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THE TEMPLATE FOR THE ACQUISITION OF THE NEXT
MULTINATIONAL MULTI-ROLE FIGHTER

by

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ABSTRACT

There are many obstacles to an effective acquisition process in the US Air Force, including budget restrictions and schedule demands. This research assesses whether future programs involved in this process should use the MultiNational Fighter Program (MNFP) as the model to successfully overcome these many complications and problems. This effective program with many success stories began over 40 years ago as a unified international F-16 program and was instantly considered the 'Deal of the Century'. The consortium began after General Dynamics produced the compact YF-16, which was chosen in a fly-off as a light, agile fighter that could be produced in large numbers for the US Air Force Lightweight Fighter program.

Many North Atlantic Treaty Organization (NATO) partners, including the Netherlands, Norway, and Denmark, are currently cooperating partners in the acquisition of the next Multinational Multi-Role Fighter. Learning from F-16 Memorandum of Understanding (MOU), the F-35 MOU recognized benefits from the international cooperation regarding standardization, rationalization, and interoperability of military equipment and improving each country's mutual conventional defense capabilities through the application of emerging technologies.

This research confirms there were significant benefits to the creation of this unique teaming arrangement. Therefore, the conclusion of this report is that when each of the six individual countries purchased their F-16's for their fleet of multi-role fighters, this collaborative arrangement produced more than just a larger combined fleet of aircraft; these countries also strengthened their political bonds and global strength.

PREFACE

During my time spent in USAF Foreign Military Sales at the Air Force Security Assistance and Cooperation Directorate (AFSAC), I was provided a privilege to be put in the position as the Command Country Manager (CCM) for several of the European Participating Air Forces (EPAF) countries. Throughout this time, I was given an extensive education about the history of the Multi-National Fighter Program (MNFP) and its successes regarding the F-16 program. As I was accepted into the Air Command and Staff College/Online Masters Program (ACSC/OLMP), it became quite evident where I should focus my research and develop my thesis.

Participating in the entire ACSC/OLMP was a laborious and demanding program. While the education I earned from all of the professors in this program is invaluable, I would also like to thank my Research/Electives instructor and excellent advisor, Dr. Richard Smith, who helped me communicate my research into this final product. His aid over the last 16 weeks has been invaluable.

Finally, I offer my sincerest gratitude to my wife and children, for their patience with me while I diverted much of my attention during this enormous two and a half-year obligation. All of my children inspired me to maintain the extraordinary standards required for these classes and to continually strive for the higher grades. Much thanks and love go to my wife for her willingness to assist whenever I asked. As a devoted Catholic school teacher, her dedication and amazing educational skills allowed me the enormous amount of time to research, study, and understand the material required for these classes and paper while knowing that I had a strong educator and critic to lean on and our children were never left wanting the same with their own school work.

Thank you!

INTRODUCTION

There are many obstacles to an effective acquisition process in the US Air Force, including budget restrictions and schedule demands. This research assesses whether future programs involved in this process should use the MultiNational Fighter Program (MNFN) (Figure 1) as the model to successfully overcome these many complications and problems. From the initial research to determine the replacement for the F-105's, F-4's, and F-104's, the F-16 program was constructed using an unusual agreement creating a consortium between the United States and four North Atlantic Treaty Organization (NATO) countries: Belgium, Denmark, the Netherlands, and Norway.



Figure 1: Multinational Fighter Program Logo With All Six Participating Nations. ¹

Based on over 40 years of evolution and success of this unified F-16 program, the discussion concerns whether the development, construction, and organization of the European Participating Air Forces (EPAF) and the MNFP should be the international acquisition template for its replacement.

The F-16 is appropriately named the Fighting Falcon. This aircraft is a compact, multi-role fighter which has provided the United States and many of its NATO allies the strong advantage during air-to-surface attacks and the very important, air-to-air combat. Most of the successes of this aircraft are in part, due to the construction and organization of the MNFP initiated during the mid-1970's. This arrangement was created using a unique agreement which produced an exclusive consortium between the United States and four NATO countries: the Netherlands, Belgium, Denmark, and Norway. This consortium allowed the new assemblage of countries to acquire this leading edge fighter while limiting the costly development requirements, except for a pro rata share of the research and development cost for each aircraft, while gaining the benefits of production. It was stressed that, politically, production in Europe was indispensable to buying the aircraft. In turn, the EPG would procure an American fighter while the United States would still reap several military and economic benefits.²

