INTERNATIONAL COOPERATIVE RESEARCH AND DEVELOPMENT PROGRAMS

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From a review of the literature and more than 30 interviews from those who work on International Cooperative Research and Development Programs comes a wealth of theoretical and practical advice on how to help these often logistically, politically, and economically complex projects succeed.

Before undertaking an international cooperative research and development program (ICRAD), where does a program manager go to find guidance on what to do and what to avoid doing? There is a dearth of published data in this area, although some unpublished documents created for internal use do exist.

The study described here set out to answer that question. It consisted of research of the available literature as well as interviews with 32 people from the Defense Department, industry, and foreign military departments who work on ICRADs (defined as programs developed cooperatively by two or more nations in which the design or technical effort and the costs are shared by those nations). The aim was to obtain a cross-section of perspectives and cover a full range of factors relevant to ICRADs. With the addition of the author, the interviewees had more than 400 years of international experience out of a total of more than 800 years of overall work and acquisition experience; this is an average of more than 12 years international and 24 years overall experience per person. Most of this experience was with North Atlantic Treaty Organization (NATO) programs.

While the data is anecdotal, a large enough sampling was sought to provide a comprehensive overview. The research objective was to elicit frank comments and suggestions from experienced people that can be used by others to establish and implement current and future ICRADs. All interviewees were guaranteed anonymity (and unattributed quotes in this article are from interviewees).

WHY COOPERATE?

The Report of the Quadrennial Defense Review (Cohen, 1997) states that "we as a nation must often act in concert with others to create our preferred international conditions and secure our basic national goals. ...Therefore, it is imperative that the United States strives to build close, cooperative relations with the world's most influential countries." Furthermore, "To maintain this superiority, we must achieve a new level of proficiency in our ability to conduct joint and combined operations...The RBA [Revolution in Business Affairs] includes...increasing cooperative development programs with allies." For instance, the Navy reports a trend toward increased cooperation during the past decade (Figure 1) (Navy International Programs Office [NIPO], 1997). To the trend toward coalition warfare, Abbott (1997) adds the advantages of standardization, interoperability, common logistics, and the reduced defense budget as reasons for a greater mandate for cooperation.

The decreasing budget has resulted in a steady decline in government research and development (R&D) expenditures relative to industry (NIPO, 1997). The State Department points out that "the perception that we are withdrawing physically and psychologically undercuts Germany's essential interest in our

