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NATO STANDARDIZATION: POLITICAL, ECONOMIC, AND MILITARY ISSUES FOR CONGRESS

REPORT

TO THE

COMMITTEE ON INTERNATIONAL RELATIONS

HOUSE OF REPRESENTATIVES

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FOREWORD

HOUSE OF REPRESENTATIVES,
COMMITTEE ON INTERNATIONAL RELATIONS,
Washington, D.C., March 29, 1977.

This study was prepared by the Congressional Research Service at the request of the Committee on International Relations. The analysis was performed by Stanley R. Sloan, Analyst in European Affairs and Robert G. Bell, Analyst in National Defense, Foreign Affairs and National Defense Division.

The material contained herein is the work of the Foreign Affairs and National Defense Division, Congressional Research Service, Library of Congress and does not necessarily represent the views of the Committee on International Relations or of its members. While the study does not include a detailed discussion of every conceivable implication of standardization, it is presented here in an effort to promote discussion of the subject.

CLEMENT J. ZABLOCKI, *Chairman.*

LETTER OF TRANSMITTAL

THE LIBRARY OF CONGRESS,
CONGRESSIONAL RESEARCH SERVICE,
Washington, D.C., March 29, 1977.

Hon. CLEMENT J. ZABLOCKI,
Chairman, Committee on International Relations,
House of Representatives, Washington, D.C.

DEAR MR. CHAIRMAN: I am pleased to submit to you "NATO Standardization: Political, Economic, and Military Issues for Congress." In conformance with the committee's request, the study examines the relevant political, economic, and military issues of alliance standardization options for consideration by the Congress, with special emphasis placed on the implications of these issues for U.S. foreign policy.

This report was prepared by Stanley R. Sloan and Robert G. Bell, analysts in the Foreign Affairs and National Defense Division, Congressional Research Service.

We value the opportunity to treat this vital and difficult policy problem. I hope that our analysis will serve the needs of your committee and prove useful to others in Congress concerned with NATO standardization.

Sincerely,

GILBERT GUDE, *Director.*

ACKNOWLEDGMENTS

The authors would like to express their appreciation for the comments and suggestions of William Whitson, Stanley Heginbotham, Ellen Collier, James Wootten, and Ted Lampson, and for the production support provided by Kathy Hume.

During the preparation of this study, close contact was maintained with the General Accounting Office (GAO), which will be publishing its own study of NATO standardization in the near future. The comments and suggestions of GAO officers on an earlier draft of this study were particularly valuable.

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NATO STANDARDIZATION: POLITICAL, ECONOMIC, AND MILITARY ISSUES FOR CONGRESS

PRINCIPAL CONCLUSIONS

Standardization is a means to an end. The end is to sustain the ability of NATO forces to defend against a Warsaw Pact attack, and thus hopefully to deter such an attack, within the current and projected constraints on resources available for defense. In addition, even if pact capabilities were not improving, rationalizing the NATO defense effort would make sense in terms of eliminating waste, mitigating divisive competition among the Allies for arms sales, and strengthening political and economic relations between the United States, Canada, and Western Europe.

This study concludes that significant military and economic benefits are available to the alliance through judicious increases in standardization. The principal military advantages are streamlined logistics and improved tactical compatibility. Simplified logistics/support requirements enhance combat capabilities through improved response time for deploying forces and more combat versus support forces in the force mix. Improved tactical compatibility makes joint allied operations more effective—a potentially crucial factor in the NATO area. Standardization can also provide the rationale and impetus for closer coordination of doctrine and requirements.

The military benefits of standardization would be realized not only in time of war, but also as military improvements contribute to deterrence. Nevertheless, the assumption that standardization *alone* could improve NATO's combat effectiveness by 30–40 percent appears somewhat exaggerated because an increase in combat capabilities of this magnitude would be dependent both on complete tactical compatibility of forces engaged in joint operations and a total rationalization and integration of separate national logistics systems.

Tactical compatibility can be imposed "from above" by standardization, thereby improving combat effectiveness. If the weapons and equipment are the same, they will work together. A number of considerations, however, suggest that "total standardization" may not be a desirable objective. In cases where nonstandard systems are retained for military reasons, interoperability can provide an effective, though more expensive, means of insuring tactical compatibility.

Rationalization of logistics systems is much less susceptible to improvement through standardization. By greatly reducing the types of equipment which must be supported, standardization could lead to more streamlined logistics systems; however, standardization itself does not solve the problem of duplicative and overlapping lines of

logistics support. Even with standard or interoperable equipment, the 14 armed NATO states cannot optimize their collective war-fighting capabilities as long as each reserves the responsibility for logistics support to itself.

The potential economic advantages of standardization could include an elimination of duplicative research and development, more efficient economies of scale resulting from longer production runs, and the reduction of separate logistics systems. While cost savings are clearly available, analysts have disagreed as to the magnitude of savings that could be realized. It is evident, though, that actual cost savings may prove elusive until the standardization initiative progresses beyond ad hoc, halfway measures and addresses current redundancies at the macroeconomic level. As is true in terms of the military benefits, any approach to the problem which ignores the waste incurred through duplicative logistics systems cannot contribute significantly to achieving cost savings.

Policy Alternatives

If the Atlantic nations see their future security and economic well-being as inextricably linked in a relationship of increasing interdependence, it would make sense for them to create something like an Atlantic common market in defense technology, production, and procurement. Such a market could rationalize arms production in NATO countries by making use of the stimulus provided by competition in the market place but orienting that competition toward ultimate agreement on common weapons systems. Such a far-reaching, integrative approach would likely come closest to optimizing the military, economic, and political benefits of standardization. NATO forces would attain a high degree of commonality and interoperability; economies of scale would be realized and unnecessary overlap in research and development would be eliminated; interdependence of the Atlantic nations would be more effectively institutionalized; and a large and rationalized Atlantic market for weapons would reduce pressures for arms sales outside the Atlantic area. In sum, the Atlantic Alliance would be stronger in all respects and much less vulnerable to threats to their security from within or outside the Atlantic area.

While the picture portrayed above might be a desirable long-term aspiration for the future of the Atlantic Community, there is considerable doubt as to whether it is a practical objective for policy-makers today. Political consensus and economic integration do not appear to be sufficiently advanced within Europe or in the wider Atlantic area to permit acceptance of such a thoroughly cooperative approach in the near term. Nevertheless, the common and individual interests of all the Atlantic nations are poorly served by the current state of destandardization. In spite of the numerous obstacles and limitations, the United States and its Allies would benefit from judicious movement toward standardization, using whatever tools and methods of cooperation which are most effective and yet politically feasible.

Unless and until there is sufficient political consensus in Europe and between Europe and the United States to agree on innovative new cooperative structures, the NATO countries will have to depend on

tools and approaches which fall short of maximizing economic benefits while at the same time improving military capabilities.

Direct purchase of an ally's weapons system permits the purchasing state to avoid the R. & D. costs of developing a similar system and the expense of establishing a domestic production base. Production by a single manager can result in longer production runs, thus achieving a more efficient economy of scale, and it insures equipment standardization between buyer and seller. The limitations of this approach are negative balance of payments effects (unless offset by other military or nonmilitary trade), domestic employment losses, and the risks of relying on a foreign country for logistics support. Whether this approach will be applied more widely on a trans-Atlantic basis will depend on whether the governments can compensate for these drawbacks and upon their willingness to look beyond the individual project level and establish a broader framework that balances purchases with sales (the "two-way street").

Competitive R. & D. with licensed coproduction is the approach to standardization currently favored by the Defense Department. Legislation passed by Congress in 1976 endorsed this approach and expressed the sense of the Congress that coproduction would minimize the potential economic hardships of standardization (particularly the loss of domestic employment) and increase the survivability of the alliance's production base in time of war. The coproduction approach achieves most military advantages of equipment commonality. Nevertheless, if the competitive R. & D./coproduction approach is the preferred U.S. option for tackling standardization, then it is not realistic to estimate cost savings in the range of $10–$15 billion annually. Even were it assumed that the estimate is accurate, it is predicated upon a total elimination of all duplicative R. & D. and production and a complete rationalization of allied logistics. The coproduction approach does not purport to incorporate these reforms. In fact, the evidence indicates that coproduction may lead to higher costs and suboptimal economies of scale. These inefficiencies may, in turn, increase pressures for non-NATO exports.

Cooperative R. & D., with two or more states teaming up to design common equipment from scratch, is being employed extensively in current European joint ventures. However, this approach has been somewhat discredited in the United States by some bad experiences in the past most notably the abortive MBT–70 tank program. It might have a brighter future on a trans-Atlantic basis once there is a broader consensus on the need for standardization, closer harmonization of military requirements and doctrine, and greater integration of the European armaments industry.

Short of standardizing systems, there is a near-term requirement for making dissimilar systems *interoperable*. While interoperability can produce obvious military benefits, it may add to costs. If weapons systems are not standardized, the NATO countries will continually be struggling to make systems interoperable. Proponents of standardization see interoperability as a necessary intermediate measure, but not a long-term solution.

Realistically, no single approach to standardization will suffice; thus the NATO members should consider a variety of approaches, each

best suited to the particular case. *If* these approaches are to be combined successfully to produce progress toward Atlantic arms cooperation, a number of factors merit consideration. They include:

—The heads of government of the NATO countries would have to place a top priority on standardization. As history has recorded, rhetorical support is not sufficient. Support would have to be active, including, possibly, a special high level meeting to agree on principles for cooperation. The governments could also agree to designate a high level policy official in each of their defense ministries with *power* to monitor application of the principles. The governments could additionally agree to work toward collaboration on a major weapons area, such as the next generation of fighter aircraft.

—The parliaments of the NATO countries and the U.S. Congress would have to sustain their support for standardization. The parliaments can have a decisive influence, given their responsibilities for funding arms projects. A weakening of support for standardization in the U.S. Congress, in particular, could spell the end of the entire standardization initiative.

—The United States would probably have to be prepared to buy European weapons systems when they represent advanced technology and would improve NATO capabilities, even if such systems cost relatively more, at least in the short run, than their U.S. counterparts. The United States would also have to be willing to share advanced technology with the European Allies, particularly in areas where European specialization would be most promising. At the same time, the Europeans cannot expect the United States to take such an approach unless they move toward rationalization of their arms efforts in a framework of cooperation with the United States and Canada.

—The Government of France must participate if rationalization of European arms production is to become a reality. If the French do not cooperate, the other Europeans are left with the option of moving ahead without Paris, insofar as possible, in the hope that economic pressures will force the French to take a cooperative approach.

—American and European military leaders would have to work even harder to reach agreement on perceptions of the threat facing NATO and the tactics, weapons, and doctrine required to deal with that threat.

—American and European industrial leaders would have to attempt to learn more about each other's work techniques, trying to remove some of the technical obstacles to cooperation.

—A sustained Western economic recovery would create a more propitious atmosphere for acceptance of some of the short-term costs associated with the various approaches to standardization.

TERMINOLOGY

The focus of this study is on "standardization," but this subject can only be discussed in concert with two directly related subjects referred to in the NATO jargon as "rationalization" and "interoperability." The meaning and relationship of all three terms has been discussed in the congressional testimony of a State Department official.[1] Excerpts from his testimony serve as the definition of those terms for the purposes of this study:

> *Rationalization* is the "umbrella term" used to describe any action which makes more rational use of our defense resources both as individual nations and collectively. This includes a better and more efficient division of tasks or at least compatibility of equipment among allied forces. . . .
>
> We use *standardization* to cover the adoption of common equipment, doctrine, and procedures among various members of the Alliance. This is the most difficult element of rationalization to achieve, and the most misunderstood concept. Essentially standardization is a long-term undertaking. It starts with coordinated research and development, and a common perception of the future threat together with an agreed approach to how to deal with it. . . .
>
> The term *interoperability* is used to describe those steps taken to make different equipment more compatible. This includes interchangeable parts and consumables, such as fuel and ammunition, and the ability to cross-service between forces.

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[1] U.S. Congress. Senate. Committee on Armed Services, European Defense Cooperation, hearing, 94th Cong. 2d sess., Mar. 31, 1976, Washington, D.C., U.S. Government Printing Office, p. 36.

DEFINITION OF THE ISSUE

The 94th Congress, in both its first and second sessions, recorded its support of NATO standardization. U.S. policy in the Ford administration actively encouraged standardization. President Carter has said that NATO standardization will be a high priority of his administration. The European allies have also declared standardization as an important objective. But the appearance of a broadly based consensus is misleading. Behind this veil of support lie conflicting national interests, domestic priorities and pressures, different military requirements and, even among strong advocates, serious differences over how best to insure greater standardization.

There is, nonetheless, a general consensus on a set of assumptions that serves as a starting point for this discussion of standardization. In summary, it is generally accepted that:

—A secure, independent, and democratic Western Europe is central to U.S. political, economic, and military interests. It remains in the interests of West European countries to cooperate with the United States in insuring the security of all of Western Europe.

—The main external threat to West European security is the Soviet Union. Militarily, the threat consists specifically of Soviet and East European military forces allied in the Warsaw Pact Treaty Organization. The Soviet Union continues to improve the offensive capabilities of those forces.

—Nuclear parity between the United States and the Soviet Union has diminished the credibility of the Western tactical and strategic nuclear forces as a deterrent against a conventional Warsaw Pact attack on Western Europe. NATO's conventional ability to repel a Warsaw Pact attack has thus become increasingly important to the security of Western Europe.

—There are political and economic limitations on the resources available for improvements in NATO conventional capabilities.

Standardization, therefore, is a means to an end. The end is to sustain the ability of NATO forces to defend against a Warsaw Pact attack, and thus hopefully to deter such an attack. In addition, even if pact capabilities were not improving, rationalizing the NATO defense effort would make sense in terms of improved economic efficiency and strengthened political cohesion within the alliance.

The framework in which legislators and governments must address the standardization issue is multidimensional and extraordinarily complex. The decisionmaking process occurs on at least three levels: in the national political arena of each NATO country; within the European regional structures; and in the broad Atlantic/NATO context. The process involves not only governments at each of these levels, but also industrial decisionmakers. In addition, while the ra-

tionale for standardization is primarily military, the issue in its broadest aspect touches on many of the most important economic and political interests of the countries involved. At the heart of the standardization questions are economic considerations relating to national budgets, jobs, balance of payments, industrial organization, and technology transfers. And, it is in a highly charged political arena that decisions relating to this issue must be taken. Whether and how the NATO governments deal with standardization cannot help but have a profound impact on domestic, alliance, and international politics.

The central issue of this study is under what conditions and to what extent are NATO standardization programs likely to promote increased military effectiveness, greater economic efficiency, and closer political and economic ties among the NATO members. This study examines the history of past attempts to promote standardization in NATO, asking why such efforts failed. It looks at specific projects which have been touted as advancing standardization, trying to measure the gains that have been registered and recording some of the lessons learned. The study then examines some of the assumptions about the costs and benefits of standardization, asking whether it is possible to maximize military and economic benefits with any single approach to arms cooperation. Having examined some of the possible approaches, the study discusses some of the remaining obstacles to standardization programs and the political and economic circumstances which could have decisive impact on the future of standardization. The study concludes with observations about future prospects for standardization and suggests some actions that might be necessary if the NATO governments want to move toward greater standardization of their forces.

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GOOD INTENTIONS AND THE ROAD TO DESTANDARDIZATION

Standardization of NATO forces was a goal set in the first year of the alliance when in 1949 the signators of the North Atlantic Treaty created a Military Production and Supply Board to promote "coordinated production, standardization and technical research in the field of armaments." [1] This was a heady objective, set in the charged atmosphere of challenge to the Western nations from the Soviet Union and the spirit of rebuilding the West European nations in the framework of a politically, economically, and militarily united Europe. In NATO's first few years, there was a relatively high degree of standardization based on American and British war surplus equipment. In retrospect, effective standardization of NATO forces over the last quarter century might only have been maintained if the postwar vision of a united Europe in alliance with the United States had turned to reality. But, lacking a compelling military rationale for developing an integrated conventional defense, the United States and the West European Allies were unable to create the political, economic, and military framework that would have been required to rationalize the NATO defense effort.

Lack of a Compelling Military Rationale

The Korean war and the Soviet explosion of a nuclear device in 1949 convinced American planners that the West would have to intensify preparations to defend against a Soviet attack in Western Europe. The United States therefore moved to strengthen its military presence on the continent. On September 9, 1950, President Truman announced the assignment of four additional U.S. divisions to Europe and in December authorized General Eisenhower to serve as Supreme Allied Commander, Europe (SACEUR). On April 4, 1951, the Senate endorsed the President's decisions, but qualified its support in Resolution 99. Resolution 99 expressed the "sense of the Senate" that, among other things, the U.S. Joint Chiefs of Staff should certify that the European Allies were making a realistic effort on behalf of European defense; the European partners should make the major contribution to allied ground forces; and provisions should be made to utilize the military resources of Italy, West Germany, and Spain.