HISTORY OF THE MNFP

The air battles during the Vietnam War were very costly to the United States. In totaling only the fighters, the U.S. Air Force lost 382 F-4's, 198 F-100's and 334 F-105's for a total of 914 fighters out of 1,737 total combat losses from February 1962 through October 31, 1973.³ After this unsuccessful era in US Air Force history, it was quite obvious the current fleet of fighters were unable complete their overall goal and mission to obtain air superiority, conduct long-range

bombing operations and destroy the enemy air forces. From the late 1960's to the early 1970's, the US Air Force searched for new type fighter with the best of air superiority in mind. ⁴ This requirement created the US Air Force Lightweight Fighter program, also known as the "Fighter Mafia", whose ultimate focus was to incorporate a variety of new and emerging technologies into an aircraft which would give the United States a dedicated air superiority fighter with high agility for close-in combat. ⁵

Lightweight Fighter Program

The majority of effort used in the Lightweight Fighter Program was focused on evaluating any apparent importance and consequences using selected technologies while reducing the risk in applying these to potential weapon systems. The 'Fighter Mafia' took extreme note of the swing-wing MiG-23 and the Mach 3 MiG-25, which arrived at the Moscow Air Show in 1967, and focused attention showed the world a newer version of the "high-end" fighter. ⁶ Ironically, neither the MiG-23 nor the MiG-25 met the expectations to be outstanding dogfighters. The early expectations for the capabilities of both aircraft were grossly exaggerated. Unknowingly, the US Air Force still perceived the requirement to meet or exceed these proficiencies and strived to develop a new aircraft capable of combat while maintaining a large Mach value at a high altitude, capable of carrying long-range radar guided missiles, and equipped with leading edge long range radar. The initial concerns for maintaining pace with these requirements produced the larger F-15. While this aircraft was able to maintain the advantage in a dogfight, the F-15 was still the large aircraft with the expensive solution. By the end of the 1960's, there was still no solution to supply the US Air Force with a light, agile fighter that could be produced in large numbers while complementing the smaller fleet of F-15's with higher capabilities.

To solve this dilemma, the Lightweight Fighter Program solicited proposals with specific requirements from numerous American manufacturers during January 1972.⁷ This Request For Proposal (RFP) prompted sales proposals from five major aircraft manufacturers in the United States, including Northrop, Boeing, Lockheed, General Dynamics, and Vought.⁸ The RFP required that the proposals be a focused effort around the design of the next air superiority lightweight fighter. Emphasized in that solicitation, was the request that General Dynamics and Northrop build their own prototypes, which would then be judged, assessed, and appraised. The caveat was there were be no guarantees of a follow-on production contract. The purpose of creating these prototypes was to provide a stringent selection of technology demonstrators. Both Northrop and General Dynamics were given specific but limited number of performance goals. They were also permitted the creative freedom to generate their specific version of a lightweight air superiority fighter. The resultant two prototypes competed in several "fly-offs" from 1972 to 1974.⁹ In the end, both contractors provided extremely competitive designs but in 1975, the YF-16 was declared the winner of the competition and awarded a production contract. During this time, the LWF was renamed the Air Combat Fighter (ACF) with expectation of attracting additional customers and financial support from other countries. Northrop's product was the twin-engine YF-17, which benefited from two high-thrust engines and a state-of-the-art aerodynamic technology. In stark contrast, General Dynamics' product was a significantly more compact aircraft, the YF-16, which had only a single engine. In the end, Northrop's YF-17 had earned significant respect from the US Navy and eventually matured into the F-18 Hornet to be used on aircraft carriers and eventually replace the aged F-14.¹⁰

In designing the F-16, there were several reliable attributes and technologies used and incorporated from other proven aircraft, such as the F-15 and F-111. The F-16 chose to use the

same Pratt & Whitney F100 turbofan engine.¹¹ In addition, a lightweight fuselage capability was added without reducing its strength. The winning model had a very pronounced chin-mounted inlet, swept wings, conventional tail surfaces, and the proposal first submitted by Boeing was changed very little when compared to the final winning F-16 design. The F-16 had won the fly-off using a conventional straight wing and a leading edge sweep which delivered the best in tradeoff between a low drag and maneuverability. This design also blended the wing root into the fuselage to offer greater overall aerodynamics to the system. These studies gave way to the ultimate Model 401-16B which was submitted by General Dynamics to answer the LWF RFP. Along with proven aerospace science used in these other aircraft, these attributes were added to the F-16 to simplify the airplane and reduce its maintenance costs and weight while maintaining a noticeably smaller size and price tag.

