Chapter 12

US — Swiss F-5 Transaction and the Evolution of Swiss Offset Policy[1]

Bernard Udis
Department of Economics
University of Colorado at Boulder, USA

12.1 Introduction

After the conclusion of World War II Switzerland passed through a series of dependencies on other countries for military aircraft. Britain and France were the major suppliers. The Swiss first purchased the DeHavilland Vampire and later produced under license the DeHavilland Venom. The Hawker Hunter was also purchased from Britain. It was assembled in Switzerland after refurbishment and modernization in the United Kingdom (UK). In mid-1961 the Swiss Parliament made a decision to fund the acquisition of the French Dassault Mirage III aircraft under license.

The Mirage III project proved quite disappointing for a variety of reasons[2] which resulted in substantial cost overruns[3] and technical difficulties. This project had been set up with a fixed budget, which the Swiss government was unwilling to expand. Consequently, the original goal of acquiring one hundred aircraft was unmet and fifty-seven were actually acquired. The Mirage III experience (still described in some Swiss circles as a "debacle") led to the reorganization of the Swiss military procurement system. In 1968 a new civilian-controlled organization, the Defense Technology and Procurement Agency (GRD for the initials of the German words) was established to handle procurement matters.[4] Shortly thereafter, in response to a perceived need for a ground attack aircraft a competition was encouraged among interested suppliers and the finalists appeared to be the A7G "Corsair" of LTV Corporation of the US and the French Dassault Mirage "Milan" — a follow-on version of the Mirage III with improved air-to-ground capabilities. After a lengthy competition, the GRD announced a decision to buy neither aircraft.[5] This left a void in the Swiss arsenal which was temporarily addressed by the purchase of additional Hawker Hunters.

By the early 1970s it was clear that the Swiss had reached a critical point in developing a policy to acquire modern weapon systems — particularly aircraft. While at that time the Swiss mechanical and engineering industry was widely

acknowledged to be of high quality, the aerospace industry was lagging far behind that of neighboring countries and also behind the other armed European neutral — Sweden. The postwar experience indicated an unwillingness on the part of the government to provide the financial support which would have been necessary to develop and sustain an advanced domestic aircraft industry with an indigenous design capability. The challenge was to obtain modern military aircraft in such a way as to acquire repair, maintenance, and modification capability for the life cycle of the weapon system and to counter the political charges that "defense francs" were leaving the country when foreign military equipment was purchased. Continued production at home under license of increasingly sophisticated aircraft in small numbers appeared no longer viable — either economically or technically.

12.2 The F-5 Case

The apparent answer was to be found in ordering foreign military equipment but requiring offset commitments as a form of additional *quid pro quo*. By 1975 the Swiss government was considering the acquisition of modern military aircraft and in June of that year agreed to buy the F-5 E/F aircraft from the Northrop Corporation of the United States through the US Defense Department under its Foreign Military Sales program. What turned out to be the first of two orders was designated Peace Alps I and comprised seventy-two aircraft. It carried an offset obligation of at least 30% of program value which was to be conducted on a "best efforts" basis with no penalties for failure to meet the target percentage. A relatively brief and simple Memorandum of Understanding (MOU) was signed by the defense ministers of the two countries in early July of 1975. The document was designed to set the framework for the offset commitment which was to be borne essentially by the principal contractors, Northrop and General Electric (GE), with a back-up role for the US Department of Defense. The Department of Defense also agreed to (a) waive the cost of import duties in evaluating solicitations from Swiss industry and provide duty-free entry certificates, (b) give special consideration to Swiss industry tenders to bid on a competitive basis, (c) seriously attempt to have technical data necessary for production made available to Swiss contractors at reasonable cost, (d) ensure that necessary export licenses for the preparation of bid packages were made available and (e) provide a waiver of US buy national laws and rules.

