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INTERNATIONAL COOPERATION: A CLASSIC EXAMPLE

A CASE STUDY

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INTERNATIONAL COOPERATION: A CLASSIC EXAMPLE

Introduction

A classic example of an internationally cooperative project and the first sponsored by the United States under the NATO Accord of 1966 [C-M (66) 33 Revised] is the NATO Sea Sparrow Missile System Project. The participating nations are Norway, Denmark, the Netherlands, Belgium, Italy, and the United States. This is one of the largest NATO-approved cooperative projects in terms of the number of nations participating although from a monetary stand-point it is not a large project. However, it embodies all of the elements and problems of any cooperative endeavor regardless of size.

The Sea Sparrow project is a multilateral, cooperative development program to produce a point-defense, anti-air missile weapon system. The project embodies a three-year development phase, a two-year directed production phase, and a one-year national production phase. Efforts are currently in progress to develop a follow-on support phase. The project will provide each participating nation with a production data package and a share in the production of a significant number of weapons systems.

It is not the purpose of this study to assess the military or strategic value of the NATO Sea Sparrow program, nor the military or technical efficiency of the equipment. Rather, this study is limited to a view of the success of the NATO Sea Sparrow Project as it pertains to international cooperation, to the problems encountered, and to the prospects for the future.

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BACKGROUND

At the meeting of the NATO Naval Armaments Group in December of 1966, the United States proposed the development of a lightweight, surface-to-air missile system for small warships. Such a system would utilize a modification of the existing U.S. Sparrow, air-to-air, missile. The system was to be known as the NATO Sea Sparrow Surface Missile System. The proposal was approved by the Naval Armaments Group and a Planning Group was established to implement the program.

Initially France, Italy, Norway, and the United States were represented on the Planning Group, which was chaired by the United States. Observers from Canada, the Federal Republic of Germany, the Netherlands, and an unofficial observer from Denmark attended sessions of the Planning Group.

In the early phases the Planning Group worked toward national approval of the threat, technical aspects, cost sharing formula, and management approach. Since Missile Systems Division, Bedford Plant of Raytheon Corporation was the development contractor for the Sparrow Missile, it was given early consideration as the prime contractor for the NATO Sea Sparrow.

At the January, 1968, meeting of the Planning Group, representation had diminished to Norway, Denmark, Italy and the United States. France attended but had announced her intention to withdraw. At this meeting there was virtually complete agreement on all facets of the program. The meeting concluded with the recommendation that the program proceed into funded development as soon as two or more nations had signed the Memorandum of Understanding. It was five months before this was to take place, primarily because of delays within the U.S. Department of Defense in obtaining approval of the Memorandum of Understanding. By July 1, 1968 the four initial countries had signed the Memorandum with subsequent entry of the Netherlands in May of 1970 and Belgium in 1971.

In the Spring of 1968 Raytheon representatives began to express doubts as to their ability to hold to the cost estimate specified in the draft of the Memorandum of Understanding. It became apparent that in Raytheon's desire to gain approval as the development prime contractor early estimates had been parroted back to the participants without the benefit of a cost analysis in depth. Fears were confirmed in October of 1968 when the Raytheon Contract Definition Report and Cost proposals were submitted. Both development and production cost estimates had risen by more than 40% over that contained in the signed Memorandum of Understanding.

An evaluation of the overall program was undertaken resulting in various modifications and the decision to open the program to a competitive approach. At a bidders' conference in March of 1969 eleven companies expressed interest in bidding as potential prime contractor. However, when bids were closed on June 2, 1969, only three companies remained in the competition - Frequency Engineering Labs Division of Harvard Industries, Equipment Systems Division, Wayland, Massachusetts, of the Raytheon Corporation, and Sperry Gyroscope Division of Sperry-Rand Corporation. After careful study of the proposals, the steering

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committee unanimously approved awarding of the prime contract to Equipment Division, Wayland, Massachusetts, of the Raytheon Corporation. Of interest is the fact that the difference between the highest bid under the competitive system and the initial contract development proposal was \$3 million, which indeed justified the confidence in the competitive process.

The development phase of the program calls for a production of three models of the system. One will be tested by the U.S. Navy and one will be delivered to Norway for tests while the third will remain with the prime contractor for systems evaluation. Upon completion of the development phase the program will enter a two-year, directed production phase followed by a one-year national production phase. During the directed production phase a complete data package will be delivered to each participating country.

MANAGEMENT AND CONTRACTUAL ARRANGEMENTS

Early in the planning phase it was agreed that overall control of the Sea Sparrow Project would be exercised by a Board of Directors known as the NATO Sea Sparrow Project Steering Committee, consisting of one member from each participating country. Votes were to be in proportion to development cost shares, and decisions were to be made by majority vote, with the exception that issues involving major changes to the program in the area of total costs, technical changes, and alterations of schedules required unanimous support. Unanimity was also required on nations desiring to join the project after the initial signing of the Memorandum of Understanding.