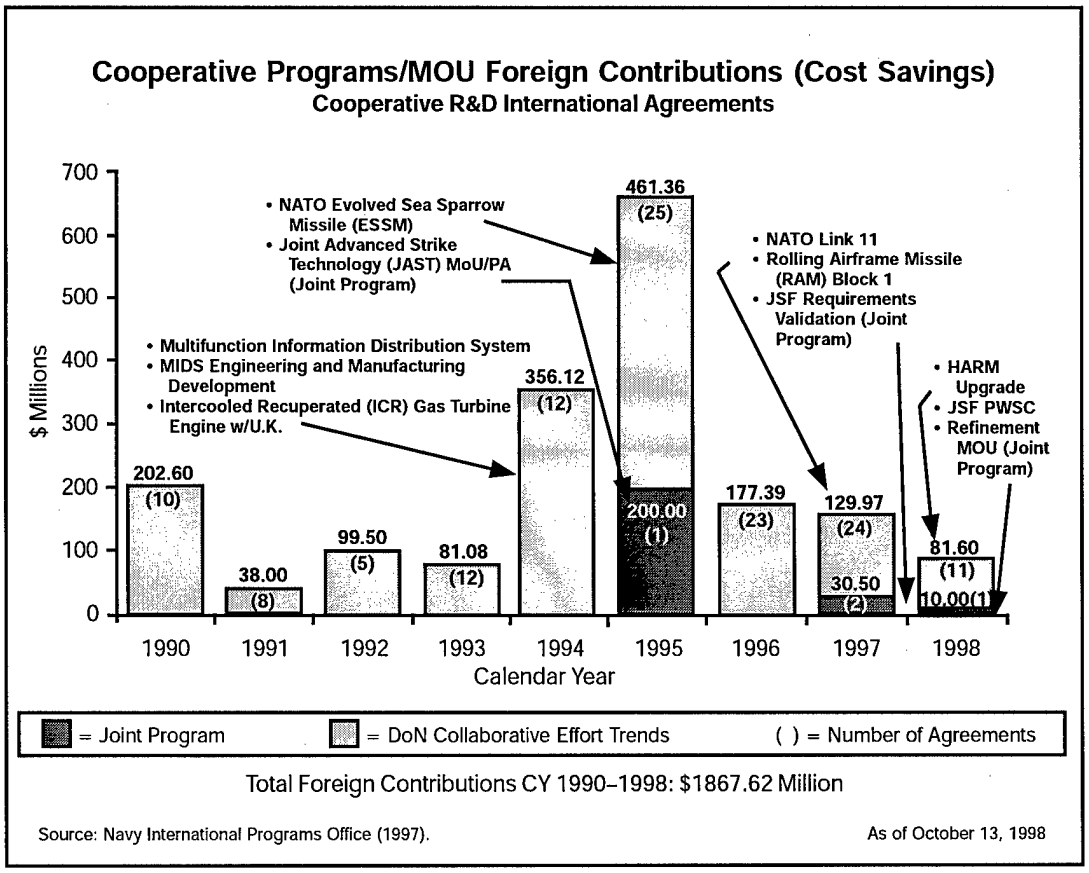
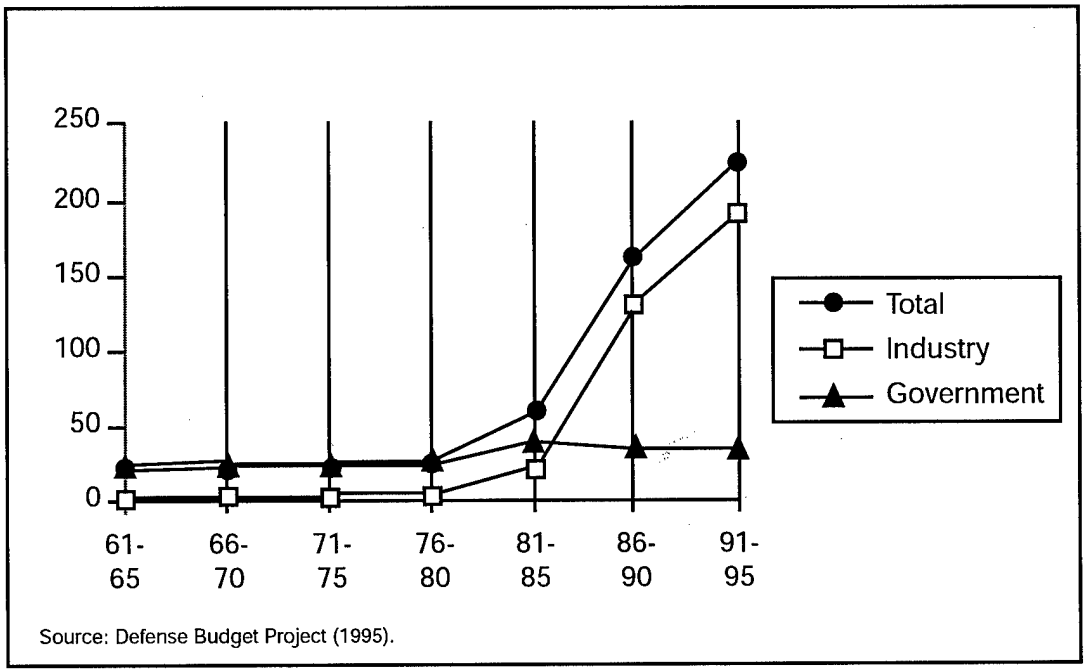


Figure 1. Department of the Navy Collaborative Effort Trends

security relationship, which allows it to pursue a pan-European agenda without appearing to threaten the rest of Europe. It also undercuts our interest in moving the bilateral relationship in directions that will positively affect outcomes in and beyond Europe" (Jones, 1997). Technologically, information warfare, operations other than war (OOTW), and the global simulation network present unique challenges best met globally, in concert with our friends and allies. Politically, ICRADs promote allied industrial bases, help allies defend themselves, and strengthen coalitions to forestall the establishment of "Fortress Europe" and "Fortress America." As President Bill Clinton (1997) observed, "the United States squandered Allied victory in World War I when it embraced isolationism." In today's global economy, commercial international programs are important to America's well-being, especially as the U.S. defense industry consolidates through mergers and acquisitions (Dalton, 1997) (Figure 2 [Abbott, 1997]). Thus, Department of Defense Directive (DoDD) 5000, *Joint Vision 2010* (Shalikashuili, 1997), and the *National Military Strategy of the U.S.A.* (Shalikashuili, 1997) all lend considerable support to ICRADs. In the words of one foreign interviewee, "America is a European power."