It was nonetheless recognized that the Europeans could not rapidly expand their conventional forces during the early stages of economic recovery and reconstruction. The security of Western Europe thus rested on the link that U.S. forces in Europe provided to the American nuclear force. The presumption was that while the Soviets had the conventional forces to attack Western Europe, they would not be

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[1] NATO Facts and Figures, Brussels, 1976, p. 27.

willing to engage American troops and risk use of the far-superior American nuclear capability. In these circumstances, there was no strong motivation to improve NATO's conventional capabilities, and therefore no compelling military rationale for standardization of NATO forces.

Lack of Political Will

United States accession to the North Atlantic Treaty was accompanied by the hope that European recovery and regional economic, political, and military organization would eventually provide the basis for a self-sufficient conventional military capability in alliance with the United States. In 1948, Belgium, France, Luxembourg, the Netherlands, and the United Kingdom had pledged in the Brussels Treaty to build up a common defense system and to strengthen their economic and cultural ties. This first cautious step, many hoped, would lead to some form of West European political entity. A Western Europe moving toward political and economic integration would also presumably integrate its defense efforts. The unified military force of a European defense community would have provided the rationale and procedures for cooperative research, development, and production of European weapons systems. This in itself would have guaranteed greater standardization among the European forces, and likely, between European and American forces.

In point of fact, Europe was not prepared to embark on such a daring political venture. Dreams of a unified West European military effort were dashed when the French National Assembly defeated the proposal for a European Defense Community (EDC) in 1954.

Following the defeat of the EDC, European and American statesmen worked quickly to patch together a framework which would at least provide the basis for German and Italian participation in the Western defense effort. In October 1954, the original parties to the Brussels Treaty invited Italy and the Federal Republic of Germany to join them in modifying the Brussels Treaty to create the Western European Union (WEU). The WEU protocols specified the conditions under which West German rearmament would take place and prepared the ground for West German accession to the North Atlantic Treaty in 1955. But the WEU was no European defense community and the WEU/NATO framework fell far short of an integrated Atlantic defense effort. As one expert has observed, just as the European political will was too weak to give NATO the structures necessary to promote standardization, "The refusal in NATO's earliest days to establish a NATO armaments and equipment procurement organization with common funding and a certain amount of autonomy * * * condemned the Alliance to an ad hoc series of arrangements that have failed to fulfill the reasonable expectations of the original signatories."[2]

In addition, although Europe progressed toward greater economic unity with the establishment of the European Economic Community (EEC) in 1957, the effort fell far short of the measures required to rationalize Europe's defense industries. The Treaty of Rome, establishing the EEC, provided the framework for freer movement of goods and services among the member countries. But the important

[2] Rhodes, Robert James. Defence, Technology, and the Western Alliance, "Standardization and Common Production of Weapons in NATO," Institute for Strategic Studies, London, 1967, p. 6.

area of government procurement was excluded from the treaty's purview. This meant that defense industries in the member countries would remain largely protected from free market forces that might have led to greater cooperation in and rationalization of European arms industries.

Proliferation of Arms Producers

In the absence of an effective framework for cooperation in arms production, the pressures for development of national arms production capabilities were decisive. In an insecure and unstable world, no nation that is able to do otherwise chooses to make vital aspects of its security totally dependent on other countries. This was the essential rationale behind the maintenance in the United States, and the reconstruction in Europe, of independent national production efforts. There were other pressures as well. To one degree or another, the United States and the European Allies were also motivated to support separate armaments efforts by: (1) differences in national perceptions of military requirements, deriving in part from contrasts in overseas military roles and commitments; (2) the desire to fortify a sense of national pride and prestige; (3) the pressures for maintaining domestic employment and obtaining foreign exchange earnings from foreign sales; and (4) the desire to gain influence, through the arms supply relationship, in countries outside the NATO area.

The United States in the early 1950's, was, of course, way out in front in the arms manufacturing business due to the fact that the U.S. industrial base had escaped unscathed by World War II and had received an additional stimulus from the Korean war production requirements. The British were also producing actively, and for the first few years of NATO there was a relatively high degree of standardization based on the corner that American and British manufacturers had on the market. But with economic recovery spreading across Europe, the French soon were back into broad scale arms development and production as were the Italians and Dutch (albeit on a somewhat smaller scale); and eventually the West Germans, within the limits established in the WEU agreements. The United States, in fact, actively supported the reconstruction of European arms production capabilities through Marshall plan assistance.

The situation in the mid-1950's, as described by one author, was one in which "nearly all the European members of the Alliance were producing some part of their defence equipment, although only Britain and France were producing aircraft on any scale. Co-operation was frequently advocated, largely for political reasons * * *, but it bore little practical result." [3] For the next 10 years, the Europeans continued to rebuild their armaments industries, and by 1965 these industries had become important elements of the political, economic, and military infrastructure of France, Great Britain, West Germany, Italy, the Netherlands, and Belgium.

Trying To Close the Barn Door

In 1957, the United States called attention to the growing diversity of weapons systems of the NATO countries. At a NATO summit in

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[3] Calmann, John. Defence, Technology and the Western Alliance. "European Co-operation in Defence Technology: The Political Aspect," International Institute for Strategic Studies, London, 1967, p. 3.

December, President Eisenhower offered America's technical knowledge and experience in arms production to assist joint European weapons production. In response to this initiative, the NATO heads of government recommended "closer co-ordination in the organization of forces to enable each NATO country to make the most effective contribution to the requirements of the Alliance." [4] They also agreed that "better use of the Alliance's resources and greater efficiency for its forces would be obtained through as high a degree of standardization and integration as possible." [5]

A number of new cooperative projects grew out of this initiative, but they were hardly sufficient to counter the trend toward further destandardization of NATO forces. In addition, when the United States talked about standardization the discussion inevitably led to a strong U.S. sales pitch for one of its weapons systems. This fact had already become a source of irritation for the Europeans. European suspicions of the U.S. unwillingness to purchase European weapons thus have their roots in this early period.

NATO, lacking the effective authority to integrate the allied armaments efforts, served largely as a clearinghouse for the weapons programs of the member countries and as a sometimes source of coordination. A variety of tools were developed in the early years to promote standardization through NATO bodies. One tool, employed through NATO's Military Agency for Standardization, was the Standardization Agreement (STANAG). The STANAG procedure registered limited success in encouraging some low-level standardization.[6] But many of the STANAG's were agreed but never fully implemented, and no major weapons system was ever standardized on the basis of a STANAG.

A second tool, adopted in 1959, was called the NATO Basic Military Requirement (NBMR). The NBMR procedure operated on the assumption that if the Allies were able to agree on a basic military requirement, that requirement would drive decisions about the weapons needed to meet the requirement. Of the approximately 50 NBMR's agreed, the Allies managed to meet or partially meet only 7—with equipment already available from one or more NATO members. But the remainder fell by the wayside and, perhaps most importantly, no NBMR ever resulted in the Allies agreeing to cooperate to produce equipment to meet the requirement. In other words, agreement on military requirements was a necessary but not necessarily sufficient condition for overcoming all the other obstacles to cooperation on arms production and procurement.

In 1966, the attempt to formulate alliance-wide consensus on weapons requirements through the NBMR approach was dropped in favor of a more permissive system which encouraged any country or group of countries to propose cooperative arms projects. If at least two countries expressed an interest, the project in question was studied, and if the interest continued, the countries involved asked for desig-

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[4] NATO Facts and Figures, op. cit., p. 41.

[5] Ibid.

[6] Some examples cited have been specifications for some types of explosives and ammunition, vehicle components and attachments, a list of electronic valves, impact tests for steels for guns, the adoption of a standard atmosphere for ballistic purposes, and rules for conversion of dimensions on drawings of United States origin for countries using the metric system.

nation of the undertaking as a NATO project. The new procedure was in itself an admission of failure. NATO authorities, looking for the bright side, subsequently observed that "The fact that there no longer had to be NATO-wide agreement on requirements helped to encourage proposals as it was realized that if only two countries cooperated to produce a weapon for their forces, this was better than nothing in the hope that one day all countries would agree to develop and produce completely standard items of equipment." [7]

The discouraging picture grew even darker in 1966 when France announced its withdrawal from participation in the NATO integrated command structure. The move did not preclude French participation in bilateral arms cooperation, but it did mean that whatever consensus was developed in NATO about strategy, military requirements, and weapons acquisitions, would not include this major continental power with its large defense industry. Thus, the French decision aggravated what was an already deteriorating standardization situation.

Ironically, as the outlook for standardization was becoming increasingly bleak, the military rationale was growing stronger. Soviet movement toward nuclear parity was severely undercutting the credibility of NATO's heavy dependence on nuclear deterrence. This fact pushed NATO toward adoption of the strategy of "flexible response" in 1967. Flexible response called for maintenance of allied capabilities on three levels, starting with effective conventional forces linked through tactical nuclear weapons to the strategic nuclear deterrent.

But even the adoption of a new strategy emphasizing the important role for conventional forces was insufficient to promote standardization. The West Europeans were still reluctant to accept the need for maintaining substantial conventional capabilities, particularly when détente with the East seemed in bloom. The United States, for its part, became entangled and preoccupied with the war in Vietnam. The war not only directed American attention away from Europe, but also focused American military requirements on Southeast Asia. In the U.S. Congress, the pressure was for reductions in U.S. troop levels in Europe, and the emphasis of the Johnson and Nixon administrations was on extracting balance-of-payments assistance and greater defense efforts from the European Allies.

The Fruits of Failure

The failure of NATO governments to give standardization a high priority led to an alliance of armies, navies, and air forces whose potential effectiveness is significantly limited by the great variety of weapons and associated support systems that make it difficult, and in some cases impossible, to communicate with and support each other. The limitations on the ability of NATO forces to fight together may seem regrettable in peacetime, but by all accounts they would be tragic if war came. Perhaps more importantly, the relative ability of NATO forces to fight together effectively could be a crucial element in discouraging a Warsaw Pact attack or in limiting Soviet political leverage. In a crisis, the Soviet perception of how stout a defense Warsaw Pact forces would have to overcome to achieve even

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[7] NATO Facts and Figures, op. cit., p. 141.

limited objectives would influence Moscow's judgments about what military *or political* gains they could achieve.

NATO's destandardization can be graphically illustrated in simple listings of the diverse weapons of allied forces. On NATO's central front, allied combat forces employ:

—23 different families of combat aircraft,
— 7 different families of main battle tanks,
— 8 different families of armored personnel carriers, and
—22 different families of antitank weapons.[8]

Even the Allied Mobile Force, a seven-nation combat group designed to be an integrated unit with quick-response capabilities, uses seven different types of combat aircraft, six different types of recoilless rifles, four different types of wire-guided antitank weapons, and three different types each of mortars, rifles, and machine guns.[9]

The military and financial "costs" of this diversity are discussed in detail in the section beginning on page 27. Let it suffice here to note that in going their own separate ways in building and supporting national forces, the United States and the Atlantic allies have spent vast amounts of money assembling forces which might fight well as independent national units but whose survival in a European war would be jeopardized by constraints on their ability to fight together.

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[8] Wall, Patrick. "NATO Must Standardize." Navy International, vol. 81, May 1976, p. 6.
[9] Tucker, Gardiner. "Towards Rationalizing Allied Weapons Production," the Atlantic Papers, October 1976, the Atlantic Institute for International Affairs, Paris, 1976, pp. 10–11.

A SECOND CHANCE?

In recent years, a number of factors have combined to enhance the prospects for standardization. First, with continued Soviet improvement of Warsaw Pact forces, the need to improve NATO's conventional force posture has become increasingly pressing. This has strengthened the military rationale for standardization. Secondly, the reorientation of U.S. security policy away from a demanding concentration on Indochina toward more attention to U.S. commitments in Europe has enhanced prospects for standardization. And thirdly, the Europeans have moved toward closer cooperation in arms manufacture.

U.S. Policy

The American disengagement from Southeast Asia removed a major hindrance to America's leadership role in the Atlantic Alliance and allowed American policymakers to focus attention on security interests in Western Europe. American forces in Europe, which had been undermanned and malequipped during the Vietnam war, began to profit from the new policy focus and the resultant availability of manpower and equipment for the European theater. The executive, particularly Secretaries of Defense Schlesinger and Rumsfeld, attempted to stimulate a new push for standardization.

Just as importantly, the U.S. Congress moved toward a new approach to the U.S. commitment to NATO which created an atmosphere more conducive to progress toward standardization. In 1975, Senator Mike Mansfield, the traditional leader of attempts to reduce U.S. forces in Europe, announced that he would mount no such drive in the wake of American setbacks in Southeast Asia. Improvement in the U.S. balance of payments also mitigated pressures for unilateral cuts in U.S. force levels. Congressional leadership on NATO issues gradually shifted toward those members who were impressed by the necessity of maintaining a conventional capability in Europe which was militarily effective and yet as cost efficient as possible.

While the actions of the Congress have not unequivocally supported standardization, that has been the major thrust of legislation in the mid-1970's. The first of a succession of standardization-related measures directed the Secretary of Defense, in 1974, to assess the costs of the lack of standardization, recommend corrective actions, and report semiannually to the Congress on progress toward standardization.[1] The Culver-Nunn amendment to the DOD Appropriations Authorization Act of 1975 (sec. 814(a), Public Law 94–106) made explicit the Congress' support for this objective:

> It is the sense of the Congress that equipment, procedures, ammunition, fuel, and other military impedimenta for land, air, and naval forces of the United States stationed in Europe under the terms of the North Atlantic Treaty should

[1] Public Law 93–365, sec. 302(c).

be standardized or made interoperable with that of other members of [NATO] to the maximum extent feasible.

The original language of this amendment, as contained in the Senate bill, had declared it to be "the policy of the United States" that equipment should be standardized or interoperable. This wording was amended in conference, for reasons detailed in the conference report:

The House conferees, although in agreement with the goal of standardization particularly in the areas of communications and other suitable equipment, expressed grave concerns that the import of this language as presently constituted could be misconstrued and possibly used to our disadvantage.[2]

Despite the House's qualified and ambiguous endorsement of standardization, two procurement decisions in 1975 presaged an improved climate for mutual cooperation. In January, the United States selected the French/German Roland as the winner in the multination Short Range Air Defense System (SHORAD) competition. European officials regarded the SHORAD competition as a crucial test of America's willingness to acquire a major weapons system developed in Europe. In June, the Netherlands, Norway, Denmark, and Belgium chose the F–16 as a common replacement for their aging F–104 Starfighters.

In 1976, a number of projects [3] undertaken in the name of standardization led to controversy over whether standardization could be reconciled with considerations of cost, quality, and availability. In spite of the skepticism of some Congressmen regarding the wisdom of an all-out commitment to standardization, the Senate pressed the initiative by proposing legislation to strengthen the U.S. commitment. The fiscal year 1977 Defense Appropriations Authorization bill passed by the Senate contained an amendment offered by Senator Culver that was almost identical to the amendment approved by the Senate, but weakened in conference, the previous year. The amendment declared it to be "the policy of the United States that equipment procured for [U.S. troops in NATO] should be standardized or at least interoperable" with equipment of other nations.[4]

The concern of some Senators over what appeared to be a developing trend toward quid pro quo weapons procurement agreements was expressed in an amendment to the bill offered by Senator Hathaway. As incorporated in the final act, the amendment required the Secretary of Defense to report to the Congress—

* * * the full details of the nature and substance of any and all agreements entered into by the United States with any other member or members of [NATO] providing for the acquisition of equipment manufactured outside the United States in exchange for, or as a part of, any other agreement by such member or members to acquire equipment manufactured in the United States.[5]

The House version of the authorization bill contained no comparable provisions related to NATO standardization, and in the committee of conference, the House conferees expressed their concern that "standardization should not become a means of bypassing prudent considerations in the procurement process." The conference committee agreed to add a qualifying sentence to section 802(a)(1) of the Sen-

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[2] U.S. Congress. House. Committee of Conference, DOD Appropriations Authorization for Fiscal Year 1976/T; conference report to accompany H.R. 6674, 94th Cong. 1st sess. (Rept. No. 94–488), Washington, D.C., U.S. Government Printing Office, 1975, p. 71.

[3] Such as Roland, the XM–1 tank, and the MAG–58 gun, discussed on pp. 22–26.

[4] Public Law 94–361, sec. 802(a)(1).

[5] U.S. Congress, House Committee of conference, DOD Appropriations Authorization for Fiscal Year 1977; conference report to accompany H.R. 12438, 94th Cong., 2d sess. (Rept. No. 94–1305), Washington, D.C., U.S. Government Printing Office, 1976, p. 53.

ate's bill, requiring the Secretary of Defense to "take into consideration the cost, functions, quality, and availability of the equipment to be procured" pursuant to the objective of NATO standardization.[6] With this addition, all of the Senate provisions were incorporated in the measure enacted into public law.