The final product was a new aircraft which provided an extremely maneuverable, airframe that could withstand 9 G's and, used a fly-by-wire flight control system, and four computers to help the aircraft maintain flight. The fly-by-wire made the F-16 more maneuverable than any earlier-generation fighter by removing direct cable and pulley connection from the pilot's controls to the aircraft's flight control surfaces. This also provided the pilot with a quadruple-redundant flight control system. The pilots were given a seat which reclined 30 degrees and a side-mounted control stick which would allow the pilot's arm to help cope with 9 G maneuvers. The F-16 also offered a reinforced airframe which enabled the F-16 to be the first fighter to survive 9 G's. The addition of a bubble canopy offered the pilot a 360-degree view which provided the pilot another advantage when striving to be the best air-to-air dogfighter. The addition of a "hands-on throttle and stick" provided the pilot with all of the vital buttons, switches, and toggles at his fingertips while removing the need for a back seat.¹²

The United States delivered a commitment to procure the F-16 on July 11, 1974, which provided a requirement for source selection by January 1, 1975, and gave the EPG several incentives to share in the F-16 program. This commitment permitted the EPG to participate in source selection and production. On January 13, 1975, the United States selected the F-16 aircraft and in June 1975, the EPG delivered their formal selection and agreement to join the United States in purchasing the F-16. ¹³



Figure 2: MNFP F-16 during MLU test and evaluation. ¹⁴

Because of the immediate successes to the program during the 1980s, the EPG decided to acquire an additional 169 F-16's, known as the "Follow-on Buy". The United States continued to develop the next generation aircraft, F-16C and D models, also known as the Agile Falcon. Because of the continued successes these newer C and D models were experiencing, the MNFP countries were eager for the opportunity in November 1987 to participate and pursue the F-16

Mid-Life Update (MLU) to upgrade their already extraordinary fighter with a glass cockpit and a Modular Mission Computer which would largely expand its effectiveness (Figure 3). This MLU would upgrade the EPAF Block 10 and Block 15 aircraft to a near Block 50 capability which would continue to keep the MNFP aircraft a common configuration. ¹⁵

While many were investigating the option to replace the F-16 during the late 1990's, this MLU would offer a cheaper option by upgrading its total capability and extending its overall life expectancy. This MLU included many upgrades which kept it at the top as the best all-weather multi-role fighter. These upgrades included a new Modular Mission Computer; a Fire Control Radar, the AN/APX-113(v) Advanced Identification Friend or Foe system, a modified air inlet would allow the F-16 to carry equipment such as the Forward Looking Infrared pod, Wide-Angle Conventional Head-Up Display, Multi-Function Display, Enhanced Upgraded Programmable Display Generator, Audio/Video Recorder, Helmet-Mounted Display, Up-Front Controls: Integrated Control Panel, Improved Data Modem, Digital Terrain System, Electronic Warfare System, an Automatic Targeting Hand-Off System, a Targeting Pod Interface, and a Maverick Missile Launch Envelope Implementation. Many of these new systems and upgrades were developed, tested, and installed in the EPG countries in agreement with the Memorandum of Understanding (MOU).¹⁶

After the successful implementation of the MLU across its fleets, the MNFP has continued to upgrade their F-16's over the next 15 years. Approved by the Steering Committee and using the processes defined in the MOU, the MNFP has installed a fatigue analysis system, modular reconnaissance pods, a Missile Approach Warning System, a digital imagery upgrade, and an

improved Litton AN/ALR-69 threat warning system. These have also been designed, tested, and installed in several of the EPG countries.



Figure 3: MLU improvements to the F-16. ¹⁷

United States Involvement

When the United States began its search for an aircraft with high thrust-to-weight ratio, low weight, and low cost, maintaining the low cost was a significant objective. This was a difficult task to meet if the acquisition community approached this undertaking as it had done previously. There was also a strong international initiative from many military and government officials to standardize the weapon systems in the North Atlantic Treaty Organization and increase industrial activity for the participants this new program. The standardization of a platform with a group of

international partners would offer opportunities for enhanced logistics support and an overall greater combat capability. In addition, this standardized practice would provide a foundation for common maintenance and training activities while increasing in the group's capability to develop common tactics and doctrine. Lastly, this normalization would reduce the program costs by removing duplicate development programs to evaluate of comparable systems and by sharing the overall production of increased quantities of any common item on the program.