In turn, the Swiss Federal Military Department agreed to aid Swiss firms in making their capabilities and products known to possible American buyers, in coordinating the efforts of Swiss industry in responding to US offers, and in accommodating US requirements for handling classified information.

The agreement was effective for eight years and provided for monitoring by project officers of progress toward meeting the objectives of the MOU on at least an annual basis. In addition, government and industry representatives from both sides were to meet every two years to review progress as well. Of particular importance was the portion of Paragraph 3 that provided for US Department of Defense augmentation of industry efforts to meet offset commitments if it appeared that private efforts alone would fail to meet offset goals by the expiration of the MOU.

During the first several years of the project, progress toward meeting offset commitments was slow. This was a common complaint in Switzerland expressed by government and industry officials. In retrospect observers on both sides agree that a combination of inexperience and naivete contributed to the early delays and disappointments. The main US contractors, Northrop and General Electric, were still learning their way through the offset maze and still trying to identify Swiss firms whose cost and quality characteristics made them attractive partners in offset ventures. In addition, in a series of cautionary observations, GE warned that it would take a long time to develop the toolings and skilled labor necessary to qualify Swiss firms to participate in producing engine parts.

Many Swiss firms, on the other hand, initially called upon US firms with a "here I am" attitude, expecting an order to be forthcoming almost automatically on the grounds of their nationality. There was also a rather widespread belief in Swiss industry that the Pentagon would direct subcontracts to Swiss firms. Thus, disappointments were frequently encountered by such firms unaware that their offers had to meet stringent quality and price standards, and that their managements must demonstrate a willingness to compete for contracts.

Swiss industry, not surprisingly, found the paperwork associated with selling to the US military confusing and burdensome. Some Swiss government officials also complain that US government procurement personnel and industry purchasing agents were not aware of the waiving of the Buy American Act by the US — Swiss Memorandum of Understanding. An early lesson learned was that each Swiss bid had to bear the statement "Entitled to Buy American Act Waiver". The Swiss fought to have the MOU published in the US *Defense Acquisition Regulations*. Swiss firms unsuccessful in their quest for orders from American contractors occasionally complained to the GRD and to the press with stories of unfair competition and protectionism.[6]

Much time was spent in steering committee meetings with representatives of Swiss industry determining the nature of the offset package and identifying those firms which would participate in the program. A central role was played by the trade association known by the initials of its German name — VSM, the Union of Swiss Machine Industries, which initially monitored offsets for the GRD. The Swiss pressed for emphasis on aerospace work. In the past many

smaller subcontractors had survived largely by manufacturing foreign aircraft under license. Since the F-5 was not to be produced under license, the survival of such firms was felt to depend upon their receipt of offset work. However, after detailed surveys of Swiss industry by the principal contractors, it was concluded that major participation by such firms in the direct production of the F-5 or its engines was not a viable option. Final assembly was to be conducted by the Swiss Federal Aircraft Factory (F+W) at Emmen and this consisted of the bulk of *direct* offsets on the aircraft. Thus, purchases of Swiss products from non-aerospace manufacturing industries would count in fulfillment of the offset commitment.

Even though *indirect* offsets (sales by Swiss firms not involving the F-5 aircraft) dominated in the F-5 project — accounting for approximately 85–90% of the offset commitment — to qualify for offset credit, the sales had to be made by Swiss firms which either were involved in defense work or could be. Thus, the sale of commercial items by a Swiss firm with a defense division was viewed as strengthening the entire firm and hence qualified for offset credit. The focus was not to increase the general welfare of Switzerland through reductions in unemployment (usually very low) or improvements in the balance of payments but rather upon assisting firms that would have received the orders had the weapon system been produced in Switzerland.[7] Such firms could become producers of items the Swiss military department would buy in the future. A paper by a one-time Swiss Armaments Chief emphasized that protection of the defense industrial base was a major goal of the offset program.[8] This is further indicated by the exclusion of such service industries as banking, insurance, and tourism from the list of Swiss industries with which transactions would count toward fulfilling offset obligations. High ranking GRD officials have described their offset policy as "armament policy, not economic policy" and as an "alternative method of pursuing goals of self sufficiency and maintaining readiness." (private conversation).