The working body of the Steering Committee is the NATO Sea Sparrow Project Office, located in Washington, D.C. The location was determined by proximity to the prime contractor and in order to utilize support available in the U.S. Naval Ordnance Command. The Project Office is headed by a United States Project Manager, assisted by a National Deputy from each participating country (with the exception that a single deputy represents both the Netherlands and Belgium). One of the National Deputies is designated as the Deputy Project Manager (the present Deputy is the Norwegian representative).

Thus the Steering Committee remains in close contact with the Project Office through their National Deputies. The Steering Committee meets quarterly and provides the link with NATO while remaining in constant contact with the prime contractor through the Project Office.

The prime contractor was required to work within the framework established by the Steering Committee and the Project Office. Although the first phase of the program concerned only development, the production phase was indeed influential since each participant's share of the developmental costs is in direct proportion to the number of systems each country procures or produces locally for its own use during the first three years of production. The cost sharing plan also makes allowances for other countries to join the program. The development sharing formula has undergone many fluctuations. In 1970 the United States reduced procurement intention by approximately 50%, Norway subsequently reduced procurement plans by approximately 35%, while Denmark has increased requirements, as has Italy. In addition, the Netherlands and Belgium have joined the program.

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An integral part of the understanding was that the balance of payments constraints must be met, and each country was to receive sub-contracts to meet within plus/minus 25% of each country's cost of development. By the time the contract definition phase was ready for signature, Raytheon had executed sub-contracts in each participating country. In Denmark the firm of Terma Elektronisk Industri contracted to produce radar microwave receivers, Italy's Selenia SPA contracted to make the firing consoles, and Norway's Kongsberg Vapenfabrikk contracted for development of radar pedestals and digital computers.

As Raytheon faces the very important production phase negotiation, there is the requirement to balance payments and adjust sub-contracts to account for shifts in requirements as well as awarding sub-contracts to two nations that presently do not have any. Not only must the Netherlands and Belgium be awarded sub-contracts on the basis of production participation but it must be tailored to include participation in the development phase.

EUROPEAN VIEWS

General attitudes in the member countries are not unlike those in the United States. Generally, the military is not popular particularly with the young, defense expenditures are extremely unpopular and there is little concern about the threat or perhaps a view that efforts and expenditures are not worthwhile in that they would have such a little impact. However, there is the element composed of military and those that remember World War II that is genuinely concerned about security and a strong NATO alliance.

As early as 1965 Norway realized the need for a surface-to-air, self defense capability and investigated a number of systems prior to selecting NATO Sea Sparrow. Norway's primary concern is to the north and defense efforts are oriented toward this end. With the addition of the Sparrow she will have an extremely well-armed frigate in that it has a Norwegian produced, surface-to-surface missile and wire-guided torpedoes as well as other conventional armament. One of these frigates is designated to evaluate one of the Sea Sparrow test models which will be delivered late this year. This evaluation will prove very valuable in the follow-on evaluation and improvement program.

Originally Norway entered the project with the intention of procuring eight missile systems but, due to the cutback in the shipbuilding and modernization program, this requirement was reduced to five. The Norwegian sub-contractor, Kongsberg Vapenfabrikk, also produces the surface-to-surface missile. For Sea Sparrow, KV produces radar pedestals and digital computers. The company has claimed proprietary rights on the computer, indicating that the computer will not be part of the data package available to each participating nation but must be negotiated separately.

Denmark shares a common interest with Norway in the area of defense and in the Sea Sparrow Missile project. Since the inception of the program, Danish efforts in the shipbuilding and modernization program have increased, dictating that the missile requirement be doubled. This surface-to-air, self-defense capability will enhance her ability to fulfill NATO responsibilities in contributing to the control of the Baltic Sea exits as well as defense of the Danish coast, Jutland, and Zealand.

Denmark shares Norway's concern about the balance of payments for the project and desires some meaningful portion of the production schedule. During the development phase the Danish sub-contractor, producing microwave receivers, has been Terma Elektronisk Industri. During this phase Terma was purchased by a Norwegian company and, since Danish law requires that production of military equipment must be controlled by a Danish company, a "paper" company was established. This may effect the sub-contractual production arrangements, particularly in view of the fact that Denmark will now command a larger portion of the balance of payments as a result of increased participation. However, there is no requirement that a sub-contractor produce the same components during the production phase of the program that he produced during the development phase.

Adding an air of uncertainty is a defense reorganization bill that is presently before the Danish Parliament. It is couched in general but sweeping terms and allows considerable leeway for change. However, it is highly unlikely that it will appreciably effect the Navy and the Sea Sparrow project.