The European Participating Governments, Belgium, Denmark, Norway, and the Netherlands, agreed to share the risks and support the development with the United States to produce the next Lightweight Multi-Role Fighter. Without the strong initial involvement of the United States, there were many political and economic obstacles in the other countries which would prevent the thought of a partaking in a new standardized weapons system. Many of the NATO countries who thought to join in this acquisition group would also be required to maintain elevated employment levels to develop an upgraded industrial platform, followed by the requirement to maintain significant stability in international trade. It was agreed among the initial four countries of the EPG and the United States that a solution for overcoming those problems is for each participating nation to share in the production of the F-16. It was also understood that the only way this agreement would succeed with participation from the four countries was if all four were fully committed. To encourage these four countries in the participation of the cooperative procurement of this Lightweight Multi-Role Fighter, the USAF established an enhanced source selection program with an accelerated schedule and a full-scale development decision to the maximum extent possible consistent with technical and cost risks involved. On January 13, 1975, the United States government selected the F-16 aircraft and awarded a full-scale development contract to the General Dynamics Corporation. Consensus for this agreement among the 5

countries was thought to only 90 days but ended up lasting over six months. It was not until June 1975 that Belgium, the final EPG country, agreed to the MOU, showing unanimous support to support the USAF in the acquisition of the F-16 aircraft, which also began the introductory contracts with the United States. During this process, the United States government had hoped a successful coproduction arrangement with the EPG nations would lead to future coproduction agreements in future acquisition programs.¹⁸

By choosing to follow the United States and pursue the acquisition of the F-16, the Netherlands, Belgium, Denmark, and Norway were conceding to fact they were not acquiring the Dassault Mirage F-1 or the Swedish Viggen. Other European countries left out of this agreement often argued that a European aircraft must be chosen and accused political and military officials of accepting substantial bribes. In the end, this agreement was considered the 'Deal of the Century', not only for the benefits provided to participating militaries but also to the businesses and industries which would reap the benefits of research and production.¹⁹

One of the major assumptions as these countries entered this agreement was that the United States would assume program responsibility rather than expect the EPG to deal with the contractor. In general, the MOU stated the basic production and assembly contracts equal to 58 percent of the value of the 348 European aircraft would be placed with the contractors based in Europe.²⁰ This would provide an added bonus of having the Europeans produce both their own aircraft and aircraft for the United States. The Europeans would also have the rare chance to participate in the production of third-country sales. Written into the MOU was also a guide which required the European contract costs to be reasonably competitive with the production costs of items in the United States. Because of this, cross-checks and controls established in this

agreement, a not-to-exceed unit production price goal of \$6.091 million was added into the MOU.²¹ Even though there was a significant amount of aircraft built in Europe, the MOU stated this program would still be treated as foreign military sale where all of the F-16s would be delivered by General Dynamics to the US Government which would then sell the contracted amounts to the EPG countries. As intricate and complex as this coproduction was to initiate and manage, the benefits were advantageous to all five nations.

Early in the planning and establishment of the F-16 program it was found that potential economic benefits existed for the United States by increasing exports, thus having a positive effect on trade balances, by strengthening aerospace product sales and providing increased domestic employment. It also aided in the United States and the EPG sharing of their common defense and research and development costs across the entire program.

The United States' original production requirement was to purchase 650 aircraft with plans to purchase up to 1,388 F-16's, while the agreed amount co-produced by the EPG countries was 348 total aircraft.²² This program did not contain any early plans for additional sales to third countries which would include, but not be limited to Iran, Israel, Spain, Turkey, and Greece. Since that initial acquisition, the USAF has purchased more than half of the 4500 F-16's built.²³

History of EPG and EPAF

While looking to replace their own aging and dated fighter aircraft, it was determined early in their own research that the EPG had objectives and requirements very similar to those of the United States. The EPG countries also required the acquisition of a low cost, easily maintained aircraft with advanced technology, avionics, and weapons capability. In addition, the four

European countries wished to procure an aircraft which was equal to the NATO standard while optimizing their own industrial, technical, and economic resources during the production and sustainment of the aircraft.²⁴