Thus, despite considerable controversy over some specific weapons decisions relating to standardization, U.S. support for NATO standardization emerged from the fiscal year 1977 authorization/appropriations process with the general backing of Congress. The debate in 1976 made it clear that if the Congress wishes, it can give higher priority to other objectives—such as avoiding reliance on foreign sources of arms—and thereby slow or prevent progress toward NATO standardization. But if the Congress wishes to promote standardization, it can only do so in concert with the efforts of European parliaments and governments. The development of the European side of the issue and European perceptions of U.S. intentions are thus directly related to the decisionmaking process in the U.S. Congress.

European Developments

THE EUROGROUP

In Europe, a new chance for NATO standardization has been promoted by the gradual evolution of a European caucus in NATO—the "Eurogroup." Its roots go back to 1968 when, following active encouragement from the United States, a number of European Allies[7] accepted British Secretary of Defence Healey's proposal to initiate informal discussions among their defense ministers concerning the European contribution to NATO. The initiative was set against the backdrop of the Soviet invasion of Czechoslovakia and the renewed British bid for membership in the European Community. But the most direct inspiration was the building pressure in the U.S. Congress for unilateral reductions in U.S. troop levels in Europe, The development of the Eurogroup over the succeeding years largely reflected this raison d'etre. As one author observed in 1974, the group's purpose was largely "to demonstrate the significance and magnitude of the European contribution to NATO and thus to counter arguments that NATO burdens are carried disproportionately by the United States and that Europe is insufficiently committed to its own defense."[8]

Following a rather low-key beginning, the work of the Eurogroup began to produce results in 1970, specifically in the form of a European defense improvement program which included added European contributions to NATO programs and new force improvements for a total package valued by the group at about $1 billion (1970 prices) over a 5-year period.[9] This package, however, represented the limits on new major undertakings that the European defense ministers thought feasible. Coming up against budgetary limitations of their own, they began to focus on ways to improve their defense efforts without large additional budgetary outlays. A number of subgroups were established

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[6] Public Law 94–361, sec. 802(a)(1).

[7] The British invitation was accepted by all the NATO European countries except France, Iceland, and Portugal.

[8] Cromwell, William C. The Eurogroup and NATO, Foreign Policy Research Institute, Philadelphia, 1974, p. 1.

[9] NATO Information Service, the Eurogroup, Brussels, 1976, p. 21.

in the early 1970's to study rationalization of the European efforts in communications, logistics, training, etc. The Eurogroup also established a subgroup of National Armaments Directors (EURONAD) whose initial purpose was to "draw up a set of principles to govern equipment collaboration aimed at reducing wasteful duplication and enhancing standardization and interoperability." [10]

A set of principles of equipment collaboration was adopted by the Eurogroup defense ministers in 1972, and pursuant to these principles the Eurogroup was used to coordinate or sponsor cooperation on the manufacture of the multirole combat aircraft (MRCA) and the FH–70 and SP–70 howitzers; joint purchase and support of the U.S. Lance missile; and replacement by four Eurogroup countries (Belgium, Denmark, the Netherlands, and Norway) of their aging F–104G aircraft with the U.S. F–16.

But the obvious flaw in the Eurogroup's effort was the absence of the French from the group. Paris, from the beginning, refused to take its seat in the group in the belief that Eurogroup membership would prejudice French independence from NATO's integrated command structure. The French had left the integrated command because Paris felt it institutionalized domination by the United States, and it was not about to submit to that "domination," even through the back door of the Eurogroup.

The other European Allies were generally agreed that more extensive European defense cooperation would eventually require French participation, particularly in the area of arms production and procurement. They declined, however, to let the French "dine *a la carte*" on the Eurogroup's platter by participating in the group's armaments efforts but not in the rest of the group's work. They hoped that if they were able to make progress toward selection of some common systems, the French would feel the pressure of possibly losing sales to the United States or to other European producers and would adopt a more cooperative approach.

The French did apparently feel pressured by the developing cooperation in the Eurogroup, although the pressure was not sufficient to overcome Gaullist objections to Eurogroup membership. In November 1973, French Foreign Minister Jobert, in a speech to the Western European Union Assembly, proposed that the Standing Armaments Committee of the WEU "provide the privileged framework for European cooperation in armaments manufacture." [11] This approach was never taken up by the Eurogroup members, who may have had suspicions about France's motives and, in any case, did not consider the WEU completely acceptable as a framework for future arms cooperation. Once Paris realized that the WEU was a nonstarter, and particularly after the French Mirage F–1E had lost out to the American F–16 in competition to find a replacement for the Belgian, Dutch, Danish, and Norwegian F–104 aircraft, the stage was set for compromise.

THE EUROPEAN PROGRAM GROUP

Late in 1975, the French accepted a proposal tendered by the Eurogroup members to form a new group, separate from all the European

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[10] NATO Information Service, op. cit., p. 28.
[11] Europe Documents Nos. 776/777, Atlantic Document No. 24. Brussels, Dec. 3, 1975, p. 11.

or Atlantic organizations, to work towards European armaments cooperation. In February 1976, representatives of France and the Eurogroup members met in Rome and agreed to form the independent "European Program Group (EPG)."

The first meeting of the EPG was, by all reports, harmonious and productive. It was reported that the countries agreed that the goals of the group included to: "(1) Bring about a more effective use of funds for the production of military equipment; (2) Increase the standardization and interoperability of military equipment with the aim of improving cooperation on use; (3) Strengthen the European factor in relation to North America; (4) Maintain a European defence industry as well as a valid technological base, in order to place Europe in a valid position with the United States." [12] The EPG members agreed on a work program focusing on the following tasks: "(a) harmonization of current defence equipment programmes and their dates of replacement; (b) search for medium- and long-term armaments of projects of common interest, whilst finding, if possible, the bases for beginning production of this equipment; (c) elimination of projects which are being developed in a parallel fashion by different countries * * *; (d) study the question of compensatory mechanisms." [13]

In April, these goals and tasks were organized into three subgroups. The first subgroup, chaired by the United Kingdom, was made responsible for "Harmonization of Timetables." By September, the group had already produced a detailed list of the defense equipment of the member countries, including replacement dates, the current stage of development of new equipment, possibilities for coproduction, et cetera. It was reported that "the list was so useful that the Arms Directors were swiftly able to identify certain specific sectors of military equipment which already lend themselves to detailed study" of their viability as cooperative projects.[14]

The second subgroup, chaired by Belgium, was established to study "Coordination of Programmes." Areas of equipment already under study by this subgroup include helicopters, medium-range antitank weapons, very low range ground to air missiles, light-weight vessels, fast patrol boats, and new types of mines. While the group believes that cooperation in these areas might be possible in the near-to-medium term, it also is studying some longer range prospects. These studies include future requirements for tactical aircraft replacement in the year 1985 to 1995 and munitions for a future combat tank.[15]

The third subgroup, chaired by West Germany, was assigned responsibility for "Defence, economies and procedures." It is this group's task to study the political and industrial aspects of arms cooperation. It has been reported that, according to EPG sources, the West Germans already have drafted "an excellent study concerning industrial cooperation, rationalization of the arms industries in Europe, the political principles of cooperation on European armaments, and the definition of the decision-making procedures" required for the EPG.[16]

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[12] Atlantic News. "Analysis of Decisions Taken by European Programme Group," Brussels, Feb. 6, 1976, p. 1.
[13] Ibid.
[14] Atlantic News. "EPG Concrete Progress Toward European Cooperation in the Arms Field," Brussels, Oct. 6, 1976, p. 1.
[15] Atlantic News. Oct. 6, 1976, p. 1.
[16] Ibid., p. 2.

The emergence of the EPG fundamentally altered the framework for discussion of standardization. Perhaps most important is the fact that *all* European members of NATO, including France and Greece which do not participate in NATO's integrated command, and Portugal which joined the EPG in the fall of 1976, are now active in the work of the EPG. Neither the European Community nor the Eurogroup include such comprehensive European participation. With European discussions of standardization now handled in the EPG, the Eurogroup will focus its work on other areas of cooperation. And for the time being, armaments experts in NATO have chosen to concentrate on promoting interoperability of NATO forces pending further development of the EPG.

The missing link in the current framework is how the EPG's work will be coordinated with the United States and Canada. Working back through NATO committees may not be acceptable to the French, and the linkage question thus consists of both technical and theological aspects. EPG discussions of this subject late in 1976 produced no solution. The November meeting of the EPG at the political level resulted merely in expression of the EPG countries' intent to begin discussions with North America in the near future and a requirement for the EPG National Armaments Directors to prepare a report early in 1977 on how to organize the trans-Atlantic dialog.[17]

Recent Cooperative Programs and Standardization

In the absence of an effective overall approach to arms cooperation among the NATO Allies, a number of cooperative projects have emerged in recent years which were designed to advance, or were subsequently attributed the virtue of advancing, NATO standardization. Of these, five programs illustrate the main approaches to arms cooperation that have been tried and also indicate the limitations of these approaches. These five programs are the multirole combat aircraft, the F–16 fighter aircraft, the Roland short-range air defense missile, the MAG–58 armor machinegun, and the United States/German main battle tank competition.

MULTIROLE COMBAT AIRCRAFT (MRCA)

One of the first tangible results of the new movement toward greater European defense cooperation was the decision by several NATO states to develop jointly an advanced tactical fighter for the mid-1970's. In a memorandum of understanding signed July 19, 1968, West Germany, Great Britain, Italy, and the Netherlands agreed to assimilate into a common design their individual fighter aircraft requirements for a replacement for aging F–104's, G91's, and other aircraft. Canada and Belgium were expected to participate, creating a market for at least 1,000 aircraft. Although Canada, Belgium, and the Netherlands withdrew from the project, MRCA became one of the largest European industrial programs ever undertaken.

The MRCA program began in earnest on May 14, 1969, when West Germany, Great Britain, and Italy agreed on a basic design and man-

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[17] Atlantic News. "Resume on the EPG After the Rome Session," Brussels, Nov. 26, 1976, p. 2.

agement plan for the aircraft. The agreement followed almost a year of difficult negotiations over the mission, cost, configuration, and division of responsibility for the MRCA. Unable to agree on whether the principal management responsibility for the project should be assigned to Germany or Britain, the three states decided to create a trinational consortium, Panavia Aircraft GmbH, to build the aircraft. Panavia is composed of three component corporations, British Aircraft Corp., Messerschmitt-Bolkow-Blohm, and Aeritalia.

In September 1969, the North Atlantic Council established the NATO MRCA Development and Production Management Organization (NAMMO) as an intergovernmental body responsible for setting policy for the MRCA project. In addition, the NATO Conference of National Armaments Directors designated the MRCA's a "NATO Project" promoting the objectives of improved standardization.

The first MRCA prototype flew on August 14, 1974, and on July 29, 1976, NAMMO and Panavia signed a contract to start production of the aircraft. When the MRCA is in full production, about 500 companies employing over 70,000 persons will be directly involved.[18] The procurement plan calls for a total of 809 MRCA's, including 385 for the Royal Air Force, 324 for the German air force and navy, and 100 for the Italian air force.[19] First delivery of an operational MRCA is scheduled for 1979. As now configured, the MRCA is a twin-engine, two-seat, swing-wing supersonic aircraft capable of performing a wide range of tactical missions. The British have elected to build 165 aircraft out of their allotment as an air defense variant of the basic ground attack design. The MRCA's unit cost is estimated to be between $9.6 and $10.2 million.[20]

Set against the many obstacles to cooperative development of a major weapons systems, the fact that the MRCA consortium eventually reached the production stage is a success in itself. But after the many delays and cost increases that plagued the MRCA throughout its development, acceptance of the aircraft by foreign buyers will be a crucial factor in the final determination of the financial success or failure of the venture. If foreign markets are not found for the aircraft, the MRCA will have been a very expensive experiment in cooperation for the three countries which stuck it through to the end.

F–16 FIGHTER AIRCRAFT

The June 1975 selection of the F–16 by the Governments of Norway, Belgium, the Netherlands, and Denmark as a common replacement for obsolescent F–104's and F–5's was widely hailed as a milestone for NATO standardization. The agreement by the four-nation European consortium and the United States to coproduce nearly 1,000 F–16's insures standardization between the five participating states in this mission category aircraft and, perhaps more importantly, precludes the destandardization which would have occurred had each state elected to go its own way.

The coproduction program's implications for a broader solution to the standardization problem (i.e., development of the "two-way

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[18] Aviation Week and Space Technology, Aug. 16, 1976, p. 49.
[19] Ibid.
[20] DMS Market Intelligence Report, Military Aircraft Highlights, November 1976, p. 3.

street") are nonetheless unclear. In selecting an American design, rather than one developed by France, Britain, or Sweden, the consortium placed its priority on cost and performance and rejected the contention that European armaments collaboration depended on choosing a "European" solution to this particular replacement requirement.

The F–16 agreement climaxed an intense arms sales competition begun in May 1973 when the four European states organized a steering committee to seek a common system for procurement. By the spring of 1975, the competition had narrowed to the F–16, the French Mirage F–1, and the Swedish Viggen. The F–16 was the winner of the U.S. lightweight fighter competition and thus held the advantage of a firm order by the U.S. Air Force for 650 aircraft. Sweden was severely handicapped in the competition by its status as a neutral nation. While the F–1 possessed all the performance and reliability characteristics associated with the distinguished family of Mirage aircraft, it was promoted chiefly by the French Government as a symbol of European unity in the face of U.S. arms sales domination. The French hinted that selection of the F–1 would be rewarded by new proposals for a total integration of the European aviation industry and a reintegration of the French military in NATO.[21] The Belgians in particular were torn between the apparent superiority of the F–16 and the "European" arguments for the French F–1.

On April 3, 1975 the Defense Ministers of the four states agreed that the F–16 possessed "undisputed advantages in operational qualities and program costs" over the other competitors.[22] In late May, Norway, Denmark, and the Netherlands signed preliminary contracts for the purchase of the F–16, and pressures intensified for the Belgian Government to make the final plunge. On June 7, 1975, the Belgian Government approved the F–16, influenced, it was alleged, by a last-minute U.S. commitment to purchase $30 million worth of Belgian machineguns.

In the wake of the defeat for the F–1, French Premier Jacques Chirac declared that the decision to purchase an American aircraft raised doubts about the four nations' desires to build a united Europe, and the president of the association of European aerospace industries described the choice as "a classic example of European political failure to promote our own industry."[23] Belgian Premier Tindemanns rejected these allegations, claiming that the F–1 "was not a truly European machine, having neither been jointly conceived nor jointly developed."[24] Other consortium officials noted that the French offered the F–1, with its 100 percent French design, rather than the cooperatively developed French/Anglo Jaguar fighter.[25]

The central question in the case of the F–16 is whether the experience will lead to even more extensive U.S. domination of the European aircraft market or will serve as an inspiration to the Europeans to develop competitive capabilities on a European scale. Reviewing the F–16 agreement, one Defense Department official stated, "We recognize that

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[21] Aviation Week and Space Technology, Mar. 24, 1975, p. 20.
[22] Ibid., Apr. 7, 1975, p. 15.
[23] Ibid., June 16, 1975, p. 17.
[24] Ibid.
[25] New York Times, July 27, 1975, p. 29.

the United States will not always win these international competitions," and endorsed the "two-way street" as "a necessary and practical means to improve force capability." [26] It is in this context that the Roland missile is most frequently cited.

ROLAND AIR DEFENSE MISSILE

In January 1975, the United States selected the French/German Roland 2 missile as the winner in the multination Short Range Air Defense System (SHORADS) competition. Proponents of standardization hailed the decision as demonstrable proof that America was willing to procure a major weapons system developed in Europe.

Although the Army's original intent had been to save time and money by procuring the best "off-the-shelf" SHORAD missile, it decided not to buy the Roland outright and instead elected to produce an American version of the missile in the United States under license. The basic design was changed to incorporate an upgraded target tracking radar, and the launcher had to be modified to permit mounting on an American vehicle. Although the United States and French/German missiles will have about 580 interchangeable components, almost none of these components are being purchased from European suppliers.[27] Instead, the Army has had to conduct an extensive and time-consuming search for U.S. suppliers for Roland subsystems. In addition, the Army's refusal initially to join in the European test program for Roland dictated that costly U.S. test equipment be designed and produced.

All of these changes have led to delays and severe cost escalation. Although the French and German Armies began receiving operational Roland missiles in 1976, the U.S. version will not be in service for a number of years. The total cost of reengineering the Roland for U.S. use is currently estimated at $256 million, $31 million more than the Army's original estimate.[28]

The future of this program remains uncertain. In 1976, the House Armed Services Committee set a $220 million ceiling for R. & D. costs involved in "Americanizing" the Roland. The committee action reflected its determination that the Army had not exercised "good judgment" in developing the Roland.[29] The committee also directed the Army to identify $3 million for the testing and evaluation of an American counterpart to the Roland, an all-weather version of the Chaparral missile. The fiscal year 1978 DOD budget request includes $67.1 million for the production of the first Roland missiles.[30] Should the Congress disapprove this proposal and reprogram the funds to the development of the Chaparral, it is likely that Europe's faith in the U.S. commitment to the "two-way street" would be seriously undermined.