Like Denmark, the Netherlands has also experienced a recent defense study and an investigation of the contribution to NATO, published as the Van Ryckevorsel Report. Action on this report has not been taken, but of importance is the fact that it will not have a detrimental effect on the Navy and the Sea Sparrow project and could even enhance the Navy's position.

The Dutch interest in defense extends throughout the North Atlantic and into the North Sea. In furthering those interests a most impressive ship-building program has been initiated creating the requirement for the Sea Sparrow Missile. At the inception of Sea Sparrow the Netherlands was interested, as indicated by their attendance at the initial planning group sessions, but there proved to be no requirement. Since then the requirement has appeared and they readily entered the program with the intent to purchase partial systems which excludes the fire control system. They presently have their own very fine fire control system.

Since the Netherlands entered the program in 1970 she has continued through the development phase without a balance of payments contract. Presently three companies are submitting bids (to the prime contractor) on supplying components during the production phase. As of this date there has been no selection and no designation of the components to be produced.

The Belgian Navy is oriented toward the English Channel and has been primarily engaged in mine sweeping operations. A recent decision to embark on an extensive ship-building program gave great impetus to the Navy and created the requirement for the Sea Sparrow Missile.

When Belgium entered the Sea Sparrow program last year (1971) it was with the intention of purchasing four partial systems in the same configuration as the Dutch to be placed on new destroyer-escorts. These DE's will be equipped with the Sea Sparrow, a French 100 mm gun, and a French torpedo.

Belgium, as a recent entrant, has not participated in the balance of payments portion of the program. However, negotiations are under way that will include the Belgians in the production of components for the Sea Sparrow.

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Italy, with NATO responsibility in the Central Mediterranean and concerns in the Adriatic, expressed early interest in the Sea Sparrow Missile and entered into the developmental program at the outset. Initially the Italian Navy indicated a requirement for one system but recently this requirement has been increased to two, based on a projected addition of two new frigates to the inventory by 1975. Since the Sparrow missile is presently produced in Italy, it could have been assumed that entry into the development program was for the purpose of obtaining the data package with the attendant capability to produce the modified Sparrow system in-country. The increase in requirements to two renders this concept no longer valid, although production at some future date is not ruled out.

The Italian Navy is highly sophisticated in missilery and presently employs the area defense systems of Tartan and Terrier. The Sea Sparrow will be a welcome addition and provide a well-rounded capability.

The sub-contractor for Italy is Selenia SPA., producing firing consoles, and is not unknown to the prime contractor since Raytheon formerly owned approximately 50% of the stock of this company. This former relationship has facilitated operations and there have been few problems in implementing this combined effort.

There is general agreement among the European participants that the Sea Sparrow project is a valuable program and they evidence general satisfaction with the progress of the program to date. There is confidence in the functioning of the Project Office and a desire to see this office remain in service after the production phase to assist in the highly important support phase. There is also equal support for the Steering Committee as the Board of Directors for the project. Quarterly meetings have been productive and beneficial in solving problems that have arisen with the project.

If a criticism of the project could be pin-pointed it would be that problems encountered have been the result of inadequate prior planning. There seems to be some consensus for the fact that this is a fine program but could have been better with detailed planning prior to execution.

PROBLEMS AND PROSPECTS

NATO Sea Sparrow has not been without problems, ranging from miniscule to monumental. An integral part of the project concerned modifications to the Sparrow air-to-air missile. The obvious initial modification was the development of a folded-wing missile capable of being stored in a launcher aboard ship. The second modification involved some discussion and concerned "readiness time" or "warm-up time". The Sparrow Missile as configured required a 30-second "warm-up" which the United States considered acceptable but the other participants charged was not acceptable in an environment where there were short distances in which to engage an aircraft. The result was concurrence on a modification to the missile reducing the "warm-up" period to 6 seconds.

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The project was dealt a serious blow when, in 1970, the United States announced a 50% reduction in its systems requirements. Justification for this reduction was not a cut-back in the defense budget but rather that the costs of the systems had been seriously underestimated. Reaction to this cut represented a wide spectrum of views from participants from the reaction that this increased costs of individual systems by 15%-20% to the reaction that results of the cut were negligible in that the total number of systems ordered remained sufficiently high on the cost curve so that little effect would be noticed. The most serious blow to the program was an erosion of confidence that appears to have been restored.

During the early sub-contracting phase, numerous difficulties were encountered not the least of which was the metric system. All components had to be made to U.S. specifications, which created many problems for the sub-contractors. Also great difficulty with drawings and blueprints was encountered, requiring various copies. These problems plus provisioning and parts list to U.S. standards led to a large cost overrun for the sub-contractor. In each case the prime contractor was required to provide technical help to resolve these problems which were indeed solved early and since that time there have been few difficulties in this area. Solving those problems has been a valuable exercise and should be profitable to future ventures.