As an additional benefit, the EPG was anticipating this new alliance would help limit risks and strengthen the partnerships with its NATO alliances. As the USAF has generally had 70–75 percent of all operational F-16's within the MNFP, it has paid for 70–75 percent of the programs to modernize the fleet. While this reduced research and integration costs by 25 percent for the USAF, this MNFP agreement allowed for only a 6-10 percent share of the costs for the each remaining MNFP partners. Because of the tools the USAF already had at its disposal, the smaller EPAF countries did need to build or maintain the organizational infrastructure and technical competence and expertise required to test, evaluate, and certify the subsystems and weapons associated with these updates and enhancements. This arrangement has enabled the small EPAF partners to maintain a fleet of combat aircraft that are individually on par with those of the USAF at a price that is far less than it would have cost to merely maintain a baseline capability.²⁵

European Participating Governments

Several nations, including Belgium, Denmark, the Netherlands, and Norway, identified a clear requirement for a new fighter aircraft. At the same time, there was a need to meet the NATO standard which provided an incentive for a common aircraft among these air forces. The decision in June 1975 by the EPG, to purchase the F-16 air combat fighter created the F-16 multinational aircraft program. While the European governments purchasing the F-16s are known as the EPG, the air forces flying and maintaining the aircraft are part of the EPAF.

Specific circumstances existed during the development of the EPG program that provided for its success. The F-16 was developed by General Dynamic but called for co-production. The four European nations procuring the F-16 agree that they would benefit from procuring an aircraft developed in the United States but co-producing part of the aircraft in several European factories. This arrangement would allow for a new fighter without the costly development requirements, except for a pro rata share of the research and development cost for each aircraft, and to gain the benefits of greater production. It was stressed at multiple levels that, politically, production in Europe was indispensable to buying the aircraft. In turn, their procurement of an American fighter has large military and economic benefits for parties involved.

The Netherlands, Belgium, Norway, Denmark

These smaller MNFP countries were constricted with limited resources and situated in an area of the world which rendered their locations both valuable and difficult to defend. During the Cold War, Russia was already expanding its country's borders, combatting smaller countries who could not properly defend themselves. During this time, while the need for an advanced multi-role fighter was identified, these European countries were located along the Baltic and North Seas and situated in a vulnerable with few barriers of any kind to invasion from larger and more powerful Russia. ²⁶

The EPG was a strong influence which turned the Lightweight Fighter Program into a serious multi-faceted acquisition program. Because the four EPG countries, Belgium, Denmark, the Netherlands, and Norway, were good NATO allies of the U.S and looked to upgrade their F-104G fighter-bomber Starfighter interceptor, the option to acquire the F-16 made sound financial sense. ²⁷

Portugal

Portugal purchased their initial F-16's for their Air Force when they entered the Peace Atlantis I program with a Letter of Acceptance (LOA) in August 1990.²⁸ This LOA provided the initial 20 F-16 block 15 Operational Capability Upgrade aircraft (17 A's and 3 B's) with Pratt-Whitney engines and the initial logistic support which included parts for repair, support equipment, books, pilot and maintenance personnel instruction, and membership to support groups for the F-16.²⁹

During their initial 20 years with the F-16, Portugal witnessed the benefits of the consortium.

They saw the team support and lessons learned during conflicts, humanitarian and peace support operations. These experiences came during their contribution which supported allied operations.

The benefits were especially brought to light during operation ALLIED FORCE which showed the benefits of combat fleet modernization of the F-16 which would improve the aircraft's interoperability and raise commonality with these proven allies. In addition to their experiences in ALLIED FORCE, the Portuguese Air Force participated EXERCISE RED FLAG and witnessed the value of an upgrade to their F-16 fleet. They also observed the value of the advanced technologies, weapons delivery accuracy, and stand-off capabilities which reduced collateral damage, protected the MNFP aircrews while increasing airpower yield.^[2]

Portugal joined the MNFP, 9 June 2000, during a signing ceremony held at NATO Headquarters.