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[26] McLucas, John L. The Air Combat Fighter: Progress for Standardization, NATO Review, No. 6 (December), 1975, p. 6.
[27] Aviation Week and Space Technology, Jan. 17, 1977, p. 59.
[28] Ibid., p. 57.
[29] U.S. Congress. House. Committee on Armed Services, DOD Appropriations Authorization for Fiscal Year 1977; report to accompany H.R. 12438, 94th Cong., 2d sess. (Rept. No. 94–967), Washington, D.C., U.S. Government Printing Office, 1976, p. 69.
[30] Program Acquisition Costs by Weapons System, Department of Defense Budget for Fiscal Year 1978, p. 32.

At issue in the case of the Roland is the basic rationale for licensed coproduction. The coproduction approach avoids adverse impact on the balance of payments and domestic employment, and it insures commonality with the U.S. logistics system. In the case of the Roland, the decision not to buy the French/German missile outright was influenced by additional considerations. Under Secretary of the Army Norman R. Augustine stated that the United States could not be dependent upon European spare parts for the Roland that might be cut off in time of war.[31] Additionally, he argued that the United States must possess a production base for the missile if it is to control sales to non-NATO states. In Secretary Augustine's words, "We wouldn't want to be in a position of having to get French or German permission if we wanted to sell the missile to, say, Israel." [32]

MAG–58 MACHINEGUN

The policy considerations which militated against direct foreign purchase of the Roland were not determinant in the case of the Belgian MAG–58 armor machinegun. Following extensive side-by-side tests, the Army on March 29, 1976, decided to purchase the MAG–58 in lieu of the Maine-built M60E2. Press reports suggested that the decision was linked to the Belgian decision to purchase the F–16, but the Defense Department insisted that the MAG–58 had been selected on the basis of superior reliability and performance. The unit cost of the MAG–58 was determined to be more than double that of the M60E2.[33]

In response to the Army decision, the Maine congressional delegation and the manufacturer filed a court suit seeking to block the foreign purchase. The plaintiffs claimed that the proposed procurement violated DOD regulations and the "Buy American" provisions of the U.S. Code. On July 1, 1976, the U.S. District Court for the District of Columbia issued a preliminary injunction enjoining the Army from awarding a contract to the Belgian manufacturer until 5 days after the GAO ruled on the merits of the protest.

While the GAO investigated the legality of the Army's decision, the Maine delegation sought to scuttle the agreement through legislative action. By a standing vote of 25–38, the House rejected an amendment offered by William Cohen (R-Maine) that would have deleted a $15.1 million appropriation in the fiscal year 1977 DOD Appropriations Act for "armor machinegun, 7.62 mm." In the Senate, the appropriation was not contested, due principally to explanatory language in the Senate Appropriations Committee report noting that "the recommended funds are not contemplated for any particular gun and are to be obligated pursuant to resolution of the dispute." [34]

On August 20, 1976, the GAO ruled that the proposed contract did not violate the "Buy American Act" or the procedural requirements of DOD procurement regulations.[35] As a result, the court lifted its

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[31] New York Times, Oct. 3, 1976, p. 1.
[32] Ibid.
[33] Selection of a Machinegun for Armored Vehicles. Report to the Congress by the Comptroller General of the United States (Rept. No. B–156500(5)), Mar. 23, 1976, p. 27.
[34] U.S. Congress, Senate Committee on Appropriations, DOD Appropriations for Fiscal Year 1977; report to accompany H.R. 14262, 94th Cong., 2d sess. (Rept. No. 94–1046), Washington, D.C., U.S. Government Printing Office, 1976, p. 180.
[35] Decision of the Comptroller General of the United States, Aug. 20, 1976 (File No. B–186276), p. 43.

injunction, and on January 14, 1977, the Army awarded a contract for the MAG–58. While it is currently planned that the first 10,000 MAG–58's will be manufactured in Belgium, the contract provides for the possibility of coproduction in the United States.[36]

In the case of the MAG–58, the decision to purchase a first-line armament manufactured abroad withstood the challenges of domestic political and economic interests and the liability of higher cost. Nonetheless, the U.S. procurement will have only a marginal impact on improved standardization, due principally to the wide proliferation of 7.62-mm machinegun types in NATO. Although the MAG–58 will become standard armament for the XM–1 tank and will be retrofitted on all U.S. M–60 tanks, the German Government will not equip the Leopard 2 with the Belgian gun.[37] The Germans contend that since their Leopard 1 tanks are armed with the German MG–3 machinegun, it would be destandardizing to equip the Leopard 2 with the MAG–58.

XM–1 TANK

While the four programs discussed above have had significant implications for NATO standardization, the XM–1/Leopard 2(AV) main battle tank competition may be a far more indicative measure of what is and is not possible in the current effort to improve standardization within the alliance. In this competition, the stakes were extremely high; the total market within NATO for main battle tank replacements in the coming decades is in the range of 10,000 tanks. In addition, since the tank remains the principle "prestige" weapon for ground combat, national political pride and military honor rest on the determination of which tank is superior.

The Defense Department had been scheduled to select either Chrysler or General Motors as the winner in its XM–1 competition in the summer of 1976. After further development, the winning prototype would be tested against the Leopard 2(AV). Defense officials pledged that the United States would choose the Leopard design, should it prove "clearly superior" to the XM–1.

In a surprise announcement on July 22, 1976, the Army deferred making a single source selection for up to 120 days. Both contractors were directed to redesign their prototypes in order to attain more commonality with the German tank. On August 4, 1976, in an addendum to the basic 1974 Memorandum of Understanding on Tank Development, the United States and Germany pledged to seek "standardization of items that dominate the logistics support of [their] tank forces, including fuel, ammunition, guns, tracks, engines, transmissions, and fire control."[38] The resolicitations directed the U.S. contractors to stress design changes in these areas.

The decision to delay the XM–1 program in order to attain greater commonality with the German tank provoked immediate criticism in Congress. Opponents of the plan expressed concern that the decision would result in cost increases, program delays, and degraded combat performance. On September 23, 1976, the House Armed Service Com-

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[36] Atlantic News, Jan. 19, 1977, p. 2.
[37] U.S. Congress. Senate. Committee on Armed Services, U.S. Army XM–1 Tank Program, 94th Cong., 2d sess., hearing, Washington, D.C., U.S. Government Printing Office, Aug 10, 27, and Sept. 14, 1976, pp. 51–52.
[38] News release, Office of the Assistant Secretary of Defense (Public Affairs), No. 349–76, Aug. 4, 1976.

mittee approved a resolution declaring that "the overriding objective of the XM–1 program must take precedence over secondary objectives such as standardization or interoperability of components." [39] The committee also cautioned the Secretary of Defense that congressional support of the program could be assured only if the revised program conformed with a number of guidelines, including that of choosing a U.S. XM–1 winner on the basis of "the primary objective" of the program, even if that choice violated the United States/German cooperative agreement.[40]

The XM–1 decision also concerned the committee of conference on the fiscal year 1977 DOD appropriations bill. The conference committee observed that the changes in the XM–1 program had been ordered after the House and Senate Appropriations Committees had completed their review of the budget and that "the proposed changes were a major departure from the XM–1 tank program justified to the Congress." [41] The conference report put the Defense Department on notice that fielding a main battle tank at the earliest possible date was a matter of special interest to the two Appropriations Committees and that funding for the revised development program would have to be subjected to the reprograming process. After subsequent discussions with Deputy Secretary of Defense Clements, the conferees decided that the Army would not be held to the reprograming requirement.

On November 12, 1976, the Army selected the revised Chrysler design as the winner of the XM–1 competition. The most significant aspect of the winning proposal was Chrysler's assurance that the unit production cost of the tank would be lower than its previous noninteroperable prototype and less than either the original or revised General Motors design. The promise of both interoperability and lower costs effectively disarmed critics. After meeting with DOD officials on November 15, 1976, the House Armed Services Committee concluded that the Chrysler selection conformed with the guidelines established by the committee in September.

On January 18, 1977, Army Secretary Martin R. Hoffman announced that the competition between the XM–1 and the Leopard had been canceled and that further comparative evaluations would be restricted to exploring possibilities for subsystem standardization.[42] Even before this announcement, it had been widely understood that the Defense Department's decision to delay the program in the name of improved commonality represented its assessment that this was the largest step toward standardization feasible at this time. In the case of the XM–1, then, the United States hedged its commitment to "winner-take-all" design competitions and chose the less difficult option of interoperability and project coordination.

IMPACT ON STANDARDIZATION

The five bilateral and multilateral programs discussed in this section evolved in an ad hoc fashion, and none has been correlated with

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[39] U.S. Congress. House. Committee on Armed Services, Report of the XM–1 Tank Panel (HASC No. 94–67), 94th Cong., 2d sess., Washington, D.C., U.S. Government Printing Office, Sept. 23, 1976, p. 17.

[40] Ibid.

[41] U.S. Congress, House, Committee of conference, DOD Appropriations, 1977; conference report to accompany H.R. 14262, 94th Cong., 2d sess. (Rept. No. 94–1475), Washington, D.C., U.S. Government Printing Office, 1976, p. 31.

[42] Washington Star, Jan. 19, 1977, p. 12.

a comprehensive pattern of NATO standardization. The programs represent the diversity of potential approaches to arms cooperation. The MRCA is a cooperative R. & D. coproduction project. The F–16 and Roland illustrate two different types of competitive R. & D. with licensed coproduction. The MAG–58 is a case of competitive R. & D. with direct purchase in lieu of coproduction. The XM–1 and Leopard 2 development programs, ostensibly cases of competitive R. & D. designed to lead to either direct purchase or licensed coproduction, are more examples of project coordination than of a "winner-take-all" competition.

These programs are but limited exceptions to the general rule of duplicative arms development and NATO destandardization. Participation in each project has been limited to only a few allies. As a consequence, the standardization effects have been similarly limited. In addition, gains from these projects are realized only slowly. Development and production of major weapons systems involve long lead times, and the process is even slower with more than one country involved. From the requirements definition stage to procurement, the F–16 will have taken more than 5 years, the MRCA more than a decade.

Collectively, the five programs provide limited gains for standardization. Even when the MRCA and F–16 reequipment programs are complete, the NATO air forces will be operating 18 basic types of fighter aircraft, 8 less than today.[43] The United States, German, British, and French Armies will each continue to operate a different type of main battle tank and the U.S. Roland missile system will be substantially different from that deployed by Germany and France. Moreover, the five programs are not themselves mutually consistent with the objective of standardization. For example, both the F–16 and the MRCA are essentially F–104 replacement programs and the respective American and West German decisions on machineguns for their tanks means destandardization of an important component of that weapons system. This is not to say that these programs have not generally advanced the cause of standardization. Besides serving the largely symbolic function of publicizing the possibilities for improved cooperation in armaments production, they have tested some of the alternative ways of attacking the problem, illustrating potential costs and benefits.

The summary lesson of these experiences may be that when the goal of standardization has conflicted with other interests—such as differing concepts of military requirements, contracts for domestic firms, and national pride—the compromises that have been made have tended to increase costs while increasing standardization incrementally. This is neither an indictment of standardization nor of the legitimacy of other considerations, but rather a commentary on a system that is inadequate for the purpose of making the economic and political tradeoffs necessary to fill the military inventories of many different countries with the same weapons.

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[43] International Defense Review, No. 4, August 1975.

ASSESSING COSTS AND BENEFITS

Introduction

Congressional support for NATO standardization is predicated on the belief that the current state of destandardization results in an enormous waste of Western resources, both military and economic. The Senate Armed Services Committee has estimated the *costs* of this waste to be:

—a 30–40 percent loss in combat effectiveness, and
—$10–$15 billion annually.[1]

These two estimates have been so widely repeated that they have achieved a certain currency as measures of the *benefits* possible through improved standardization.

This section assesses the validity of these two estimates. The following questions provide the frame of reference for this analysis: What is the basis for the estimates, and what are the assumptions upon which they are based? What level or degree of standardization would have to be reached to realize military or economic benefits of this magnitude? Are military and economic benefits dependent on attaining "total standardization," or is there an optimum point of selective standardization beyond which further standardization can be dysfunctional? Are efforts to promote the military objectives of standardization complementary with measures that promote economic objectives, or must progress in one category be achieved at the expense of the other? To what extent do the costs and benefits of standardization vary depending upon the approach chosen for dealing with the problem.

Military Factors

The principal military advantages of increased equipment standardization are streamlined logistics and improved tactical compatibility. Simplified logistics/support requirements bear a number of dividends that enhance combat capabilities:

IMPROVED DEPLOYMENT TIME FOR DEPLOYING FORCES

The Tucker study provides an excellent illustration of this point.[2] Tucker notes that the ACE Mobile Force (AMF), which consists of about 5,000 ground and air personnel, could well be the first integrated NATO force to deploy to a critical area in time of crisis. But the study observes that the seven different national forces participating in the AMF are equipped with seven different types of combat aircraft, six different types of recoilless rifles, four different types of wire-

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[1] U.S. Congress. Senate. Committee on Armed Services, DOD Appropriations Authorization for Fiscal Year 1977; report to accompany H.R. 12438, 94th Cong., 2d sess. (Rept. No. 94–878), Washington, D.C., U.S. Government Printing Office, 1976, p. 167.
[2] Tucker, op. cit., pp. 10–11.

guided antitank weapons, and three different types each of mortars, rifles, and machineguns. Because of the diversity of weapons types, the AMF is not standardized with the weapons of the host countries into which it would deploy and thus must carry full supplies from its staging base. In addition, because the AMF is not internally standardized, each of the seven nations must maintain separate logistics for its forces participating in the AMF.

What benefits would standardization bring? Tucker offers one assessment:

> The Commander of the AMF has determined that, if armaments were standardized both within his force and with the potential host country, then the time for his forces to deploy and be combat-ready could be cut to less than half of what it is today.[3]

The Callaghan study suggests that the AMF situation "is but a 5,000 man microcosm of the much larger problem affecting the readiness and military effectiveness of NATO's forces." [4] Noting that Secretary of Defense Schlesinger in his fiscal year 1975 annual report estimated that it would take an average of about 19 days per division to deploy to Europe, Callaghan asks, "What would be the impact * * * on deployment time * * * if we had a complementary European military-industrial base, producing, storing, and distributing [equipment] standardized for American and European forces?" [5]

MORE COMBAT VERSUS SUPPORT FORCES

Consolidated logistics systems would require less personnel, thus permitting an improvement in the "tooth-to-tail" ratio. The Tucker study observes that the AMF Commander has estimated that with standardization, "the seven logistics staffs could be consolidated and their tasks simplified so as to get the same job done with half of the logistic personnel." [6]

DECREASED TRANSPORTATION REQUIREMENTS

With a streamlined logistics system, there would be less material to move; accordingly, there would be a lower requirement for transportation equipment. Tucker suggests that with standardization, the airlift requirements of the AMF can be cut in half.[7]

Gen. Andrew J. Goodpaster, former Supreme Allied Comander Europe, observed in 1974 that NATO "was losing at least 30 percent and in some areas 50 percent of [its] capability due to the lack of standardization." [8] Although this estimate has become the basis for the commonly accepted measure of the net military benefits accruing from standardization, General Goodpaster has since explained that the estimate was worked out in terms of logistics support and constraints alone.[9] Based on his review of a number of exercises, and particularly the study on the AMF, General Goodpaster determined

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[3] Ibid., p. 11.
[4] Callaghan, Thomas A. U.S./European Economic Cooperation in Military and Civil Technology, Washington, D.C.: The Center for Strategic and International Studies, Georgetown University, March 1976, p. 34.
[5] Ibid.
[6] Tucker, op. cit., p. 11.
[7] Ibid.
[8] Rationalization/Standardization Within NATO. A Report to the U.S. Congress by the Secretary of Defense, Jan. 31, 1976, p. 53.
[9] Telephone conversation with General Goodpaster, Jan. 7, 1977.

that the maintenance of separate national lines of support reduced by 30–50 percent the support which could be provided to field forces, working against a fixed logistics capability.[10] In summary, while the Goodpaster estimate provides an excellent indication of the military benefits which could be achieved in the area of improved logistics, it does not purport to offer a more comprehensive gage of the overall balance between the advantages and disadvantages of total force standardization.