Another consideration in the MOU dealt with the issue of "additionality" or "causality". Thus Paragraph 4 (B) noted that in any computation of offset credits, "the primary test will be a mutual accord as to whether or not a given sale occurred as a result of efforts arising from this offset agreement." In the words of a high ranking Swiss Defense official, "We don't want to rebaptize established business relations as offsets. Some foreign firms look like archaeologists trying to find ancient transactions with Switzerland ..." which might quality for offset credits.

It is interesting to note that while ultimately both General Electric and Northrop were successful in meeting their offset obligations, the methods employed reflected the basic differences between the two firms. General Electric is a much larger and diversified company of which the GE engine division is

only a relatively small part (accounting for under 10% of total corporate sales during the Peace Alps period). Thus GE was able to meet almost all of its offset commitments within the parent corporation. Northrop, on the other hand, was forced to go out to F-5 subcontractors on several tiers as well as to recruit assistance from outside the F-5 project entirely in order to fulfill its commitments. Such efforts were successful and Northrop amassed an impressive record in providing marketing assistance to Swiss firms. Northrop's marketing skills and influence aided the sale of Swiss light aircraft abroad. However, in aircraft and related sales, self-imposed limitations by the Swiss occasionally caused a problem. In furtherance of Swiss neutrality, substantial legal obstacles existed to the export of military equipment. This led to a continual problem of defining what objects qualified as "military". Light trainer aircraft could be armed and transformed into light ground attack aircraft. GE originally considered having Swiss firms machine turbine blades but encountered obstacles because of its inability to meet a Swiss government requirement for certificates of end use to ensure that Swiss-made parts didn't end up as part of lethal systems in areas of conflict. While this requirement was subsequently eased, provision of parts and equipment for third country sales which were such a significant part of the offset success in the F-16 deal with Belgium, Netherlands, Norway, and Denmark were thus largely ruled out by Swiss law.

Despite such obstacles, Northrop demonstrated creative approaches to meeting its offset commitments. It went to some lengths to spread awareness of the quality of Swiss equipment and materials. For example, it purchased Swiss machine tools to demonstrate their high quality and installed Swiss roofing materials on Northrop buildings. During the later years of the project, Northrop also facilitated a three-way trade among firms in Switzerland, Spain and Australia in partial fulfillment of its offset commitments to the latter two countries under the terms of their F-18 purchases.

Offset officials at Northrop noted the importance of viewing offsets as more than a device to serve the customer's purposes, and recognizing that they can serve the seller's strategic interests as well. Both Northrop and GE continued their dealings with Swiss firms after the completion of their formal commitments under the Peace Alps programs. Officials of both firms explain that a major reason for such transactions was their discovery of reliable suppliers in Switzerland.[9]

As noted above, however, the F-5 offset program was slow in gaining momentum and the US Defense Department found itself obliged to intervene to insure that the official offset commitment was attained. In part this involved expanded direct purchases and attempts to encourage other US Government acquisitions of Swiss products. Substantial frustration resulted from head-on

encounters with trade restrictions other than the Buy American Act (See note 10). This contributed to a Pentagon decision to abandon this increasingly awkward role. On May 4, 1978, Deputy Secretary of Defense Charles Duncan signed a memorandum which effectively placed full responsibility for meeting any further offset commitment upon the US firm which had agreed to such conditions, removing the US government from any back-up role. This significant change in US offset policy was a direct consequence of the Swiss F-5 Program.