Portugal's intended fleet would include 45 F-16 aircraft.³⁰ Their primary purpose for joining this consortium was to expand its interoperability with NATO and take advantage of the benefits from the commonality amongst the MNFP community. Portugal's inclusion into the MNFP would offer additional benefits to its existing members. In addition to participating in the sustainment and modernization of their F-16's, Portugal benefited from the cooperative

agreement to purchase and stockpile precision-guided munitions, especially the Joint Stand-off Weapon and the Joint Direct Attack Munition made in the United States.³¹

MNFP's continued long-term development and sustainment of F-16 A/B aircraft, Portugal's membership will result in cost savings for all MNFP members. This was touted as one of the major points for allowing Portugal to join this exclusive team. Defense Secretary William S. Cohen stated. "We are extremely pleased to welcome Portugal into this special organization." said Cohen. "Portugal's accession into the MNFP benefits all MNFP members, and will facilitate Portugal's goal of attaining commonality and interoperability within NATO. The addition of the Portuguese Air Force strengthens the MNFP, and ultimately strengthens NATO."³² He added that "the U.S. sees this consortium of nations as an excellent opportunity to showcase the recently-announced defense licensing and export control reforms, which are meant to enable closer trans-Atlantic defense cooperation."³³

Working Relationship Between EPAF And MNFP

The MOU was the basic charter for the F-16 Multinational Fighter Program which prevailed over the preliminary contract and LOAs. The EPAF works and trains very closely with those in the USAF which are responsible for the operations, upgrades, and sustainment of the F-16 aircraft. To continue the strong working relationship between the MNFP countries, all of the EPAF countries have stationed officers at multiple program offices throughout the USAF in the United States.

IN-DEPTH ANALYSIS OF THE MNFP

The MNFP consortium celebrated its 40 anniversary, June 9th, 2015, in a ceremony at Beauvechain airbase in Belgium.³⁴ Representatives from the six participating countries celebrated the anniversary of the signing of a MOU as the base charter for the F-16 Multinational Fighter Program. This MOU has been the foundation for how the consortium makes decisions at any level and how the countries operate during all situations involving their F-16's.

How The Consortium Operates

The United States and EPG agreed to develop F-16 while keeping changes to a minimum. The structure and function of consortium's operations has been resistant to the ever present bureaucratic influence while maintaining its flexibility to make decisions beneficial to the entire team. This was made successful by following the MOU with every decision and understanding that all major MNFP decisions would be unanimous.

As the F-16 program progressed through the years, the MNFP partners jointly implemented follow-up modifications and enhancements to their F-16's. As the F-16 has entered its later stages in life, the consortium has identified feasible projects within the group's requirements that can counteract operational obsolescence.

Steering Committee

While drafting the MOU, the MNFP established the MNFP Steering Committee which would be responsible for all broad policy matters with the assumed responsibility to advice and counsel the Commander of the F-16 System Program Office. This Steering Committee was initially

comprised five members, with one member from each of the participating nations. Within these overarching responsibilities, the Steering Committee was tasked with monitoring the performance of all contractors associated with the development, production, and upgrades of the F-16 aircraft.

The Steering Committee was responsible for monitoring the performance of all contractors involved in the MNFP program. Each member of the Steering Committee was responsible for necessary consultation and coordination with the appropriate authorities of their respective country. The MOU specified the requirement that the members would have their respective Government's authority to enter into such arrangements, consistent with the MOU, as necessary. Issues resulting in substantial financial consequences for any Government, would require a unanimous vote from the Steering Committee. However, most issues were resolved by a simple majority vote of the committee. When matters arose, which only involved the EPG, the United States would only act as an advisory voice and the EPG would act as an advisory voice for issues regarding solely to the United States F-16 program. Early in the program, the Steering Committee determined that neither any United States nor European contractors nor subcontractors would benefit or incur losses financially due to fluctuations in the official rate of currency exchange.³⁵

The Steering Committee was scheduled to meet periodically but also hold additional meetings as necessary. All decisions from these meetings were required to be in writing. To help in facilitating communications through the program, the Steering Committee appointed a high-ranking European Officer. This officer was designated as the country's liaison officer and placed within the Aeronautical Systems Division at Wright Patterson Air Force Base.³⁶

Also in the MOU, the MNFP established Subcommittees which would oversee all Industrial Matters. The subcommittees were added to maintain the specific responsibilities for monitoring planned and actual co-production orders and other compensation orders to ensure compliance with the MOU regarding appropriateness of European subcontracting and to make appropriate recommendations for the resolution of any disputes.