IMPROVED TACTICAL COMPATIBILITY

The second principal military advantage of greater equipment standardization is improved tactical compatibility. In brief, improved tactical compatibility means that the "interface" between different national forces conducting joint operations is smooth. While current interface problems are too numerous to list, the main defects are in four areas: tactical area communications, tactical aircraft rearming, tank gun ammunition, and fuels.[11]

Gardiner Tucker described one possible consequence of coordination failures during joint operations:

> The lack of common frequencies and codes for data transmission and of standard systems for identification of friend or foe, moreover, have been shown in recent exercises to lead to NATO destruction of NATO aircraft in a conflict. Of the substantial number of NATO maritime patrol aircraft which were (theoretically) shot down in one recent exercise, for example, subsequent analysis showed that more than 50% were attributable to NATO weapons.[12]

It should also be noted that standardization of major items of equipment can provide a rationale and impetus for closer coordination of doctrine and requirements. The Callaghan study declares that, "Progress toward cooperation in military systems will hasten agreement on requirements." [13] The study notes the case of the MRCA, in which "British defense officials were frank to admit that they never really tried to understand German requirements until told that the next aircraft would either be developed cooperatively with the Germans, or it wouldn't be developed at all." [14]

QUALIFICATIONS ON MILITARY BENEFITS OF STANDARDIZATION

When asked whether the U.S. standardization objective should be total or selective, Gen. George S. Brown, Chairman of the Joint Chiefs of Staff, replied, "Total standardization * * * does not appear to be a viable, or even a desirable, objective." [15] Despite the significant benefits available through standardization, a number of considerations suggest that the optimum degree of military effectiveness would be derived from something less than "total standardization":

—Different types of equipment may be better suited for different climates and geography. This consideration applies within

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[10] Ibid.
[11] LaBerge, Walter. Standardization and Interoperability, NATO Review, No. 6, December 1976, p. 14.
[12] Tucker, Gardiner L. Standardization and the Joint Defense, NATO Review, No. 1, January 1975, p. 12.
[13] Callaghan, op. cit., p. 21.
[14] Ibid., pp. 19–20.
[15] U.S. Congress. Senate. Committee on Armed Services, DOD Appropriations Authorization for Fiscal Year 1977, 94th Cong., 2d sess., hearings, pt. 1, Jan. 29, 1976, Washington, D.C., U.S. Government Printing Office, p. 561.

the NATO defense region and is further complicated by the U.S. policy requiring American forces in Europe to be available for global deployments.

—In some cases, a multiplicity of systems can complicate an enemy's planning problem. For example, a report prepared for the Defense Department in 1975 by R. W. Komer states, "Because of differing electronic signatures, an enemy would have much more difficulty jamming many uniquely produced radars rather than one design." [16]

—There are honest differences regarding the "most correct" military doctrine and concept of force employment. Major General Bowman, U.S. Air Force Director of European and NATO Affairs, has described one such disagreement:

> The British invented the tank. They see it as a moving pill box, very strongly armed. The Germans and to some extent the Americans, see it more like a cavalry troop. It has to move fast, and fire fast, and maneuver.[17]

Different types of equipment designed to meet differing tactical concepts provide a degree of redundancy should one particular doctrine be invalidated in time of war. The unexpected vulnerability of the German Stuka dive-bomber to counter-air during the first months of World War II is a classic example of the failure of a weapons concept in actual combat.

—If an important technological advance is made by one alliance member, but that state must defer incorporating the new technology into deployed hardware while a broader alliance agreement on standardization is negotiated, then an opportunity cost is incurred. The alliance must weigh the short-term benefits of a significant, though nonstandard, qualitative advance against the long-term costs of perpetuating a state of destandardization.

—In most cases, the equipment replacement schedules of individual NATO members are not synchronous. Many states retain older types of equipment long after newer models are introduced by others. Thus planners face the problem that standardization on the basis of the next generation of equipment may achieve less than standardization on the basis of the previous generation of equipment. The question of the desired gun for the main battle tanks of NATO armies illustrates this point. The German Leopard 2 is equipped with a 120-mm gun. If the XM–1 is armed with a 120-mm gun, it could eventually lead to increased standardization in Central Europe, but for a number of years it will result in decreased standardization within the U.S. Army as a whole and NATO, since almost all NATO main battle tanks are now equipped with 105-mm guns. Conversely, if the United States, Britain, and Germany agreed to equip their tanks with a 105-mm gun, there would be 97 percent standardization in NATO through 1995.[18] In this case the solution

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[16] Komer, R. W., et al. Rationalizing NATO's Defense Posture, Santa Monica: The RAND Corp., March 1975, p. 30. [Note: This document is classified Secret; however, its title and all quoted excerpts are unclassified.]

[17] U.S. Congress. Senate. Committee on Armed Services, European Defense Cooperation, op. cit., pp. 29–30.

[18] International Defense Review, June 1976, p. 989.

that optimizes combat performance conflicts with the solution that maximizes the degree of standardization.

—In the interest of standardization, states may agree to compromise varying requirements for specialized combat missions into a single multipurpose design. While this result will achieve a reduction in weapons types, it will leave the participating states with one weapon which cannot perform each mission as capably as a number of specialized systems.

Economic Factors

The principal economic advantages of increased standardization could be achieved through an elimination of duplicative research and development, more efficient economies of scale resulting from longer production runs, and the reduction of separate national logistics systems. The Callaghan study estimates the total waste of alliance resources in these three categories to be approximately $10 billion annually:[19]

[In billions of dollars]

General purpose force expenditures	United States	Europe	Estimated waste
Annual R. & D	5	2.6	[1] 2.6
Annual procurement	12	7	[2] 2.95
Annual support, Europe	([3])	([3])	[4] 5.65
Total	+17	+9.6	[5] 11.2

[1] Estimated at 100 percent of the European R. & D. expenditure.
[2] Estimated at 10 percent of the American procurement expenditure ($1,200,000,000) plus 25 percent of European procurement ($1,750,000,000).
[3] Unknown.
[4] Estimated at 10 percent of the $4,000,000,000 direct American annual NATO cost ($400,000,000) plus 15 percent of the $35,000,000,000 European general purpose force expenditures per year ($5,250,000,000).
[5] Rounded down to "more than $10,000,000,000" throughout this report.

This estimate forms the basis for the commonly accepted measure of the economic benefits possible through standardization.

As will be discussed in greater detail in the following sections, Callaghan's estimate is based on a number of assumptions that have been directly challenged by other economists and defense analysts. Nonetheless, Callaghan concludes that "with or without better data" it should be clear that improved NATO standardization would both enhance military effectiveness and permit the gradual reduction of defense expenditures.[20]

Pentagon analysts are far more conservative than Callaghan in estimating the possible cost savings available through NATO standardization. In fact, the second annual report to Congress on this subject states that "no precise formula has been found" to measure the economic costs of nonstandardization within NATO.[21] Although DOD surmises that "lack of standardization costs the Alliance several billion dollars each year," it declares that, "The greatest justification for standardization is military effectiveness * * *."[22]

[19] Callaghan, op. cit., p. 37.
[20] Ibid., p. 38.
[21] Rationalization/Standardization Within NATO, op. cit., p. 51.
[22] Ibid., pp. 51 and 53.

Tucker also concludes that current estimates are inadequate:

> Even though it has been the subject of extensive discussion and study for a number of years, there is nowhere a competent and discriminating assessment of the efficiency or inefficiency with which the forces of the Alliance are equipped or with which that equipment is developed, produced and maintained.[23]

Nevertheless, the Tucker study contends that improved rationalization of alliance weapons production would result in cost savings. This analysis concedes that a consolidation of duplicative R. & D. programs would require a more careful, and more costly, development effort since the security of the alliance might depend on the reliability and excellence of that single standardized system. However, Tucker maintains that:

> The greater cost of such a careful development should be more than offset in the aggregate by the reduction in the number of equivalent duplicative separate national developments. Moreover, the resultant system should be less expensive in production than the variety of separate equivalent systems which would be otherwise produced.[24]

While one of the cardinal objectives of standardization is to achieve significant cost savings by eliminating duplicative R. & D. and production capabilities, two considerations suggest that there may be limits beyond which further economies should not be pursued. These factors are the competitive effect and mobilization capacity of an essentially redundant industrial base.

To a large degree, cost effectiveness is a function of competition. Although too much redundancy in an industry can be excessive to that needed to insure competition, too little can fail to provide protection against what may be a greater economic evil—inefficient monopolies. If development and production become concentrated in one or two sources which subsequently turn out to be inefficient, eliminating duplication may have led to higher costs. The task for the advocates of standardization, Walter LaBerge has cautioned, is to strike the correct balance:

> As we try to improve the efficiency of free enterprise, we must be careful not to destroy the essence of this efficient, practical and so far successful system in favor of a theoretical system which has yet to be shown to be workable.[25]

One advantage of a duplicative production base is that it provides a "surge" capacity in time of war. While the individual elements of the industry do not in the aggregate constitute the most efficient economy of scale, they provide the basic infrastructure needed to expand industrial capabilities during a period of extended hostilities. A narrower production base can also be expanded, but it takes much longer, and this delay could be crucial to the course of the war. Again, planners must strive to define an advantageous balance. A recent study conducted for the Defense Department and OMB determined that the U.S. aircraft industry currently retains an excess capacity that costs DOD $400 million annually to sustain.[26] Without harming competition or surge capacity, the report estimated that eliminating duplicative production could result in savings of up to $240 million a year.

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[23] Tucker, Towards Rationalization . . . etc., op. cit., pp. 52–53.
[24] Ibid., p. 35.
[25] LaBerge, op. cit., pp. 14–15.
[26] The New York Times, Jan. 18, 1977, p. 41.

Military/Economic Tradeoffs

Arthur Smithies concludes that "Neither military or economic efficiency can be maximized as single objective." [27] A number of military/economic tradeoffs illustrate this point:

—If a highly dispersed, and hence more survivable, production base is one element of maximum military effectiveness, then the costs accruing from the most efficient economies of scale must be foregone. If, on the other hand, it is decided for economic reasons to concentrate production in the hands of the most efficient producer, and that source is located in a forward area that could be quickly overrun in time of war, then the military must face the possibility of losing a source for spare parts or replacement equipment—with its resultant degradation of military effectiveness.

—If a fiercely competitive R. & D. environment continually produces technological advances that permit the alliance to offset Soviet quantitative superiorities with qualitative advantages, but the number of competitive firms is significantly trimmed in the name of economy, then the alliance faces the possibility of a long-term decline in its technological superiority. While the resulting cost savings could be applied to greater numbers of less-advanced equipment, the question must be asked whether the alliance wants to engage the Warsaw Pact on the pact's own terms.

—Economic efficiency would be bought at the price of military effectiveness if, once standardization were achieved, it involved a freezing of designs and military techniques and hence inhibited adaptive responses to changes in the threat.[28] While there is always an economic disincentive for modernization within any government process, with or without standardization, the very difficulty of finally getting an alliance-wide agreement on deployed equipment could exacerbate this reluctance to upgrade weapons and equipment.

—The military benefits of standardization can only be achieved if existing nonstandard equipment is replaced. As Smithies notes, "If that equipment is still usable, an economic cost will be incurred if it is prematurely discarded." [29] Given the extremely long life-cycles of modern weaponry and the nonsynchronous equipment replacement schedules of individual alliance members, complete standardization would unavoidably incur such costs.

—Standardization may be politically attainable only through allowing the less efficient or technologically advanced members of the alliance to participate in the production of at least some systems or components. As has been demonstrated in the case of the F–16, this can lead to higher costs. The extent to which costs are increased depends upon the approach taken by the alliance to insure collective participation.

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[27] Smithies, Arthur, Standardization, Rationalization, and the Military Balance of Payments. Report prepared for the Secretary of Defense, Cambridge, Mass., Aug. 28, 1975, p. 3.

[28] Ibid.

[29] Ibid.

The Impact of Alternative Approaches on Military/Economic Tradeoffs

A study made under the auspices of the NATO Industrial Advisory Group illustrates how costs vary depending upon the approach to collective design and production chosen.[30] This study compared the theoretical costs of three different ways of providing four countries with a given quantity of missiles meeting an agreed set of operational requirements:

(*a*) Each country designs, develops, and produces its own share of the missiles;

(*b*) Competitive R. & D. between the four countries with coproduction of the best design apportioned equally between them; and

(*c*) Competitive R. & D. between the four designs with single-manager production by the most efficient supplier.

The results indicated that (*c*) provided the missiles at lowest cost, (*b*) added 25 percent to that cost, and (*a*) added another 25 percent. If, conversely, it is assumed that budgets are fixed, then (*b*) attains the military objective of standardization, but with 25 percent fewer missiles, and (*a*) achieves neither the military nor the economic objectives of standardization.

In noting this study, the Defense Department concludes that there is little justification for extrapolating the findings too broadly; nonetheless, it declares that the study "illustrates the importance of (1) some degree of limitation on parallel R. & D. programs and (2) learning how to be more efficient as production volume of identical components and systems increases." [31] The following sections develop this point in greater detail.

DIRECT PURCHASE

The Komer report determines that, "The optimum approach to achieving efficiency as well as economy entails one ally's specializing in the provision of certain equipment and in its life-cycle maintenance and support." [32] Direct purchase of an ally's weapons system permits the purchasing state to avoid the R. & D. costs of developing a similar system and the expense of establishing a domestic production base to manufacture the weapon. Production by a single manager results in longer production runs and thus achieves a more efficient economy of scale. Lastly, since the weapon is purchased outright, complete standardization is attained between the seller and the buyer.

While the Komer report concludes that there is little doubt that standardization via direct purchases makes sense economically in cases where the different countries' industries complement each other, it also asserts that it would make economic sense "even if U.S. industries were more efficient than the European industries on *all* defense products." [33] Komer assumes that European inefficiency relative to the Americans would be less on some products than on others, and hence the Europeans would be able to concentrate on the items which

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[30] Tucker, op. cit., p. 52.
[31] Rationalization/Standardization Within NATO, op. cit., p. 52.
[32] Komer, op. cit., p. 264.
[33] Ibid., p. 259.

they were least inefficient in producing. This concept is illustrated in the report by a hypothetical example based on the economic principle of comparative advantage:[34]

> The United States might produce both rifles and ships more cheaply than the Europeans, but the U.S. advantage over the Europeans in producing ships could be less than the U.S. advantage in producing rifles. Assume that:
>
> (*a*) U.S. industry can produce a rifle for $5, as compared to $10 for European rifles.
>
> (*b*) U.S. industry produces ships for $10, as compared to $12 for a European ship.
>
> (*c*) The United States purchases 20 U.S. rifles and 5 U.S. ships before standardization.
>
> (*d*) The Europeans purchase 10 European rifles and 3 European ships before standardization.
>
> (*e*) Under standardization, the United States offers the Europeans a package deal in which the United States would sell the Europeans all their rifles for $7 each and would buy all its ships from the Europeans for $11 each. If the Europeans would agree to this agreement, the United States would save $15 and the Europeans would save $25, as is illustrated in the table below:

United States:		
Before standardization:		
Total cost (20 rifles at $5 ea. plus 5 ships at $10 ea.)		$150
After standardization:		
Production cost (30 rifles at $5 ea.)	150	
International purchase cost (5 ships at $11 ea.)	55	
International sales cost (10 rifles at $7 ea.)	(70)	
Total cost		135
Total saving		15
Europe:		
Before standardization:		
Total cost (10 rifles at $10 ea. plus 3 ships at $12 ea.)		136
After standardization:		
Production cost (8 ships at $12 ea.)	96	
International purchase cost (10 rifles at $7 ea.)	70	
International sales cost (5 ships at $11 ea.)	(55)	
Total cost		111
Total saving		25

> Therefore, in this simple example, standardization would save the United States $15 and the Europeans $25. These savings could be used to fund other force improvements—together, they would be enough to produce two extra ships and almost four extra rifles.

The Defense Department recognizes that direct purchases of European equipment can be an advantageous approach to standardization. General Bowman has testified that:

> We must be willing to consider appropriate cost-effective procurements from our Allies. One such program was the purchase of Harrier aircraft from the UK. We are currently looking for other similar possibilities.[35]

The U.S. purchase of the Belgian MAG–58 is the most recent example of the Defense Department procuring a weapons system directly from an ally.

Despite the benefits of direct purchasing, three disadvantages have led to a very restricted use of this approach: (1) negative balance-of-

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[34] Komer, op. cit., pp. 259–260.
[35] U.S. Congress. Senate. Committee on Armed Services, European Defense Cooperation, op. cit., p. 29.

payments effects, (2) domestic employment losses, and (3) problems associated with relying exclusively on a foreign source for spare parts and logistics support.[36] The first two considerations apply in the narrow case of a single purchase, but some advocates of direct purchasing contend that on a macroeconomic scale, adverse effects on the balance of payments and domestic employment can be offset by European purchases of U.S. hardware. Others argue that it is not even necessary to achieve a balance within the military trade accounts, and that all that matters is the overall balance of payments.

The third consideration cannot be dismissed with economic score-keeping. A recent report by the GAO provides a case study of the problems associated with supporting weapons systems produced by other countries.[37] The GAO reviewed the U.S. Marine's experience with the Harrier aircraft, about 110 of which have been purchased directly from Britain since 1969. Because the Harrier buy was the first instance since the end of World War I in which the United States turned to an ally for procurement of a major weapons system, the success or failure of this program may have much wider consequences for the future of the "two-way street."