In October of 1980 an Amendment to the earlier Memorandum of Understanding was signed by the Defense Secretaries of the two counties providing for the purchase by the Swiss of "approximately 40 F-5 aircraft over and above that quantity covered by the basic ... MOU." The actual number of additional F-5 aircraft acquired was thirty eight. Paragraph 2 of the Amendment described its purpose as extending "the period of time during which Swiss industry will be allowed to compete with US industries for DoD contracts," with reciprocal access to Swiss Government defense contracting by US industry.

Paragraph 5 implicitly recognized the impact of the Duncan Memorandum. While the US Government commitments agreed upon under the original MOU would continue for the time period originally specified — eight years — no additional obligations would apply to the US Government in attaining additional offset goals associated with the subsequent F-5 purchases. However, the US Department of Defense agreed, upon the completion of its obligations under the basic MOU, to continue to provide the five trade-opening provisions originally accepted, albeit on a case-by-case basis (waiver of cost of import duties in evaluating defense solicitations, provision of technical data to Swiss contractors at reasonable cost, provision of export licenses, provision of duty-free certificates, and provision of waivers of buy national and balance of payments restrictions).[10]

The amendment, although signed in October 1980, was not to become effective until July 1983. It would remain in effect for four years — until mid-1987. This second purchase of F-5 aircraft became known as Peace Alps II. Of particular interest is the fact that this amendment to the original MOU dealt only with governmental responsibilities with no mention of particular firms or offset obligations. Such specific details were contained in separate agreements between the Swiss Government and the major contractors — Northrop and General Electric. The offset goal was raised to fifty per cent and a penalty for failure to meet the goal, liquidated damages, was included in the Northrop agreement. The penalty became moot as the offset goal was over-achieved. Indirect offsets also dominated transactions during Peace Alps II and their industrial distribution is shown in Table 1. F+W (Emmen) remained responsible for the bulk of assembly operations. Some components for the F-5 continued to be manufactured in Switzerland and there was some buyback of parts for the US Air Force T-38 trainer.

Table 1: Industrial Distribution of Indirect Offsets Received by Swiss Firms During Peace Alps II

	Percent
Aerospace	48
Machinery and Machine Tools	24
Precision Instruments and Tools	8
Electronics	4
All Others	16
Total	100

Source: Swiss Embassy, Washington, DC

Summary statistics of orders received in Switzerland under the F-5 offset program are presented in the Table 2. Data are presented separately for both parts of the Peace Alps Program and by principal source of such orders: Northrop, General Electric, and the US Department of Defense. Of interest is the decline in the US Defense Department's share of total offsets from 35.4 per cent in Peace Alps I to 10.9 per cent in Peace Alps II. To some extent this is a reflection of the influence of the Duncan memorandum of 1978 which was in full effect during Peace Alps II. On the other hand it should be noted that while

Table 2: Status of Orders at Program Conclusion in June 1987
Swiss Offset Program — Peace Alps I & II*

	Department of Defense	**General Electric**	**Northrop Corporation**	**Total US$**
Peace Alps I Status at conclusion, July 1983	77,747,712	48,385,427	93,634,573	219,767,712
Peace Alps II Status at conclusion, June 1987	33,309,574	62,072,225	210,088,483	305,470,237
Total for Peace Alps I & II	111,057,286	110,457,652	303,723,011	525,237,949

Source: Swiss Embassy, Washington, DC

* For purposes of comparison, the contract values in current dollars for the Swiss purchases were $340 million for Peace Alps I and $280 million for Peace Alps II. These figures do not include the value of missiles and spare parts which were purchased later.

this rule eliminated DoD's role as guarantor of offset commitments by private firms it did not prohibit continued purchases from abroad by DoD when such purchases were viewed as beneficial to US national security. Thus the $33.3 million of DoD purchases from Swiss industry during Peace Alps II fall into that category and represented orders to Swiss industries which were eligible for offset credit.

