask why the current opportunities for a further limitation of fighter aircraft inventories in Europe are not being explored at the negotiating table.

A fourth aspect is the manner in which these dysfunctionalities result from interest groups who enjoy clear advantages because of their lobbying activities. The current democratic-pluralist political system is characterized by a balance of power that is based on a network of associations, parties and state institutions at all levels. This balance of power stems from a multitude of conflicts that have been fought out in the past. A more or less effective, but unyielding representation of interests is the result. The system thus tends towards "institutional immobility" (Scharpf, 1973) that gives special interests structural advantages over more general, but less-well articulated and consolidated interests. The arms industry in general, and the aviation industry in particular, is especially well-organized and structured. Even organizations such as trade unions are well-integrated into this system. As such, these groups represent their interests through lobbying better than less well-organized associations. For example, far more actors and interests would have to coordinate their activities to achieve significantly greater public funding for the solar power industry.

The arguments of the arms industry lobby would probably be less potent if the conversion to civilian production had been more successful in the past. The relatively limited success of such efforts is mainly caused by two circumstances.

First, conversion usually requires considerable investment—at least if diversification is to be directed into other hi-tech areas. Market conditions will not always allow this funding to take place within the firms or to come from external creditors. Public funding will sometimes be required. To be successful, the funding will have to be significantly more generous than it currently is in the European Union's KONVER program.

Second, successful conversion and diversification efforts are dependent primarily on the attitude changes among management and the labor force (Grundmann et al., 1995). In some companies, it is not one group that resents changes in the business culture, but both management and the labor force that need to change attitudes to make conversion posssible.

If government policy aims to advance the conversion process by providing support, then it faces a dilemma: on the one hand, governments want to increase the number of high-qualified jobs. On the other hand, out-dated company cultures often make restructuring a very expensive endeavor. Inflexibility on the part of the companies should not be rewarded. No one should be able to redefine "minimal capacities in the national defense industrial base" or "conversion" to mean wasting public funds. The continued existence of every company cannot be guaranteed; this is true for both defense-related companies that want to stay in the military business and those that have diversified into civilian sectors. Instead, restructuring must be aimed at creating sustainable and efficient structures to provide stable employment.

It is widely recognized that in the short-term, the process of adaptation to market conditions does not always lead to the desired results. Support for the transition is necessary, but it needs to be integrated into a broader national and (West) European industrial policy towards the military and civilian aviation industry and technology-related sectors.

Even if the German government decides to procure the Eurofighter, the structural problems of West Europe's aviation and defense-related industries will remain. There is an urgent need for adaptation in the near future—adaptation that cannot be achieved at a national level. A comprehensive restructuring of this sector at the European and even world-wide level is unavailable. The Eurofighter program, as currently planned, is not contributing for a visible future.

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