The GAO determined that although the Navy had established a minimum operational readiness objective of 60 percent for the Harrier, operational readiness levels during 1974 and 1975 ranged from 22 to 43 percent. The primary cause for the substandard availability was found to be inadequate logistics support planning for integrating the foreign system into the U.S. inventory and the absence of specific guidance and experience in acquiring and supporting a nondomestic weapons system. Other problems included the different maintenance and supply systems of the United States and United Kingdom, parts shortages—due in part to competition for parts between the Marines and the Royal Air Force—and difficulties involved in transferring technical data. The report notes that because of the inability to obtain necessary support from the British contractors, the Navy had to turn to a domestic firm for logistics support after only 6 months of Harrier operations.

Despite the magnitude of the difficulties found in this case, the GAO does not conclude that this approach should be abandoned. Rather, the GAO recommends a number of changes learned from the Harrier experiment which can reduce problems in future purchases of foreign systems. Callaghan recommends a similar positive approach, suggesting that, "The *degree* of reciprocal dependence of one ally upon the other must be seen not as an unyielding obstacle, but as a problem to be solved—by Europe and the United States." [38]

If the Defense Department's decision to buy the MAG–58 indicates that the United States is now prepared to consider a much broader utilization of the direct purchasing option, is a specific *mechanism* needed to insure a more equitable balance in United States/European arms sales? Callaghan calculated that during the 1960's the United States sold $8 billion worth of weapons and military equipment to

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[36] Benefits and Drawbacks of U.S. Participation in Military Cooperative Research and Development Programs with Allied Countries. Report to the Congress by the Comptroller General of the United States (Rept. No. B–167034), June 4, 1974, p. 30.

[37] Problems in Supporting Weapons Systems Produced by Other Countries. Report to the Congress by the Comptroller General of the United States (Rept. No. LCD–76–450), Jan. 4, 1977.

[38] Callaghan, op. cit., p. 89.

Europe and in return purchased only $700 million.[39] In order to establish a "two-way street" on the basis of parity in trans-Atlantic arms sales, Callaghan proposes that the United States:

> Offer to match every defense dollar Europe spent in the United States with a dollar spent in Europe.
> Offer to match the cost of every system developed in Europe for NATO use by an American defense development, also for joint use, and commit itself not to duplicate.[40]

The Defense Department contends that the Callaghan plan would be anticompetitive, and hence that it would lead to cost inefficiencies and a loss of qualitative superiority:

> The idea that we must create a system which ensures parity or the attainment of a predetermined target for procurement between each side of the Atlantic can only result in degraded combat effectiveness and economic inefficiency and therefore must be avoided.[41]

This OSD position reflects Arthur Smithies' conclusion that a commitment to matching expenditures "flies in the face of efficient allocation of resources." [42] Smithies explains:

> If considerations of efficiency require unbalanced trade, balance requires resort to inefficiency by one side or the other. Further, if efficient trade by both countries falls below the prescribed target, both countries must engage in inefficient production in order to reach the target.[43]

If a central allocation mechanism is not employed to insure balanced sales on the "two-way street," then the ratio of United States/European arms trade will be established by competitive factors. Under current conditions—particularly given an inefficient European production base—a free enterprise approach would likely perpetuate U.S. sales dominance. As a result, both the Defense Department and the Congress have espoused the concept of competitive R. & D. with licensed coproduction as the best means of retaining competitive advantages while providing for some measure of European industrial participation.

COMPETITIVE R. & D./LICENSED COPRODUCTION

In discussing possible elements of an alliance policy for standardization, the second annual DOD report on standardization recommends a three-step approach: (1) competitive R. & D. to satisfy common requirements, (2) common agreement on the best design, and (3) a commonly agreed approach to production.[44] The report notes that different production solutions are possible:

> The original designer could produce the entire system for the entire Alliance [direct purchase]. A more generally acceptable solution would be to license * * * a production capacity on both sides of the Atlantic.[45]

In 1976, Congress passed legislation codifying its endorsement of the latter solution:

> It is further the sense of the Congress that expanded inter-Allied procurement would be facilitated by greater reliance on licensing and coproduction agreements among signatories of the North Atlantic Treaty.[46]

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[39] Ibid., p. 44.
[40] Ibid., p. 111.
[41] OSD Memorandum, Subject: Basic Policy for NATO Weapon System Standardization, Nov. 8, 1975; cited in European Defense Co-operation, op. cit., p. 162.
[42] Smithies, op. cit., p. 11.
[43] Ibid.
[44] Rationalization/Standardization Within NATO, op. cit., pp. 53–54.
[45] Ibid., p. 54.
[46] Public Law 94–361, sec. 803(b).

Congress' support for this option was based upon its judgment that coproduction would minimize the potential economic hardship to participating states and increase the survivability of the alliance's production base in time of war by dispersing manufacturing facilities.[47]

This approach renders the military advantages of standardization by harmonizing the weapons systems of the coproducing states. From an economic viewpoint, coproduction represents a compromise between the higher costs of separate national R. & D. and production and the lower costs of joint procurement from single-source production. In the Tucker illustration (previously quoted), coproduction added 25 percent to the costs of procuring missiles for the four participating states. In the current case of the five-nation F–16 coproduction program, the projected cost for the 350 consortium aircraft is 18 percent more than what the aircraft would have cost had the participating countries brought the F–16's outright from the United States.[48]

In a study of U.S. coproduction programs with foreign countries, the GAO cited two other major disadvantages of this approach: (1) transfer of U.S. technology, creating the potential for future foreign competition, and (2) a U.S. labor employment loss if the alternative were direct foreign purchase of U.S. equipment.[49] The GAO listed a number of advantages of coproduction, including improved standardization, but it concluded that, "Whether coproduction and licensing arrangements are the most desirable means of achieving stated program objectives is largely a matter of value judgment." [50]

The Defense Department maintains that the advantages of this approach clearly outweigh the disadvantages. Although it concedes that coproduction "would result generally in somewhat higher costs than single-source production," it believes this drawback is outweighed by three advantages: (1) the spread of economic benefits throughout the alliance, (2) the transfer of technology, and (3) a more survivable production base.[51] Public Law 94–361 indicates that the Congress supports this determination.

The advantages of coproduction notwithstanding, four considerations should be kept in mind if the United States acts to put this policy into practice:

—If unit costs escalate too severely, fixed budgets will dictate that fewer systems be purchased, and hence there may be a net loss in military effectiveness, in spite of the military benefits gained through improved standardization.

—If each of the coproducing states elects to modify the basic design significantly to suit national purposes, many advantages of standardization will be lost.

—Unless the number of firms engaged in competitive R. & D. are trimmed significantly through greater specialization, there will be no economic benefit realized through an elimination of duplicative R. & D.

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[47] Ibid.
[48] Aviation Week and Space Technology, July 5, 1976, p. 17.
[49] Coproduction Programs and Licensing Arrangements in Foreign Countries. Report to the Committee on International Relations. House of Representatives, by the Comptroller General of the United States (Rept. No. ID–76–23), Dec. 2, 1975, p. 8.
[50] Ibid., p. 7.
[51] Rationalization/Standardization Within NATO, op. cit., p. 54.

—Unless economies of scale can be preserved through substantial exports to non-NATO states, an economic cost will be incurred. As Israel's pending request to coproduce the F–16 has demonstrated, boosting export sales may be complicated by the desire of U.S. non-NATO allies to coproduce, rather than purchase, weaponry.

COOPERATIVE R. & D.

The cooperative R. & D. approach to standardization entails two or more states teaming up to design common equipment from scratch. In a study of past cooperative R. & D. ventures between the United States and one or more allies, GAO concluded that:

> The future for international cooperative research and development appears much more promising for basic research and exploratory development programs than for engineering development programs.[52]

A number of factors contribute to the finding that cooperative R. & D. does not provide an optimum basis for attacking the destandardization problem:

(*a*) While joint R. & D. may offset one nation's development costs somewhat, it increases the overall cost of development on an alliance basis and greatly extends the lead time required for bringing weapons systems to the operational hardware stage. One German defense industrialist has proposed the following formulas for calculating the additional cost and time of multilateral projects:

> The costs were a function of the square root of the number of participants, and the time required depended on the cube root of that number. Thus bilateral programs implied 40 percent higher costs, and trilateral ones as much as 73 percent higher. The times required increased by 26 percent and 45 percent respectively.[53]

(*b*) Each participating state must make compromises in its individual military requirements in order to reach common agreement on a single R. & D. design.[54] Perhaps the best example of past failure in this regard was the abortive United States/German MBT–70 program.

(*c*) Two or three may be the optimum number of states which can effectively join together in a development effort. The Tucker study established that the average number of states participating in NATO cooperative development projects has been 3.6.[55] Nevertheless, it makes a significant difference who those participating states are. Komer determined that 91 percent of NATO outlays on major military equipment in 1973 (excluding France) came from the United States, Germany, and Britain; with France included, the four states accounted for 95 percent of the expenditures.[56] This suggests that while the participation of other allies is politically important, standardization depends essentially on the cooperation of the United States, West Germany, France, and Great Britain.

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[52] GAO Report B–167034, op. cit., p. 3.
[53] Simmons, Henry T. NATO Equipment Standardization—The German View, International Defense Review (April 1976), August 1976, p. 564.
[54] GAO Report B–167034, op. cit., p. 21.
[55] Tucker, Toward Rationalizing Allied Weapons Production, op. cit., p. 10.
[56] Komer, op. cit., p. 244.

(*d*) Even if agreement could be reached on one development project, disparity in scale makes it impossible to structure major bilateral development projects with individual European states; that is, European industrial capacity does not presently extend beyond the ability to work a single major project at a time.[57] Bilateralism on the basis of a United States/European approach offers more promise; however, Callaghan points out that individual firms are saying, "First create the markets, and then we'll merge"; while governments are saying, "merge first, and then we'll create the markets." [58]

INTEROPERABILITY

Interoperability is not so much an approach to standardization as a supplement and/or alternative to it. The Defense Department has indicated that:

> NATO efforts are being concentrated on interoperability because a number of the European Allies wished to defer NATO debate on the more general (and more difficult) subject of standardization pending the outcome of their own effort in the EPG to organize the European side of the standardization equation.[59]

Basically, the distinction between standardization and interoperability is that where standardization focuses on efforts to make future weapons and equipment similar, interoperability seeks to make dissimilar weapons or equipment compatible.

The second annual DOD report on standardization indicates that the priority areas for improved interoperability are communications, ammunition, air munitions delivery systems, aircraft cross-servicing, and fuels.[60] The Komer report provides one estimate of the military benefits possible through improved interoperability:

> If all NATO surface ships could be replenished with one type of oiler and one type of fuel, if all NATO tactical aircraft could be serviced at any airfield with the same fuel, ammunition, and repair parts, and if all NATO tanks could be re-serviced with the same fuel, ammunition, tracks, and batteries, the military effectiveness of NATO might increase by at least 40 percent.[61]

While interoperability can lead to obvious military benefits, it does not necessarily produce cost savings. In some cases, adaptors, converter kits, interchangeable parts of components, and dual- or tri-capable subunits may actually add to equipment costs. Interoperability does not reduce waste associated with redundant R. & D. or diseconomies of scale, nor does it address the inefficiency of maintaining separate national logistics/support systems.

SUMMARY

Significant military and economic benefits are available to the alliance through judiciously improving standardization. The military advantages would be realized not only in time of war, but also as military improvements contribute to deterrence. Nevertheless, the

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[57] Callaghan, op. cit., p. 73.
[58] Ibid., p. 76. (See p. 47 for further discussion of this point.)
[59] U.S. Congress. Senate Committee on Armed Services, European Defense Cooperation, etc., op. cit., p. 155.
[60] Rationalization/Standardization Within NATO, op. cit., p. 9.
[61] Komer, op. cit., p. 258.

assumption that standardization *alone* can improve NATO's combat effectiveness by 30–40 percent appears to be exaggerated. An increase in combat capabilities of this magnitude would be dependent both on complete tactical compatibility of forces engaged in joint operations and a total rationalization and integration of separate national logistics systems.

Tactical compatibility can be imposed "from above" by standardization, thereby improving combat effectiveness. If the weapons and equipment are the same, they will work together. A number of considerations, however, suggest that "total standardization" may not be a desirable objective. In cases where nonstandard systems are retained for military reasons, interoperability can provide an effective, though more expensive, means of insuring tactical compatibility.

Rationalization of logistics systems is much less susceptible to improvement through standardization. By greatly reducing the types of equipment which must be supported, standardization could lead to a more streamlined logistics system; however, standardization itself does not solve the problem of duplicative and overlapping lines of logistics support. Even with standard or interoperable equipment, the 14 armed NATO states cannot optimize their collective warfighting capabilities as long as they rserve the responsibility for logistics support to themselves. As a recent report on NATO by Senators Nunn and Bartlett concludes, "Ultimately * * * progress will require discarding the notion that logistics should be exclusively a national responsibility." [62] It should be noted, though, that standardization provides an incentive for this reform. If all NATO forces were equipped with the same weapons, the argument that unique weapons requires national, rather than alliance, logistics support would be greatly weakened.

Until the standardization initiative progresses beyond half-way measures and redresses current redundancies in R. & D. and production at the macroeconomic level, actual cost savings may prove elusive. As is true in terms of military benefits, any approach to the problem of standardization which ignores the waste incurred through duplicative logistics systems cannot contribute significantly to achieving substantial cost savings.

The costs and benefits of standardization vary according to the approach taken toward reducing the state of destandardization. Measures which emphasize either the military or the economic objective may do so at the expense of the other. Realistically, no single approach will probably suffice; thus the alliance might consider adopting a variety of approaches, each best suited to the particular case.

If the competitive R. & D./licensed coproduction approach is the *preferred* U.S. option for tackling this problem, then it is not realistic to estimate cost savings in the range of $10–$15 billion annually. Even if it is assumed that this estimate is accurate, it is predicated on a total elimination of all duplicative R. & D., single-manager production, and a complete rationalization of alliance logistics. The coproduction approach does not purport to incorporate any of these reforms. In fact, the evidence indicates that coproduction may lead to higher costs,

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[62] U.S. Congress. Senate. Commitee on Armed Services. NATO and the New Soviet Threat: Report of Senator Sam Nunn and Senator Dewey F. Bartlett, 95th Cong., 1st sess., Washington, D.C., U.S. Government Printing Office, Jan. 24, 1977, p. 20.

particularly in the early stages, and can achieve cost savings only if economies of scale are improved through non-NATO arms exports.

The Tucker study states that "the assertions and examples regarding the importance of allied-wide standardization and the reduction in allied conventional defensive capability which result from the absence of standardization need to be replaced with comprehensive data and discriminating analysis." [63] Although such studies do not exist yet, Tucker indicates that:

> The NATO military authorities already have underway two important bases for such studies. The first is a systematic collection of factual data regarding the specifications, locations, and number of weapons and supplies of munitions in Alliance inventories in sufficient detail to determine which supplies can be utilized with which weapons.
>
> The second is a long-range coordinated analytic study of the NATO-Warsaw Pact conventional force balance and how and with what effect these forces might be employed in representative conflict scenarios.[64]

These studies, together with more rigorous economic analysis, will permit NATO to project more specific and realistic estimates of the military and economic benefits and costs of standardization. Until that time, it may be appropriate to look beyond a precise quantitative cost/benefit analysis and assess the value of NATO standardization in terms of its positive contribution to the political cohesiveness of the alliance.

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[63] Tucker, op. cit., p. 36.
[64] Ibid.

CONTINUING OBSTACLES TO STANDARDIZATION

The Transition to the Two-Way Street

In 1976, Congress passed legislation committing the United States as a matter of national policy to procuring weapons systems for the use of American forces in Europe that are standardized or at least interoperable with those of other NATO members.[1] This legislation also expressed the sense of the Congress that progress toward standardization would be enhanced by an expanded "two-way street" in interallied procurement of arms and equipment. In reviewing specific weapons procurement decisions made by the Defense Department pursuant to these policies, though, Congress has not formed a consensus on whether *each* weapons system advanced in the name of standardization must conform with the criteria of greater military effectiveness and cost savings, or whether costs and benefits should be measured on a much broader scale.

One body of opinion in the Congress has maintained that not only must standardizing a weapons system not degrade its combat performance, but also it must generate actual cost savings. In effect, this view has contended that each step toward standardization must itself be cost effective; for example, a XM–1 incorporating components interoperable with the German Leopard 2 tank must not cost more or perform less capably than a nonstandardized design.

Support for this perspective in the House contributed to the action by the conference committee on the fiscal year 1977 DOD appropriation authorization adding a provision to the bill requiring that the Secretary of Defense "take into consideration the cost, functions, quality, and availability of the equipment to be procured [pursuant to standardization]."[2] This provision reflected the House conferees' concern that "standardization should not become a means of bypassing prudent considerations in the procurement process."[3]

The dispute over cost considerations has centered on the authority of the Secretary of Defense to waive the Buy American Act in order to procure European-produced equipment—even in cases where the cost of that equipment exceeded that of similar U.S.-made equipment. While Public Law 94–361 made explicit the Secretary's authority to determine that choosing U.S.-made equipment over European-made equipment is "inconsistent with the public interest," it did not clarify whether the "unreasonable cost" of foreign equipment would militate against such a determination.