In retrospect, the Swiss F-5 deal appears to have had some unmistakably positive aspects. Switzerland was able to continue the modernization of its Air Force while Swiss financial goals were attained and US and other foreign firms became more aware of the capability and quality of Swiss industry. The F-5 offset deal also led to economies of experience which facilitated the negotiations and organization of the subsequent Swiss purchase of the US McDonnell-Douglas F-18 military aircraft, in which Northrop and General Electric also play significant roles. It clearly advanced Swiss technology. Thus, Pilatus established a numerical control facility as part of the F-5 offset program which later received forgings from Northrop to machine for the F-18, prior to the Swiss decision to purchase the F-18. Such work was banked as offset credits for the subsequent project. The Swiss are also still producing rudders and elevators for F-5s sold under the Pentagon's Foreign Military Sales (FMS) program. There are still substantial numbers of F-5s flying in the air fleets of many countries and the Swiss are one of the few sources of parts for those aircraft. This puts such Swiss producers in a potentially attractive position. Also, as noted earlier, Swiss aeroengine firms have had an active role in producing parts for the GE CFM-56 passenger jet engine. Technological spinoffs into Swiss industry can also be seen as contributing to the possibility that Swiss firms may participate more actively in joint European projects as Switzerland moves closer to the European Community.

A retrospective view of the F-5 transaction, however, shows mixed results within Swiss industry. Producers of major defense systems are seen by knowledgeable observers as having profited little. However, many firms producing parts for US defense goods profited well. Their employment grew and they were able to establish and maintain a presence in the US market as they broadened their clientele. Swiss producers of machine tools, instruments and parts also did quite well. However, Swiss observers note that such successes were temporary as they led to US Congressional retaliation via the establishment of additional nontariff barriers. Swiss machine tool producers have been frequent targets of such actions.

While there are some Swiss firms disappointed in their experience under the F-5 project, the Swiss government has used offsets since 1976 reflecting the view that offsets have, on balance been beneficial for Switzerland. In the words

of an official of the GRD "offsets are still a politically effective tool in keeping Swiss defense appropriations flowing and they helped the F-18 project receive parliamentary and popular approval."

This same official noted that there were losers during the F-5 project both in the US and Switzerland but that such firms were unable to prove their competitiveness. In his opinion winning Swiss firms did not underbid or "dump" but rather won on price and performance criteria. US contractors benefited from uncovering high quality suppliers previously unknown to them. Thus, GE purchased twenty 5-axis Swiss milling machines and claimed that "they had never seen such quality ... with reworking cut from 20% to 2%."

Concerning the F-5 as a weapon system, Swiss defense officials insist that they knew what they were buying when they decided to acquire it and they are very happy with it. In no sense is the F-5 viewed as a "lemon." Informed GRD officials point out that the F-5 was less expensive than the newer and more capable F-16 and that some saw the possible acquisition of the F-16 (then becoming a standard aircraft among smaller NATO member countries) as beset with political obstacles growing out of Swiss neutrality policy. Should the Swiss become interested in a midlife upgrading of their F-5 aircraft, several options are available to them. For example, Northrop has developed a series of upgrades to the F-5 aircraft that improve its avionics capabilities and alter its cockpit to mimic that of the F-16. This system of improvements converts the F-5 into a lead-in trainer for the F-16. A Canadian firm, Bristol Aerospace, has developed similar F-5 upgrades that alter its cockpit to resemble that of the F-18. This serves as a lead-in trainer for the Canadian CF-18 and ostensibly could play a similar role in the Swiss transition from the F-5 to the F-18.[11]

12.3 Swiss Offset Policy

The most commonly encountered view of offsets among traditional economic theorists is negative. The typical explanation for such hostility is the belief that since offsets most often change the results that would be encountered in an environment of free markets, they must therefore be trade diverting and welfare reducing. Swiss economists are not unlike their colleagues elsewhere in this respect — especially in such Swiss government departments as Commerce and Treasury. Such departments, however, have little influence in weapons acquisitions. Thus, as an official of the GRD put it, "Commerce disapproves of offsets and they can stand back with clean hands while we must dirty ours in actually dealing with offsets." On theoretical grounds, Swiss defense officials emphasize the absence of competitive markets for advanced weapon systems and doubt the

wisdom of denying themselves access to measures which they believe will strengthen the nation's defense.