EARLY F-35 PROGRAM

Since 2001, a total of nine nations have established an agreement to partake in the development of the Joint Strike Fighter, the F-35 (figure 4). In addition to the United States this included the United Kingdom, the Netherlands, Canada, Italy, Turkey, Australia, Denmark and Norway.³⁷ Of those nine countries involved in this development program, seven of them have announced their decision to acquire the Joint Strike Fighter. In 2007, these seven countries signed their own MOU agreeing with the continued support of development, production, and sustainment of the heavily watched F-35. Learning from F-16 MOU, the F-35 MOU recognized benefits from the international cooperation regarding standardization, rationalization, and interoperability of

military equipment and improving each country's mutual conventional defense capabilities through the application of emerging technologies.³⁸



Figure 4: F-35 Joint Strike Fighter participating countries.³⁹

Early in the drafting of the MOU, all of the participating countries recognized the benefits from agreements to cooperate in production, sustainment, and follow-on development of the F-35 (figure 4). Different from the F-16 MNFP, the F-35 Steering Committee recognized the countries had similar overall operational requirements, but each country had unique requirements. While not directly referring to the positive history of the F-16 MNFP program, the MOU requires the participating countries to share any lessons learned from current F-35 experiences or any previous program experience which would pertain to development of the JSF program. In the end, the MOU directly calls out the requirement to establish itself as a “model for international cooperative acquisition programs.”⁴⁰

Another similar component of this F-35 program is that it will negotiate joint contracts on behalf of all participating nations. This would mean the seven countries in this agreement will have no separate contract with Lockheed Martin or Pratt & Whitney for the purchase of their countries Joint Strike Fighter. These contract negotiations will be by the USAF program office which will aid in ensuring all seven participating countries are able to negotiate with industry as a single entity.

RECOMMENDATIONS

When the four European countries chose to follow the United States with the development and acquisition of their F-16 combat aircraft in 1975, they received significant and disproportionate benefits given the way that investments were made and managed. Purchasing these modern aircraft as a consortium with a common goal strengthened ties and increased their allegiance as a group. The benefits from this commitment included the deployment in multinational formations as a single group. It also allowed this collaboration to upgrade their country's aircraft at a significant cost savings over the last 40 years. The idea of a common aircraft also permitted many advantageous training opportunities for the MNFP pilots.

The initial order of 998 aircraft was made by the five original MNFP countries. This large scale purchase allowed for the much smaller countries to make a considerable investment which was only possible due to the "volume discount" on the aircraft price. This investment in their countries' defenses was only the beginning of the economic benefits which were empowered with the acquisition of an aircraft that maintained a common configuration shared among the multiple NATO allies.

While most of the NATO community has not been as dedicated to following the mantras of maintaining a standardized aircraft which is interoperable within this alliance, the common configuration of this multinational fighter across the fleet of MNFP F-16's has enabled multiple forms of cooperation and efficiencies stemming from this collaboration. To start with, maintaining a common aircraft opens the option for cooperative procurement of spare parts among this consortium. Next, this arrangement has developed a division of labor in maintenance between the members of the countries in the MNFP. Furthermore, the consortium agreed to share their experiences in operating and maintaining each country's portion of their fleet of F-16's. Maintaining this large record of data obtained from the sustainment of a significant population of F-16's performing in a variety of environments, has allowed the consortium to use these experiences to predict maintenance issues, analyze the effects of different use patterns, and therefore maintain a better fleet management which has extended the life expectancy of the multirole fighter as a whole. Lastly, the ability to maintain the common configurations among the MNFP partners has allowed the consortium to share spare parts and even munitions when necessary during times of training or combat. ⁴¹

Furthermore, the MNFP partners participated in the signing of their MOU which provided a long-standing relationship to produce, maintain, and modernize the F-16. This novel relationship provided improvements, life extension programs, structural enhancements, or other program updates to the entire MNFP fleet. It became quickly obvious that the much smaller fleets of F-16s procured individually by other nations through FMS programs outside of the MNFP were less likely to reap the same benefits and had to go without or make other arrangements. The MOU also provided details which supplied a representative on the steering committee which would "consider, evaluate and make decisions" regarding modifications and updates to the F-16