The provision's ambiguous wording permitted conflicting interpretations of the Secretary's latitude to invoke the "two-way street" policy

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[1] Public Law 94–361, sec. 802.
[2] Ibid.
[3] U.S. Congress. House. Committee of conference. DOD Appropriations Authorization for Fiscal Year 1977 : conference report to accompany H.R. 12438, 94th Cong., 2d sess. (Rept. No. 94–1305), Washington, D.C., U.S. Government Printing Office, 1976, p. 53.

in cases where European arms were not less expensive than their U.S. counterparts. Some Congressmen maintained that such discretion had not been granted; others countered that the legislation created "no strings" on the Secretary's authority to act.

The absence of agreement on this crucial point reinforced the conviction of many Europeans that Congress would continue to measure costs and benefits within the parameters of the individual project. For example, a recent North Atlantic Assembly reported concluded:

> It is obvious that standardization on European projects would only be considered [by the Congress] if their adoption would mean superior military capability and if they did not involve additional expense.[4]

With a few exceptions, such as the Belgian MAG–58 machinegun, the French/German Roland missile, and the British Harrier aircraft, European weapons systems have not been competitive with their U.S.-made counterparts in terms of either military or economic criteria. European armaments are at a disadvantage because of Europe's lower productivity rates, higher labor costs, suboptimal economies of scale, and relative technological inferiority. As a result, applying cost and performance criteria narrowly effectively forecloses early significant expansion of the "two-way street."

Two alternative courses of action are available to the Congress if it tries to make the "two-way street" a reality. A long-term approach would be to continue to hold to a narrow application of military and economic criteria while waiting for a new European competitiveness to evolve. European weapons systems which were inferior to U.S. products in terms of either cost or performance would not be procured. The emphasis would be on encouraging the emergence of an integrated and collaborative European production base through indirect means.

There are two principal disadvantages to this approach. First, it presumes that the Europeans would continue to "buy American" in the absence of reciprocal U.S. purchases, that is, that Europe would accept standardization on the basis of U.S. equipment in the interim period before they achieved an integrated and competitive armaments industry. Most assessments of European attitudes toward standardization indicate that they expect the "two-way street" to be established now, not some time in the future. Second, this approach presumes that the technology needed to make Europe competitive will be transferred via coproduction and licensing arrangements. This point will be discussed in detail in the next section.

An alternative course of action would be to encourage the development of a new European competitiveness in a much more affirmative manner. In brief, the Congress could expand the "two-way street" now by beginning to authorize procurement of a substantially higher number of European weapons systems—even if they were not superior to or less costly than equivalent U.S. systems. The emergence of an integrated European armaments industry would in this case be encouraged by opening the U.S. market to European firms. The opportunity for longer production runs, and hence more efficient economies of scale,

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[4] Report on the Activities of the Sub-Committee on European Defense Co-operation, Military Committee, North Atlantic Assembly Report No. T 166 (76), November 1976, p. 5.

could provide a strong incentive for the European states to act on a united and collective basis.

This approach would entail measuring the costs and benefits of standardization on a much broader scale. While individual steps toward standardization might not optimize cost or performance objectives, the aggregate gain for the alliance might well be greater than the sum of the parts. Benefits would be measured in terms of (1) the reduction or elimination of duplicative R. & D. and production, (2) a streamlining of logistics support requirements, and (3) a substantial improvement in tactical flexibility and responsiveness.

The principal disadvantage of this approach is that it entails deploying equipment that may be, at least in the short-term, less advanced or more expensive than what would be available through domestic sources. In addition, the expectation that the opportunity for longer production runs would act as a catalyst for increased European armaments industry competitiveness may not prove true. The question before Congress, then, is whether costs at the microeconomic level would be more than offset by benefits at the macroeconomic level.

Technology

If NATO were agreed that standardization should be approached solely on the basis of U.S. equipment, technology would not present a significant obstacle to progress. While it is true that in a few areas (e.g., forward air defense, armored vehicles, sonars, metals research, and shallow-water acoustic research) European technology is regarded as better than or equal to that of the United States,[5] in the vast majority of cases U.S. weaponry incorporates the leading edge of qualitative improvements available to the alliance. Since leaders on both sides of the Atlantic are committed to standardization via the "two-way street," the problem of Europe's relative technological inferiority must be solved if standardization is not to be achieved at the expense of NATO's qualitative superiority.

In dispute is the appropriateness of one solution, technology sharing, versus another, technology building. The Defense Department contends that one of the salient advantages of the coproduction approach is that it permits the transfer of technology "to the other producers for use in follow-on or spin-off projects." [6] While it is generally conceded that in the short run America's technological dominance will insure that the United States "wins" most R. & D. competitions, DOD maintains that over time technology sharing would enable the Europeans to become increasingly competitive.

Europeans who are distrustful of U.S. motives in promoting competitive R. & D. believe that coproduction will cripple efforts to achieve greater European industrial integration. This view fears that coproduction will relegate European firms to the role of "subcontractors" to U.S. firms and doubts whether first quality technology will in fact be transferred. Those who hold this view point to the fiscal year 1977 DOD report on R. & D. for proof that the United States is not interested in surrendering its technological dominance.

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[5] GAO Report B–167034, op. cit., p. 11.
[6] Rationalization/Standardization Within NATO, op. cit., p. 54.

In a section of this report on international research and development cooperation, Dr. Currie states that the United States seeks to accomplish the objectives of standardization by:

> Improving the quality of Allied hardware (either Allied-funded developments or Allied purchases of U.S. equipment) by making advanced technologies available, without compromise to the U.S. technological/industrial base, market dominance and overall vitality.[7]

The report concludes that a balance must be maintained between stimulating European technological competitiveness and protecting U.S. technological dominance as a vital national asset.[8] While U.S. *policy* may call for some measure of commercial protectionism, recent concern over Israeli arms export demonstrates that *in practice* coproduction and technology sharing can lead to weapons competition with U.S. products.[9]

One alternative to technology sharing is technology building. This "Europe first" approach calls for individual European firms to forego coproduction arrangements with U.S. firms in favor of multilateral European developments. However, there are two principal flaws to this approach. First, Europe does not now compete with the United States in terms of R. & D. expenditures. The Defense Department estimates that the United States spends twice as much annually on nonstrategic R. & D. as the rest of the alliance combined.[10] Second, without substantial non-NATO exports, the European military market is not broad enough to sustain the pace of technological competition. Callaghan suggests one solution, a massive U.S. commitment to "Buy European"; however, the United States fears that this approach would result in the alliance being equipped with technologically inferior weaponry.

In recognition of these handicaps, many European firms are seeking a middle ground; that is, they are pursuing cooperative ventures on both a trans-Atlantic and European basis. In this context, coproduction arrangements are not regarded as an alternative to European integration, but rather as a temporary necessity while further attempts to integrate European industry are explored. Public Law 94–361 appears to support such a "two-pronged" approach. This legislation codified Congress' encouragement of *both* coproduction agreements *and* greater European armaments collaboration.

Military Doctrine

The 1976 DOD report on NATO standardization declares, "Without a common understanding of how a defense should be conducted, one Ally could not effectively reinforce another or cooperate in logistics or weapons development tasks."[11] The report documents significant progress in the areas of common military doctrine, compatibility of force structure, and agreement on the general outlines of weapons requirements. Especially noteworthy was the 1976 agreement on Allied

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[7] The Department of Defense Program of Research, Development, Test and Evaluation, Feb. 3, 1976, pp. VIII–1.
[8] Ibid., pp. VIII–2.
[9] Aviation Week and Space Technology, Dec. 13, 1976, p. 14.
[10] DOD Program of R.D.T. & E., op. cit., pp. VIII–2.
[11] Rationalization/Standardization Within NATO, op. cit., p. 11.

Tactical Publication (ATP) 33. ATP 33 establishes the basic air warfare doctrine for NATO and coordinates all activities related to the employment of air power in the central region, including operational tactics, force structure, and weapons requirements.[12]

Despite such improvements, however, agreement on weapons requirements remains difficult. As the DOD report notes, "National governments and their ministries of defense will make the final judgments, and they will not always agree with NATO military authorities or with their Allies."[13] The 1975 three-nation main battletank gun competition illustrates this reality well. Although choice of a common gun for NATO's next generation tank has been a major tripartite standardization goal between the United States, Britain, and Germany, each state interpreted the results of the tests as a "victory" for its gun.[14] In this case, then, the attempt to coordinate military requirements resulted in three new weapons, not one.

While the apparent solution to this problem would lie in a central procurement agency vested with veto-proof powers to define weapons requirements and select the winning R. & D. design, no NATO nation is willing to delegate this degree of sovereignty. While Public Law 94–361 expresses the sense of the Congress that weapons systems being developed for NATO "shall conform to a common North Atlantic Treaty Organization requirement," it does not suggest a specific mechanism or institution by which such agreements could be derived.

European Economies of Scale

A prerequisite for a successful comprehensive approach to standardization is progress toward rationalization of European arms production capabilities. As a practical matter, standardization will not be politically acceptable to Europe without a two-way street in arms sales. But, most observers agree, the street will bear traffic largely from the United States to Europe unless Europe rationalizes its arms manufacture using mergers and/or other forms of industrial cooperation to eliminate wasteful duplication and concentrate efforts on a narrower range of weapons systems. The London Economist, for example, commented that—

> First of all, Europe has to recognise that over the long haul the United States is not going to buy inferior equipment, based on yesterday's technology and charged at non-competitive prices, just in order to support European industries. If a two-way street of arms sales is to work on a significant scale, Europe will have to be able to compete on equal terms.
>
> This means that Europe's arms manufacturers have to do some pretty bold development to get themselves up there with the technological front-runners. They will have to cut out a lot of the duplicated research they now indulge in. There will have to be some rough competition inside Europe, in which the losers are allowed to die off and are not fed massive economy-weakening subsidies. It also probably means that Europe is going to have to give up the idea of competing with the United States in every area of defence technology. In the areas where it is hopelessly behind, Europe will be better off buying American off the shelf rather than pumping money endlessly into what amounts to no more than an effort to keep from falling even further behind.[15]

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[12] Aviation Week and Space Technology, July 5, 1976, p. 17.
[13] Rationalization/Standardization Within NATO, op. cit., p. 20.
[14] Armed Forces Journal International, April 1976, p. 12.
[15] The Economist. F–16 Over Europe, London, June 7, 1975, p. 13.

And Thomas A. Callaghan, probably the leading advocate of standardization on either side of the Atlantic, has made a similar observation:

> The individual nation states of Europe provide markets too small for an adequate division of labour—too small to sustain healthy defence industries. But that's not all. The individual nation states of Europe are too small for military trade and cooperation with the United States; the defence industries of Europe are too small to produce weapons to a transatlantic scale.
>
> These structural deficiencies of market and industrial scale in turn diminish Europe's investment in facilities, equipment and research. As a consequence, the European defence industry is less efficient than it otherwise might be, and the European technology base is much weaker than it ought to be.[16]

Rationalization of the European arms production capability is as difficult as it is important. Although the question of arms manufacture is an area of special importance to national governments, it must also be seen as part of the more general problem of creating a European industrial base in *all* areas of manufacture. All the primary and secondary European NATO producers of armaments (France, Britain, West Germany, Italy, the Netherlands, and Belgium) are also members of the European Community. The treaty establishing the European Economic Community specified that the activities of the Community should include removal of obstacles to free movement of goods, persons, services, and capital among the member states. The treaty focused particularly on elimination of tariff and other direct barriers to trade. It even provided the legal basis for harmonization of company law among the member states. But it did not provide specific legal authorization for the wide variety of measures necessary to create a European industrial base.

When the Community members in 1972 proclaimed that they would seek full economic and monetary union by 1980, it was clear that barriers to a European industrial base would have to begin to fall for their goal to become reality. As the EC Commission (the Community's executive) emphasized in a 1973 report, establishment of a European industrial base "presupposes the existence of a single market operating like a national market in which people, goods, services, capital, and companies circulate freely. A single market of this kind has been only partially achieved for the circulation of goods." [17]

The barriers to development of a European industrial base include a variety of technical measures relating to tax policies, conflicting company law practices, and consumer and environmental protection. But the area of most direct relevance to arms production is government procurement practices. The EC Commission report cited above states that "Products and goods intended to satisfy the needs of the State * * * are still excluded by and large from the free movement of goods * * *. Consequently, certain sectors which depend on public orders to a large extent e.g., certain advanced technology industries, are automatically deprived of the benefits accruing from economies of scale." [18] In sum, the existence of duplicative and wasteful arms production efforts are part of the general unwillingness of the members of the EC to remove the most significant barriers to creation of a Eu-

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[16] Callaghan, Thomas A. Standardization: Le defi Americain a l'Europe, NATO Review, Brussels, October 1976, p. 26

[17] European Community. Commission. Memorandum from the Commission on the technological and industrial policy programme, May 7, 1973. Bulletin of the European Communities, Supplement July 1973, Brussels, p. 5.

[18] Ibid., p. 8.

ropean industrial base, and solutions to the problems in the arms sector will depend in part on whether progress is made on the more general problem.

In practice, rationalizing the European arms effort will eventually require the formation of transnational companies through industrial mergers. But such mergers will not come about simply by removing technical obstacles. Mergers of arms manufacturers across European borders have been the exception rather than the rule, and those mergers that have occurred have largely been intranational rather than international.[19] It has been observed that "Industry does not appear to be in any hurry to arrange mergers. Some German industrialists favour the Commission's concept, but see it as a long-term aim * * *. French industry also favours the formation of international companies, but sees this as less important than the creation of a potential European market * * *. British aircraft companies * * * seem content to keep their separate identities and favour co-operation through formation of permanent consortia rather than through mergers."[20] Thus, in the absence of a European armaments market, European industry has not been motivated to create European armaments industries. Roger Facer, in his commentary on the subject, has put it well:

> The long-term advantages of size will not easily outweigh the short-term disadvantages to * * * the existing companies of exchanging the direct support of their own governments (and its resultant measure of prosperity) for the uncertain position of being dependent on the ability of several governments to agree.[21]

In theory, one alternative to mergers would be a consortia approach, but most observers find this approach inadequate to the long-term task. Consortia based on single projects are already used quite extensively, but they are quite simply an ad hoc extension of the present uncoordinated approach to arms production. Permanent consortia, while offering some advantages, would likely suffer from debilitating deficiencies. They would lack the important advantage of common management and likely suffer a critical lack of "the technical and commercial dynamism which a successful modern business needs."[22]

Thus, a degree of consensus seems to have built around the necessity for creating a European armaments market in order to encourage industrialists to build a European armaments industry. The approach, which is at the heart of the EPG undertaking and a crucial element of the EC Commission's "Action programme for the European aeronautical sector",[23] is through a cooperative European system of defense procurement.

According to this approach, European agreement on common procurement of weapons systems would create pressure for industrial cooperation across European borders, leading to collaboration and mergers to achieve the combination of research and development resources and production capacity to produce technologically advanced and cost

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[19] Facer, Roger. The Alliance and Europe: Part III—Weapons Procurement in Europe—Capabiliites and Choices. Adelphi Paper No. 108, the International Institute for Strategic Studies, London, 1975, p. 27.

[20] Ibid., p. 40.

[21] Ibid., p. 41.

[22] Ibid., p. 42.

[23] European Community. Commission. Action programme for the European aeronautical sector. (Commission Communication and Proposals to the Council forwarded on Oct. 3, 1975.) Bulletin of the European Communities, supplement, November 1975, Brussels, 1975, p. 10.

effective weapons systems. As was pointed out earlier, as long as the market for weapons remains organized on a national scale, there is not sufficient motivation for industries to take the lead in creating European-scale industries. If the governments are willing to create the market through agreement on common procurement—and willing to follow up on that commitment with the necessary changes in government procurement practices and national legislation—European industries will, according to this approach, adapt to serve the market.

The bottom line on this, just as on so many other "obstacles" to standardization, is that if the governments decide they must rationalize the European arms base, they can. The process could take a decade or two, but there are no obstacles which are insurmountable *if* the governments make the effort. The problem is that the history of the last 25 years of efforts in this area has been marked by a disinclination to compromise national sovereignty. The question is whether things have changed, or will change, all that much.

THE POLITICAL-ECONOMIC FRAMEWORK

Interdependence and Standardization

The health of the United States and West European economies and political conditions throughout the Atlantic area are variables which can have a significant and direct impact on the ability of governments successfully to pursue cooperative policies such as standardization of NATO forces. Cooperation in arms development, production, and procurement cannot be separated out from this larger fabric of United States-West European relations. Indeed, thorough standardization would require unprecedented acceptance of interdependence ranging across the full spectrum of political, economic, and security interests of the Atlantic nations.