Consequently procurement executives in the GRD have been instructed by the Minister of Defense "to insist on full economic compensation of funds spent abroad for major military equipment.[12] This compensation may be accomplished via direct participation (licensed production or co-production), or indirect participation which enables Swiss firms to sell their products and services to defense contractors and the US Department of Defense for work unrelated to the weapon system being acquired by Switzerland. While other rigid rules don't dictate the precise form of the compensation (offset), all major weapon system purchases by Switzerland since 1976 have been so compensated.[13] With few exceptions most Swiss military work is performed in military divisions of firms also producing civil products. Thus, even indirect offsets of a non-military character may still help sustain firms which constitute part of the Swiss mobilization and industrial base.

A former Swiss Armament Chief has identified the benefits of licensed production or co-production as follows:

"— simultaneous training of maintenance personnel during final assembly of equipment in Switzerland
— acquisition of production technology and skills
— upgrade and retrofit capability
— in-country spare parts and logistics support
— maintenance of mobilization base
— reduced dependence on foreign sources
— Swiss industry involvement and employment"[14]

The Swiss goal in indirect participation or offsets is to gain equal access to foreign procurement offices and to contracts for goods and services not directly related to the military products being purchased by the Swiss. Here the objective is to obtain entry into new markets abroad for firms in the Swiss mobilization and industrial base. Agreements in the offset context are often aimed at penetrating markets previously protected by company or government imposed restrictions and barriers such as "buy national" laws. In the Swiss case the most frequent forms of indirect offsets have been the purchase of Swiss goods, provision of marketing assistance to Swiss firms, licensing of technology, R&D collaboration and various forms of training.[15]

Following the successful conclusion of the F-5 project in 1987 the two governments negotiated a new Memorandum of Understanding which took effect on November 1, 1988. This MOU provides for mutual access to the defense markets of each party together with a waiver of "buy national" preferences and import duties for military products. The agreement has been extended several times and

its current expiration date is December 31, 1997. A continuing source of frustration to the Swiss has been the continued application of US statutory and regulatory restrictions on DoD procurement that are not subject to the waiver. These restrictions on the foreign sourcing of specific products such as precision instruments, hand and machine tools, forgings, castings, and precision elements have denied opportunities to Swiss industry.[16] While the Swiss have sold some military products to the Pentagon, one that appeared to represent a significant penetration of the US defense market, the Air Defense and Anti-Tank System (ADATS) which the US Army had selected for use in its Forward Area Air Defense System (FAADS) was subsequently cancelled, ostensibly for technical reasons.

Of particular interest is a sentence in the Amendment to the MOU which extended it to the end of calendar year 1997. This Amendment, which became effective February 5, 1990, states that:

"The Governments agree to discuss measures to limit the adverse effects of offsets on the defense industrial base of each country."

This language is responsive to section 82J(C)(2) of the National Defense Authorization Act, Fiscal Year (FY) 1989 (102 Stat. 1918) as amended by the similar act for FY's 1990 and 1991 approved November 29, 1989. The actual act reads as follows:

"In negotiating or renegotiation of any memorandum of understanding between the United States and one or more foreign countries relating to reciprocal procurement of defense equipment and supplies or research and development, the President shall make every effort to achieve an agreement with the country or countries concerned that would limit the adverse effects that offset arrangements have on the defense industrial base of the United States ..."

A former US Executive Branch official concerned with offsets has described this congressional requirement as "absurd" since a) "who could possibly sign up to the last clause," and b) "such instructions violate separation of powers and are known to be frivolous by the authors who use such to get in digs which can later be used politically because the public isn't that sophisticated." In fact, there have been no discussions between the Swiss and US governments over the "adverse effects of offsets" since the parties have perceived no such effects. This is a good example of how the Executive Branch finesses an unenforceable instruction.