Why Not?

Cooperation has had "more starts than finishes" (Abbott, 1997), leading to pressure for pan-European versus transatlantic cooperation (D'Agostino, 1996). While many reasons for failure have been cited (e.g., program selection, poor timing, lack of training), many Americans perceive that the U.S. system is highly problematic



Source: Defense Budget Project (1995).

Figure 2. Growth in Industry-Led International Cooperation

(Kwatnoski, 1995) and that ICRADs add risk to program managers without compensatory advantages (Deputy Under Secretary of Defense for International and Commercial Programs, or DUSD[I&CP], 1997). Of course, these reasons do not address the nonrational or irrational effects of "not invented here," xenophobia, and cultural differences.

History

The DoD Authorization Act of 1986 initiated the NATO Cooperative R&D Program to promote more equitable sharing of NATO conventional research and development costs via cooperative projects. Congress believed that the Warsaw Pact was more cost effective than NATO due to lack of NATO cooperation (General Accounting Office, 1990). Congress appropriated "Nunn funds." Proposed by Senator Sam Nunn, "Nunn" funds are annually budgeted by Congress as a special fund (in four sub-accounts for the three services and the Office of the Secretary of Defense [OSD]) to be used as seed money to begin ICRADS. These funds can only be spent in the United States. Congress later added five non-NATO nations (Australia, Egypt, Israel, Japan, and South Korea, later followed by two more, Argentina and Jordan). Similarly, legislative relief (but not funds) was provided for cooperative production projects. Nevertheless, no cooperative program has proceeded through R&D, coproduction, and operations and support thus far. DoDD 5000.1 (1996), the acquisition "Bible," lists cooperation second (after purely commercial products and above joint programs) in its ordered hierarchy of materiel alternatives. In addition, DoD sponsors numerous other programs (such as a data exchange annex, or DEA) that could, in theory, develop into ICRADs.

"Because of ICRADs' poor track record, the Services didn't want to cooperate, creating a self-fulfilling prophecy."

In the past, however, programs chosen as ICRADs tended to be noncritical, low priority, poorly funded ones. Nunn funds would be used to cover startup costs for programs that did not make Service funding lists, and they could easily die when the Nunn funds ran out. International commitments that did not (in the Service's opinion) critically support war fighting requirements lost out in competitive Service program objectives memorandums (POMs). In other words, tactical support to marginal or fringe programs was insufficient to ensure their continuity when unsupported at the operational level. Even "strategic" generic support to ICRADs by the DUSD(I&CP) could only save a few select projects (the fate of one of these, the mobile extended air defense system, or MEADS, is still in question). In addition, entrenched bureaucracies, with their own agendas, made no concessions to ICRADs versus domestic projects despite ICRADs' inherent, added administrative burdens (e.g., memorandum of understanding [MOU] development and negotiation). To top it off, the bureaucracy "moves with the speed of a dead snail."

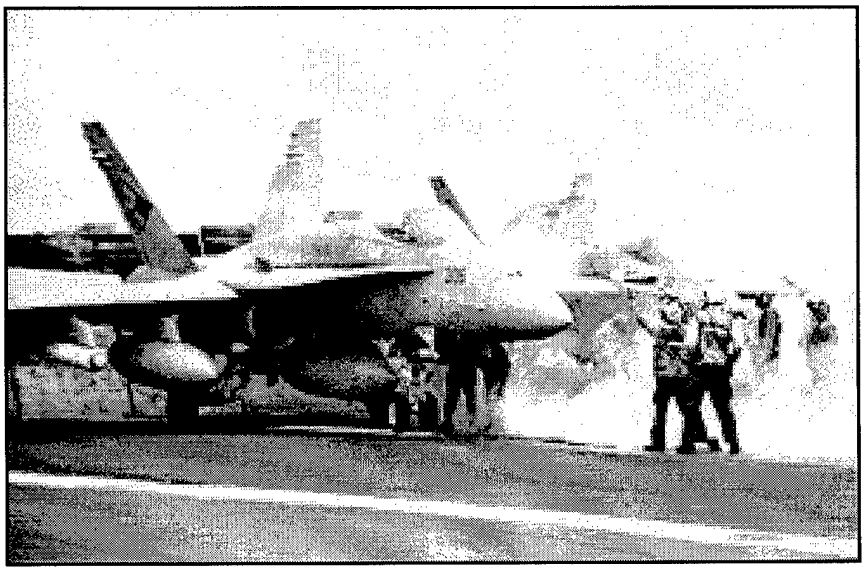
While larger programs are required to submit a Cooperative Opportunities Document, this generally has consisted of "the 47 reasons why they didn't become cooperative." Because of ICRADs'