fleet. A major factor influencing the EPGs involvement in the MNFP was that the MOU provided each member of the steering committee an equal say in these decisions, thereby enabling smaller members of the consortium to potentially drive the aspects of the modernization of the MNFP F-16 fleet. The MLU, avionics modification program for the F-16 Block 15 A/B, was an excellent example of how the common requirements of the smaller EPG countries were able to influence the direction of the overall MNFP. Additionally, despite an equal voice in the consortium, the MOU also created the arrangement that the cost for all agreed upon updates and modifications would be paid on a pro rata basis by each of the MNFP countries. The idea would apportion the total costs for any common modernization programs based on the relative size of the country's fleet being modernized. Consequently, as the USAF has generally had three-fourths of all operational F-16's, it has paid for three-fourths of major baseline and specialized updates and programs. To the benefit of the EPAF countries, each have paid a much a much smaller portion equal to between 5-10 percent of the total cost. This agreement also removed the requirement from the smaller EPAF to build or maintain the technical competence and expertise in addition to the organizational infrastructure necessary to evaluate, test, and certify the systems associated with these modernizations. In the end, this pact has enabled all parties involved, no matter their size, to maintain a fleet of premier multi-role fighter at a price that is far less than it would have cost to merely maintain a baseline capability.⁴²

This aircraft and the overall successes of this program have shown the international significance of the F-16 as many countries around the world look to extend the life of their F-16's in lieu of pursuing more expensive options. These consortium countries should learn from these experiences and cooperate with this new group of allies in a comparable way to imitate the many positive results obtained over the last 40 years when these countries choose the next multi-role

fighter. The learning experiences from the actual F-16 aircraft are but one aspect of this large investment. Many other benefits were derived from the cooperation and teamwork created in this show of strong commitment to NATO and cooperation within this alliance.

CONCLUSION

This research asked the question: Based on over 40 years of evolution and success of the F-16 program, should the development, construction, and organization of the EPAF and the MNFP, be the international acquisition template for its replacement? This research confirms there were significant benefits to the creation of this unique teaming arrangement. Therefore, the conclusion of this report is that when each of the six individual countries purchased their F-16's for their fleet of multi-role fighters, this arrangement produced more than just a larger combined fleet of aircraft; these countries also strengthened their political bonds and global strength.

The purpose of this report has been to analyze the unique experiences and benefits offered from the procurement of the F-16. This report has shown that this alliance has created more than just an acquisition of aircraft. This 40-year alliance has created deeper ties with its alliance partners, that have provided very large dividends, and current consortium countries should attempt to imitate this experience when teaming and procuring future aircraft. This international partnership greatly reduced initial aircraft purchase price for all countries. This alliance also guaranteed that all aircraft associated with the MNFP consortium would be updated and modernized to maintain a common configuration equal to its partners. All the other international owners of the F-16 did not reap the same benefits and this meant a lot to the MNFP team. This common configuration has provided a unique type of fleet management across the USAF, the Belgian Air Force, the Royal Netherlands Air Force, the Danish Air Force, the Royal Norwegian Air Force, and the

Portuguese Air Force through the sharing of performance and maintenance data, a division of labor and specialization in maintenance, collaborative spare parts procurement, and the sharing of materiel when a nation has exhausted its stock. Furthermore, allowing the entire team to make decisions to update, modernize, or refurbish the F-16 was placed into a committee structure which gave a greater voice to the smaller team members that would not have had this same benefit in most other teaming arrangements. In addition, this was done using a cost-sharing mechanism which reflected the size of each country's fleet of F-16's. This mechanism was used to quickly modernize the MNFP fleet to continue precision strikes during coalition air campaigns. Beyond these technical and financial and benefits, the commonality of the aircraft permitted the MNFP countries to participate in live-fire exercises, such as Red Flag, and do so on terms that were favorable to each individual country.

Together, these experiences suggest a number of recommendations regarding the selection, development, and sustainment of future aircraft. The United States will benefit significantly in many areas from selecting an aircraft which is common across many users. Furthermore, the United States will benefit from this potential teaming with profits gained in the initial purchase, fleet management, maintenance, pilot training, equipping with munitions, and use during coalition operations.

This international partnership began with the development and international production of the F-16's. This team's objective has always been to maintain a program of cooperative development of long-term upgrades and sustainment of each nation's F-16 fleet. This supportive relationship has resulted in cost savings for all MNFP members and has helped to improve the affordability and continued superior performance of the F-16's through their lifecycle. The ability to train and sustain a common aircraft with these NATO allies helped to build and strengthen alliances.

Many NATO partners, including the Netherlands, Norway, and Denmark, are currently cooperating partners in the acquisition of the Next Multinational Multi-Role Fighter. These nine countries, and many more to follow, would do best to use the MNFP program as the international acquisition template to develop, test, procure, and sustain the possible replacement to the F-16.



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