12.4 Swiss Parliamentary Attitudes Toward Offsets

The use of offsets has been accepted by the Parliament despite the belief that offset arrangements add to the cost of weapons compared to the option of buying

from the supplier on an off-the-shelf basis. The aforementioned presumed advantages have convinced the Swiss Parliament that a cost premium of ten per cent or less on direct offsets (coproduction) is a reasonable price to pay for a well-designed offset program. If the premium exceeds ten per cent, the deal must be evaluated on a case-by-case basis. This informal rule of thumb policy has been in effect since Peace Alps II and it was operative in the more recent Swiss decision to purchase the US F-18 military aircraft under terms of a 100 per cent offset agreement.

Nevertheless, an impartial observer of the operation of the 10% rule must add some *caveats*. A nagging question concerns the accuracy of the cost estimates. For example, much of the assembly work is done at the Federal Aircraft Factory at Emmen which employs some seven hundred employees. There exists at least the possibility of "creative accounting" which might keep the reported increment of costs over those of an off-the-shelf purchase below the 10 per cent level. This point is not raised to suggest deliberate distortion but rather to emphasize the complexities of applying anything approaching a precise form of benefit-cost analysis to offsets. Hartley, calling upon public choice theory reminds us that "Government decisions are likely to be the result of actions by various agents and interest groups in the political market, acting in their own self-interest and seeking to influence policy in their favour."[17] Recognition of this fact explains why knowledgeable US observers have characterized much that transpires in the offset area as "smoke and mirrors."

12.5 Current Swiss Offset Policy

The 10% cost differential rule of thumb still applies as a criterion on direct offsets (coproduction). Thus the Swiss recognize that offsets are not "free." Offsets now are firmly implanted in Swiss military procurement and there is little chance of their being abandoned anytime soon. The prevailing view is that they provide a unique means to attain important Swiss armament objectives.

The Swiss have raised minimum contract values below which they will not insist on offsets. Thus, while earlier all contracts valued at more than 10 million Swiss francs required offset provisions now that requirement no longer applies to purchases below 50 million francs. This change in policy was made in the early 1990s and was motivated by the goal of reducing the burden of administrative costs on relatively small contracts.

The procedure for accounting for offsets has also been changed to ease the administration of offset programs. Thus, previously the Swiss government contacted Swiss firms subsequent to the receipt of a claim from a US (foreign) com-

pany to confirm a transaction eligible for offset credit. Now Swiss firms must sign a statement attesting to the fact that a foreign purchase was made as part of an offset deal.

Another change deals with the required offset percentage of contract value. As noted previously, the offset goal increased from 30% during Peace Alps I to 50% in Peace Alps II. In the current F-18 project the offset goal has been established at 100%. As a GRD official observed, "The going offset percentage has been increasingly climbing and we Swiss didn't wish to be left behind."

Endnotes

1. Sources of material in this section consist essentially of interviews conducted among government, industry, and trade association officials in the United States and Switzerland and with Swiss diplomatic representatives in the United States. The meetings in Switzerland were held in May 1977 and the more recent ones in May of 1989 and 1991. The author wishes to acknowledge his gratitude for the generous and frank comments of all the participants — Swiss and American. For a variety of reasons, maintaining the anonymity of sources is the standard approach in this type of paper. However, the depth of knowledge in this area of one person and his apparent unlimited patience and willingness to share it demands recognition. I refer to Werner Kaelin, representative of the Defense Technology and Procurement Agency at the Swiss Embassy in Washington, whose generous assistance is gratefully acknowledged. Any remaining errors of fact or interpretation are the complete responsibility of the author.