poor track record, the Services didn't want to cooperate, creating a self-fulfilling prophecy. Since cooperative programs are more difficult and complex, they have a lower probability of success. Certainly they have more players with the resulting exponential increase in communications links. According to the Law of Requisite Variety, the problem and (solution) environments need to have the same level of complexity. Additional resources are required to handle increased ambiguity. According to Jacobs and Jacques (1986), an integrative, collegial, nonlinear, nonrational, open systems approach is required under conditions of increasing uncertainty. Such an approach is inherently nonbureaucratic.

Getting Started

As with any analysis of alternatives, both incentives and disincentives must be considered. The best candidate ICRADs propose to satisfy Service operational requirements (commander-in-chief needs) as well as those of NATO (used here to include the additional five nations—the seven Nunn nations plus Sweden—with whom Congress has specifically authorized ICRADs). Of course, multiservice requirements can add a broader support base. Technologies in which our allies can make more significant contributions through extant knowledge or mutual use (such as mine warfare, interoperability, or increased competition base) are highly advantageous prospects. Evolving technological needs such as coalition OOTW are also prime candidates.

One needs to "service the circuit" for possibilities and opportunities for cooperation. Unfortunately, the Services are not organized alike. For instance, one Service splits up authority by type of equipment, making it difficult to coordinate with other Services or nations that use centralized systems. The Services were not designed with international cooperation in mind. Of course, it's a waste of time to start a program with no compelling U.S. need (e.g., the success of the multifunctional



Official DoD photo.

The F/A-18

information distribution system [MIDS] was due to the F/A–18's need for it). It should be in the POM, or potentially so, in its own right.

ICRADs save scarce U.S. R&D funds, but they also take longer. In essence, the United States trades time for allied funds. The program in question must be able to withstand the added time required. Thus, the present International Cooperative Opportunities Group (ICOG) effort is aimed at very early stages of development; "gleam in the eye" timing. Unfortunately, in an era of declining budgets, this limits opportunities for larger (ACAT [acquisition category] I or II) efforts. "Adapting cooperation to an existing program is doing it backwards," and it results in disasters. Also, the timing of the project must be matched for the nations involved; required fielding dates must be comparable. Joint programs have similar challenges.

"The difficulties of introducing major change into a large bureaucracy are legion..."

Time can be saved and many problems ameliorated if a program is built upon prior efforts. A data exchange annex (DEA), an annex on a particular technical area to a master data exchange agreement between the United States and another nation, which allows for the international exchange of scientific and technical information among scientists and engineers, can serve as a springboard to a successful ICRAD. So can Engineer and Scientist Exchange Program experiences (Trimarran is one—a Navy ship development program) (Kwatnoski, 1995). Indeed, it may be valuable to continue a DEA during an ICRAD to facilitate communications and data sharing (easier to initiate under a DEA than under an MOU). While some say that "the best ones bubble up in a lab, while the weakest ones are top-down directed," others stress the need for buy-in from both the requirements and acquisition communities.

Relations With Higher Authorities

The difficulties of introducing major change into a large bureaucracy are legion: You can't turn an aircraft carrier in a 10-foot circle. A change agent must address the psychological turn radius; people operate under psychological laws rather than the laws of physics (Pritchett, 1993). Thus, a purely top-down approach rarely works—when it seems to work, it generally doesn't last long (only till the driving force leaves). There is a long list of blue ribbon panel reports and DoD initiatives one can review at leisure; the successful change they have accomplished, however, makes for a quick read indeed.