Many other difficulties have been encountered with sub-contracting; undoubtedly the most difficult are yet to come as the production phase of the project comes up for negotiation. Although Raytheon has submitted a maximum ceiling price for the production phase and has received a maximum ceiling bid from the sub-contractors, there have been many changes since these bids were submitted. All participants have changed their requirements and two countries have entered the program without a balance of payments. There has been a devaluation of the dollar, and this has had a serious effect on the balance of payments. Most important, the prime contractor's share of the production has decreased from 90% to 60%. Indeed, it appears that the prime contractor has a strong justification for stating that these bids are no longer valid. The European view seems to be that once a contractor has committed himself to a price, that commitment must be honored and this view is widely held in the United States but there seems to be a great deal in mitigation. In addition, Raytheon will contend that none of the sub-contractors can meet the ceiling price which will undoubtedly be true in almost all cases. The cost overrun due to delays during the competitive bidding will be enough to make this true since inflation in labor costs in Europe is computed at 11%-14% per year while in the United States it is 5%-6%.

There are several alternatives available. Raytheon may submit a new ceiling price supported by a new ceiling price from each sub-contractor. If unacceptable, Raytheon or any of the sub-contractors could refuse to continue with relatively little risk. The participants could reject an increase and could resort to competitive bidding, but here there is the attendant loss of time and the most probable requirement for re-negotiation of all sub-contracts. If none of the sub-contractors are able to make the maximum ceiling price this would lend great credence to a presentation by the prime contractor for new negotiations. The least desirable alternative would be that Raytheon would contend that they could produce within the ceiling price but that the balance of payments would have to be set aside and the total system produced by the prime contractor. This would defeat the overall purpose of the program as it would become a straight purchase and this would be unacceptable to several, perhaps all, of the participants in the project.

The question arises as to whether one nation could produce the total system cheaper than the combine can produce it. In all probability it could be done for the simple reason that general accounting costs are very high for sub-contractors in addition to the fact that much of the material for production is purchased in another country at a higher price than that charged a domestic company. A possible solution is that the prime contractor could purchase required materials for the sub-contractors and ship them to him duty free. This procedure would greatly complicate the computation of balance of payments and raises the question as to present computations including those purchases made abroad that go into the components. In the final analysis, although perhaps a single contractor could produce the total system at a lower price, certainly six producers in the various member countries could not each produce the entire system at a lower cost. This demonstrates the true value of a cooperative venture.

Upon resolution of the production phase contract, the next hurdle is the support stage. This is a very important part of the overall project and is presently being discussed in each member nation. It involves a new Memorandum of Understanding, a continuation of the Steering Committee, and a continuation of the Project Office.

This concept would provide a cooperative sharing of the administrative and technical services provided by the Project Office, provide for direct payments for parts and repair services, and would apportion cost-sharing for follow-on product improvement. Execution of an agreement for the support phase will assure a long and close relationship among participants and will indeed be valuable to all concerned.

CONCLUSION

It is difficult to predict the outcome of the very important upcoming negotiations but it appears that the production contract will be concluded as planned albeit with some cost overrun. In order to preserve the cooperative aspects of the program a reasonable amount of cost overrun should be acceptable if adequately justified and documented to all participants.

The "national production phase" which is the term applied to the third year of production is not meaningfully defined and for the majority of the participants, if not all, will merely be an extension of the directed production phase. The possible exception is Italy where a decision could be made to produce the entire system. The value of the "national production phase" is that it lends flexibility to the program and affords options to the members as desired.

A very important and necessary part of the program is some form of cooperative agreement for the support phase which is to follow the production phase. During the support phase truly cooperative benefits could be reaped as each participant would have the opportunity to test, evaluate, and recommend improvements to the combine.

The Sea Sparrow Project is truly a classic example of International Cooperation, since it has encountered and is encountering all of the problems associated with a cooperative international venture, regardless of magnitude. Success of the project will indeed have a great impact on future cooperative ventures. Further, this project is indeed an extension of that part of the Nixon Doctrine which stresses cooperative efforts to improve individual defense capabilities.

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As one visits with those responsible for the NATO Sea Sparrow Project in the various countries involved in the program and with the contractors, a great deal of confidence is generated in the entire concept. It is obvious that there are top executives assigned to the project. There is a great deal of enthusiasm, a determination that the program will succeed, and a feeling of pride and satisfaction in the progress to date.

An obvious observation is that the experience and expertise gained from participation in the program should not be lost. By proper dissemination of the experience on the Steering Committee, with the Project Office, with the project in the various participating countries, and with the contractors the way will be paved for similar successful programs in the future.

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