2. Many of the problems with the Mirage III resulted from an over-ambitious effort by the Swiss to integrate a Hughes Aircraft avionics system and "Falcon" missile system into an adequate French aircraft, which was not designed to operate with such systems.

3. Anticipated program costs for the Mirage III grew from approximately 43–48 million Swiss Francs in 1961 to 356 million francs in 1964. Schwartzenberger, Oats, **Operation Zero: Switzerland Searches for a Combat Aircraft**, p. 5. The English translation of the Moser book (see notes 4 and 5) was privately reproduced in 1973.

4. The information in the text on the number of Mirage III aircraft acquired and the establishment of the GRD are taken from an English translation of Moser's book, by a then-LTV official, Schwartzenberger, *op. cit.*, pp. 5 and 9.

5. This surprising decision is analyzed in a book by a Swiss journalist, Moser, Sepp, **Operation Null:Die Schweiz Sucht ein Kampfflugzeug**. Zurich: Flamberg-Verlag, 1973. Apparently the highest ranking officers of the Swiss military were unable to heal a split over the mission and capabilities which the new aircraft was expected to perform and meet. The Corsair A-7 was a subsonic ground attack aircraft while high ranking Swiss officers were arguing for the acquisition of a supersonic fighter. Other factors also contributed to the infamous "null" decision.

6. The flames were fueled when the major Swiss producer of power plant equipment, Brown-Boveri, originally low bidder to supply electric drives for components in the Clinch River, Tennessee power generating plant of the Tennessee Valley Authority saw its victory rapidly disappear when the director of the Energy Research and Development Administration awarded the contract to GE. The Swiss claim that US officials estimated an excessively high cost escalation rate for Brown-Boveri; added US customs duties; and a 6% per cent penalty under the terms of the Buy American Act in order to drive the total Swiss price above the GE bid. More than sixteen years later this event is still brought forward as an example of US duplicity.

7. Thus, the Swiss government provided financial aid to the aircraft firm Pilatus as it invested in heavy milling machines and numerical control machine technology. In addition, near the conclusion of Peace Alps I and through the remainder of the subsequently expanded F-5 project, Swiss aeroengine firms produced parts for the GE CFM-56 engine used on the Boeing 737 passenger aircraft.

8. Wittlin, Felix M., "**Swiss Industry Participation in Foreign Arms Procurement**," *NATO'S Sixteen Nations*, Special Edition on Common Defense, 1989, pp. 71–73.

9. However, the likelihood that the Swiss would continue their aircraft modernization efforts and their willingness to "bank" some fraction of such purchases toward future offset commitments probably also contributed to continued US purchases following the completion of offset commitments under the F-5 Program.

10. It should be noted that "buy national preferences" in the United States affect government purchases only and operate much like a tariff. This preference traces to the Buy American Act of 1933. The Defense Department has adopted a policy under the Act of giving a fifty per cent preference margin to domestic producers while other government agencies offer a six per cent preference to American suppliers (or twelve per cent if the item is produced

by a "small" firm). However, a large number of outright restrictions and prohibitions on the purchase of foreign goods and components by defense agencies now exist. (For a recent study of such trade barriers, see *The Impact of Buy American Restrictions Affecting Defense Procurement, A Report to the United States Congress by the Secretary of Defense* (Washington: Department of Defense, July 1989)). The impact of waivers of Buy American Preferences such as those continued in the US-Swiss Memoranda of Understanding on such restrictions and prohibitions is not unequivocal.

11. Dornheim, Michael A., "**F-5 Cockpit Mimics F-16 with Northrop Upgrades**," *Aviation Week and Space Technology*, Vol. 139, No. 22 (November 29, 1993), pp. 56–57.
12. Wittlin, *op. cit.*, p. 72.
13. *Ibid.*
14. *Ibid.*
15. *Ibid.*
16. *Ibid.*, p. 73.
17. Hartley, Keith, **The Economics of Defence Policy**, London: Brasseys, UK, 1991, p. 62.

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