If interdependence were the dominant operative principle of the Atlantic Community, NATO would be well on its way to having standardized weapons systems. It is a fact that the United States and Europe are already linked so closely economically that changes in American economic well-being or policies have a direct impact on the economies of Western Europe; and, to a somewhat lesser degree, economic developments in Europe affect the economic health and overall security of the United States and Canada. Growing interdependence, while restricting the margins within which countries can act without affecting the vital interests of other countries, does not necessarily mean that national interests will coincide, even in areas where interdependence is most evident. The fact of growing interdependence exerts pressures for more careful definition of common interests, narrowing the areas of divergence, articulating common goals, and agreeing—when possible—on common programs. To what extent, then, could the current political and economic framework support major standardization initiatives? What are some of the potential limits on cooperation suggested by the current state of United States-European relations?

The Impact of Economic Conditions on Standardization

The general condition of the Western economic system is an important factor affecting the potential for arms cooperation. In general, the various possible approaches to the rationalization of arms production and procurement involve some difficult short-term economic costs and dislocations for some or all of the participants. When the Western economies are in recession, the need for cooperation may be perceived, but the short-term costs pose serious obstacles. In times of economic growth and expansion, margins exist to support these short-term costs, but such margins are minimal or unperceived in times of recession. The impact of individual production contracts is magnified economically and consequently politically. Loss of contracts to a foreign producer

results in direct and obvious losses of jobs, and the economy is not able to absorb those losses in other areas of industrial production if economic activity is in the doldrums. In such circumstances, the political will to make decisions on behalf of long-term objectives such as standardization is significantly weakened.

The importance of general economic conditions to prospects for cooperation has been illustrated by the fact that European integration has advanced in times of economic growth and retreated under the pressures of recession. The far-reaching goals articulated by the leaders of the European Community at a summit meeting in 1972 were dashed by the recession of the mid-1970's. Instead of moving toward closer economic and monetary union, the member states reverted to more narrow approaches to their economic difficulties. Some states with the most serious problems—Italy in particular—were granted exceptions to Community rules and procedures, actually decreasing the degree of cooperation and integration among the economies of the member states. More generally, tendencies toward freer trade among the industrialized countries have prospered during periods of economic growth while protectionism has risen during periods of recession.

How then, does this relate in particular to the future of NATO standardization? Simply put, if the Western countries make a sufficiently strong recovery from the current recession, chances will improve that NATO members will accept short-term costs in hopes of gaining long-term benefits. If the recovery is not sufficiently strong, industrial production does not revive vigorously, and unemployment remains at high levels, standardization initiatives may be severely limited. Because the rate of the American recovery is a crucial factor in the recovery of the European economies, what the President and the Congress do in the area of broad economic policy could be critical to prospects for Atlantic arms cooperation.

The U.S. Commitment

There will be little chance of decisive progress toward NATO standardization unless the United States continues active leadership in its behalf consistent with the two-way street concept. Such a role would depend on the initiative of the White House, the cooperation and effective execution of Government agencies and the Armed Services, and a positive approach by Congress.

The new administration appears prepared to urge an active and supportive role on behalf of standardization. President Carter in 1976 wrote that:

> Against a background of increasingly evident nuclear parity, the balance of conventional forces is of growing importance * * *. Soviet forces appear to be configured for brief, intensive all-out offensive operations. Effective deterrence requires that NATO have a clear capability to withstand that initial attack * * *. A thorough review of NATO's strategy and force posture, to ensure that it is adapted to a changing environment, should be mounted as matter of urgency. *Increasing coordination of NATO procurement activities—including standardization of major weapons components—is also of the essence.*[1]

To implement such an objective, the administration will particularly require the cooperation of the Armed Services. If the services, in plan-

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[1] "The United States and Europe: The Future President's Views." European Community, October 1976, p. 19. [Italic added.]

ning their weapons requirements, do not give primacy to the capabilities of U.S. forces for joint allied operations in the European theater, it could be extremely difficult to reach agreement with the European Allies on common requirements and systems. The pressures for such an orientation have already been reflected in the Army's planning, described by Robert Komer as "* * * the Army's wise decision, after disengaging from Southeast Asia, to reemphasize as its logical primary mission, NATO deterrence and defense." [2] Yet Komer argues that this reorientation has not yet gone far enough:

> As for the U.S. Army, the tendency is to design and produce equipment as if the Army were the only force in NATO and we'd be fighting the Russians alone. Even in those few cases where we do seek common equipment the Army has often tripped over its own overzealous performance demands. We cannot expect that equipment designed for allied use as well necessarily meets all our own exaggerated criteria.[3]

Finally, the role of the Congress could be critical. The Congress represents the broad spectrum of economic and political interests in the United States. For the initiative to proceed, Congress must be convinced not only that the long-term benefits of standardization outweigh the costs, but also that the policies chosen by the executive effectively compensate for whatever risks are involved.

More broadly, the Congress would have to remain convinced of the wisdom of the U.S. commitment to European defense and the central role of U.S. forces in that defense. A new congressional push for unilateral U.S. force reductions would seriously undercut U.S. leadership in the alliance.

Principal factors in this congressional equation will be whatever consensus may emerge concerning Soviet intentions and capabilities in Europe, including the question of whether the negotiations on mutual force reductions will ever bear fruit; and, as has been true historically, the congressional perception of U.S. involvement in European defense will depend in part on the commitment the European countries are willing to make. In particular, the Congress would have to be convinced that the European efforts to rationalize their own armaments efforts do not have an anti-American appearance or impact.

Atlantic and European Perspectives

The future of NATO standardization will depend on whether an Atlantic framework for cooperation can effectively accommodate European requirements for a profitable and distinct role. The United States and the European Allies have accepted the premise that the two-way street concept requires that European arms production capabilities be rationalized. But European arms production cannot be rationalized without Europe's most prolific producer, France. The dilemma that presents itself is that French political attitudes could block agreement on the steps necessary eventually to fit European cooperation within an Atlantic framework.

While this old question of "Atlantic" versus "European" approaches to Europe's problems has lost some of its theological overtones in recent years, it nonetheless remains an important part of the political

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[2] Komer, Robert. "When Friends Get Together: Coalition Warfare." Army, September 1976, p. 28.
[3] Ibid., p. 29.

environment—particularly in so far as Paris is concerned. The French are participating in the work of the European Program Group presumably in large part because they too recognize the potential benefits of rationalization of European arms production and a wider Atlantic market for French weapons. The purchase by Belgium, the Netherlands, Norway, and Denmark of the U.S. F–16 instead of the Mirage F–1 and the impact on the aircraft market of the cooperatively developed and produced MRCA's has brought home to Paris the economic arguments for closer cooperation with its allies. The French arms industry cannot thrive solely on French and non-NATO markets. But it remains to be seen whether the French will be willing to go the further distance required to make the EPG efforts compatible with NATO—the Atlantic dimension. This would require at least implicit coordination with NATO tactical doctrine and weapons requirements.

The French internal political scene is not particularly conducive to closer ties to NATO. The French Government, under centrist President Giscard d'Estaing, has already tested the limits of movement toward closer cooperation with NATO. The French Chief of Staff, Gen. Guy Mery, published an article in the prestigious Journal Defense Nationale in June 1976 which suggested that France would fight alongside NATO forces on the front lines in the case of a Warsaw Pact attack. In response to Gaullist and left-wing attacks on the Mery article, the Government responded that the approach represented no change in basic French policy.[4] All the same, French defense planning for the next 6 years calls for significant increases in expenditures for conventional forces,[5] an emphasis clearly in line with NATO perceptions of what is needed to deter a Soviet attack.

There seems no way that a French Government in the foreseeable future would reintegrate French forces into NATO. Only the center of the French political spectrum would be willing to countenance such a move, and that political spectrum is increasingly polarizing between the Gaullist right and the Socialist-Communist left which both oppose reintegration strongly. Practical economics would exert pressures on any French Government, however, and neither the right nor the left would necessarily end participation in the EPG.

There is no question but what, to succeed, the EPG effort must be amicably coordinated with the United States and Canada. Nevertheless, the current political climate in France most likely requires that formal coordination be done in an Atlantic framework that is at least technically separate from the integrated command structure of NATO. This distinction might seem absurd on this side of the Atlantic. But such distinctions that might have to be made to accommodate Paris' domestic politics might be worth the doing if the desired result is de facto progress toward closer Atlantic defense cooperation which includes the French within a distinct European element.

If Paris sets terms that make effective coordination with the United States impossible, then the other allies might abort the EPG effort and move their defense cooperation back into the Eurogroup framework. They would do so only reluctantly, however. Without the French, an effective European contribution to standardization would

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[4] Cook, Don. "For France, Acceptance of Allies' Strategy." Los Angeles Times, June 13, 1976, pt. 4, p. 3.

[5] Ropelewski, Robert. "French Push Updated Conventional Forces." Aviation Week and Space Technology, June 14, 1976, p. 21.

be sharply reduced, and even though the other allies are prepared to use bilateral agreements they do not view this as a satisfactory long-term solution.[6]

In considering the political environment for standardization, Gardiner Tucker has issued a caution to NATO countries concerning the overwhelming importance of accommodating successfully the Atlantic and European perspectives.[7] He argues that attempts to rationalize the European armaments base, however necessary, should not be permitted to undermine the objective of efficient use of that base to provide the armaments the alliance needs. Both needs can be met, he says, if it is possible to reach alliance-wide agreement on objectives and principles. In reaching such agreement, he notes that there are legitimate interests that must be satisfied on both sides of the Atlantic:

> At a deeper level, these armaments issues must be seen in the light of the need to preserve the necessary level of commitment of member nations to the common defense of NATO. * * * European nations must sense that they are deriving an economic benefit from Alliance armaments activities. At the same time, the United States must also see that its economic interests are served, for if American public opinion gains the impression that the other Allies are "squeezing the United States out," political support for continuing the present level of United States commitment in Europe could be seriously jeopardized.[8]

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[6] A report to the North Atlantic Assembly in November 1976 on the activities of the Sub-Committee on European Defense Co-operation (previously cited) concluded that "Several of the important advances in the field of Atlantic cooperation have been achieved on a bilateral basis as in the case of the United States-Federal Republic tank evaluation and the United Kingdom-United States Memorandum of Understanding [of November 1975 in which the U.K. agreed to drop two British weapons developments in favor of an American one and a German-French one and offering the allies a third British system for common adoption]. These are obviously an important part of a furthering standardisation but *real progress depends on the production of a coordinated European approach.*" [Italic added.]

[7] Tucker, op. cit., p. 49.

[8] Ibid.

CONCLUSIONS

Standardization is a means to an end. The end is to sustain the ability of NATO forces to defend against a Warsaw Pact attack, and thus hopefully to deter such an attack, within the current and projected constraints on resources available for defense. In addition, even if Warsaw Pact capabilities were not improving, rationalizing the NATO defense effort would make sense in terms of eliminating waste, mitigating divisive competition among the allies for arms sales, and strengthening political and economic relations between the United States, Canada, and Western Europe.

If the Atlantic nations see their future security and economic well-being as inextricably linked in a relationship of increasing interdependence, it would make sense for them to create something like an Atlantic common market in defense technology, production, and procurement. Such a market could rationalize arms production in NATO countries making use of the stimulus provided by competition in the marketplace but orienting that competition toward ultimate agreement on common weapons systems. Such a far-reaching integrative approach would likely come closest to optimizing the military, economic, and political benefits of standardization. NATO forces would attain a high degree of commonality and interoperability; economies of scale would be realized and unnecessary overlap in research and development would be eliminated; interdependence of the Atlantic nations would be more effectively institutionalized; and a large and rationalized Atlantic market for weapons systems would reduce pressures for arms sales outside the Atlantic area. In sum, the Atlantic nations would be stronger in all respects and would be much less vulnerable to threats to their security from within or outside the Atlantic area.

While the picture portrayed above might be a desirable long-term aspiration for the future of the Atlantic Community, there is considerable doubt as to whether it is a practical objective for policymakers today. Political consensus and economic integration do not appear to be sufficiently advanced within Europe or in the wider Atlantic area to permit acceptance of such a thoroughly cooperative approach in the near term. Nevertheless, the common and individual interests of all the Atlantic nations are poorly served by the current state of destandardization. In spite of the numerous obstacles and limitations, the United States and its allies would benefit from judicious movement toward standardization using whatever tools and methods of cooperation are most effective and yet politically feasible.

Unless and until there is sufficient political consensus in Europe and between Europe and the United States to agree on innovative new cooperative structures, the NATO countries will have to depend on tools and approaches which fall short of maximizing economic benefits while at the same time improving military capabilities. The costs and

benefits of standardization in this environment will vary according to the approach taken, and in 1977 there are as yet no universally accepted assessments of the precise cost and benefit relationships involved.

It is nonetheless possible to make some general observations about the various possible approaches, each of which might be able to play some part in building a cooperative base *if* the limitations of the approaches are more clearly understood.

Direct purchase of an ally's weapons system permits the purchasing state to avoid the R. & D. costs of developing a similar system and the expense of establishing a domestic production base. Production by a single manager results in longer production runs, thus achieving a more efficient economy of scale, and insures equipment standardization between buyer and seller. The limitations of this approach are negative balance-of-payments effects—unless offset by other military or nonmilitary trade—domestic employment losses, and the risks of relying on a foreign source for spare parts. Whether this approach will be applied more widely within NATO will depend on whether the governments can compensate for these drawbacks and upon their willingness to look beyond the individual project level and establish a broader framework that balances purchases with sales (the "two-way street").

Competitive R. & D. with licensed coproduction is the approach to standardization currently favored by the Defense Department. Legislation passed by the Congress in 1976 endorsed this approach and expressed the sense of the Congress that coproduction would minimize the potential economic hardships, particularly the loss of domestic employment, to participating states and increase the survivability of the alliance's production base in time of war. This approach renders the military advantages of standardization by harmonizing the weapons systems of the participating states and represents a compromise between the higher costs of individual country production of unique equipment and the lower costs of common procurement from single-source production. Whether coproduction finds a wider acceptance on the part of the European members of NATO will depend largely on the U.S. willingness to regard European firms as coequal partners rather than subcontractors.

Cooperative R. & D., with two or more states teaming up to design common equipment from scratch, has been somewhat discredited in the United States by some bad past experiences. It is an approach which might have a brighter future once there is a broad consensus on the need for standardization, closer agreement on the requirements of allied forces, and rationalization of the European armaments base.

Short of standardizing systems, there is a near-term requirement for *making dissimilar systems interoperable*. While interoperability can produce obvious military benefits, it does not necessarily produce cost savings, and in some cases may actually add to costs. If weapons systems are not standardized, the NATO countries will continually be struggling to make systems interoperable. Proponents of standardization see interoperability as a necessary intermediate measure, but not a long-term solution.

If these approaches are to be combined successfully to produce progress toward Atlantic arms cooperation, a number of factors merit consideration. They include:

—The heads of government of the NATO countries would have to place a top priority on standardization. As history has recorded, rhetorical support is not sufficient. Support would have to be active, including, possibly, a special high level meeting to agree on principles for cooperation. It could also include, as Senators Nunn and Bartlett have proposed,[1] designation of a high level policy official in each of the allied defense ministries with power to monitor application of the principles. It could also include agreement to work toward collaboration on a major weapons area such as the next generation of fighter aircraft.

—The parliaments of the NATO countries and the U.S. Congress would have to sustain their support for standardization. The parliaments can have a decisive influence, given their responsibilities for funding arms projects. A weakening of support for standardization in the U.S. Congress, in particular, could spell the end of the entire standardization initiative.

—The United States would probably have to be prepared to buy European weapons systems when they represent advanced technology and would improve NATO capabilities, even if it meant initially higher costs. The United States would also have to be willing to share advanced American technology with the European Allies, particularly in areas where European specialization would be most promising. At the same time, the Europeans cannot expect the United States to take this approach unless they move toward rationalization of their arms efforts in a framework of cooperation with the United States and Canada.

—The Government of France must participate if rationalization of European arms production is to be come a reality. If the French do not cooperate, the other Europeans are left with the option of moving ahead without Paris, in so far as possible, in the hope that economic pressures will force the French to take a cooperative approach.

—American and European military leaders would have to work even harder to reach agreement on perceptions of the threat facing NATO and the tactics required to deal with that threat.

—American and European industrial leaders would have to attempt to learn more about each other's work techniques, trying to remove some of the technical obstacles to cooperation.

—A sustained Western economic recovery would create a more propitious atmosphere for acceptance of some of the short-term costs associated with the various approaches to standardization.

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[1] U.S. Congress. Senate. Committee on Armed Services. NATO and the New Soviet Threat, report of Senator Sam Nunn and Senator Dewey F. Bartlett, 95th Cong., 1st sess., Jan. 24, 1977, Washington, D.C., U.S. Government Printing Office, p. 20.

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