Some evolutions have better chances for success. The recent introduction of acquisition reform may be one, particularly because of its emphasis on customers and stakeholders and its practical method of integrated product teams (IPTs). Thus, acquisition reform can be instrumental in resolving differences in requirements and perspectives, such as harmonizing joint requirements for the advanced concept technology demonstration project to "translate" messages between the U.S. Army and U.S. Marine Corps variable message format, and the U.S. Air Force and U.S. Navy Link 16 data transmission system. The four Services met and devised (with some difficulty) an initial set of

messages to be so "translated." Similar efforts are under way for ICRADs (e.g., ICOGs). Of course, multinational programs with European partners have historically used steering committees to reach mutually acceptable agreements addressing problems and opportunities. The lesson to be learned is that stakeholders tend to buy in when they were part of the decision and party to the process.

Correspondingly, total quality management/leadership (TQM/TQL) has failed, at least in some commands, because not all levels of management bought into it. In a particular systems command, for instance, the commanding officer pushed it, and many workers bought in and joined numerous process action teams. While some improvements were implemented, TQL never entered the culture because mid-level management never accepted it. Leaving primary stakeholders out of the process inhibits its effectiveness and longevity. The ultimate success of ICOGs and ICRADs depends on across-the-board acceptance from all major players at various levels within DoD. The Quadrennial Defense Review's creation of an international cooperative task force or the creation of the Armaments Cooperation Steering Committee will not, in and of itself, accomplish any more than the cooperative opportunities documents.

The fact that Jacques Gansler, who chaired the Defense Science Board study (1996), has become Under Secretary of Defense (Acquisition and Technology) (USD[A&T]) appears to be a good sign for both acquisition reform and cooperation. As Pritchett (1993) emphasizes, top-level support is essential for culture change. This includes top-level requirements people as well. The Joint Chiefs of Staff (JCS), the commanders in chief, and Service requirements personnel establish the out-year needs to be cooperatively met. At present, JCS support seems lukewarm and the commanders in chief have evidently not been players at all.

Stating a need for cooperative programs and coalition warfare in the *National Military Strategy of the U.S.A.* (Shalikashuiti, 1997) and *Joint Vision 2010* (Shalikashuili, 1997) is not comparable to active support by the Atlantic Commander or Supreme (NATO) Commander, Atlantic. The Atlantic Commander and European Command (a U.S. commander in chief), with vested interests in NATO coalition warfare, are prime candidates for support. Larger programs need early, high-level endorsement. MIDS, for instance, benefited substantially from strong USD(A&T) support. In addition, as the U.S. national armaments director, he is positioned to influence high-level Europeans to open doors, leading to fruitful lower level contacts between nations.

"Ensuring that the warfighter receives maintainable and supportable systems is the goal of LT&E."

But, OSD/JCS support has not guaranteed success. MEADS, for instance, has barely survived despite Congressional and OSD support. A truly successful program needs a solid Service requirement to be an unqualified success. MIDS has succeeded (despite the U.S. Air Force pull-out early in the program) only because of the F/A–18's need for it. With the eventual phaseout of the F–14, the F/A–18 will be a carrier's *only* fighter and attack aircraft. Nothing beats a real need. Thus, ICOGs emphasize primary versus

marginal requirements for new ICRADs. Groups such as the Navy's Requirements and Resources Review Board (advising the Chief of Naval Operations on POMs) should be tied into the ICRAD development process.

Of course, a joint, cooperative program, while more complex, provides additional, potential advocates for the program and identifies parallel requirements. Should some end, the program may still survive (as did MIDS). Such programs may also receive additional OSD support and funding. Since the DoD infrastructure "tends to ignore MOUs," it's important to "get the Three Stars involved in the process before the MOU is signed." Since Service priorities are often the opposite of the DoDD 5000 priority list, cooperative benefits to the Services must be highlighted to avoid future Service funding cuts. Milestone Decision Authority (MDA) support is essential for any program, but since MOUs can be political footballs (with politics overriding business sense), Service support (both requirements and acquisition) is quintessential for ICRADs. In addition, MDA-granted waivers should be achieved prior to signing an MOU.

True success, however, may depend on getting policy, requirements, and acquisition to gel, simultaneously incentivized for success. Then partnerships of "yes-sayers" can check the usual herds of naysayers. Figure 3 depicts a force-field analysis in which to prioritize efforts to enlist stakeholder support, considering their initial position regarding ICRADs and their

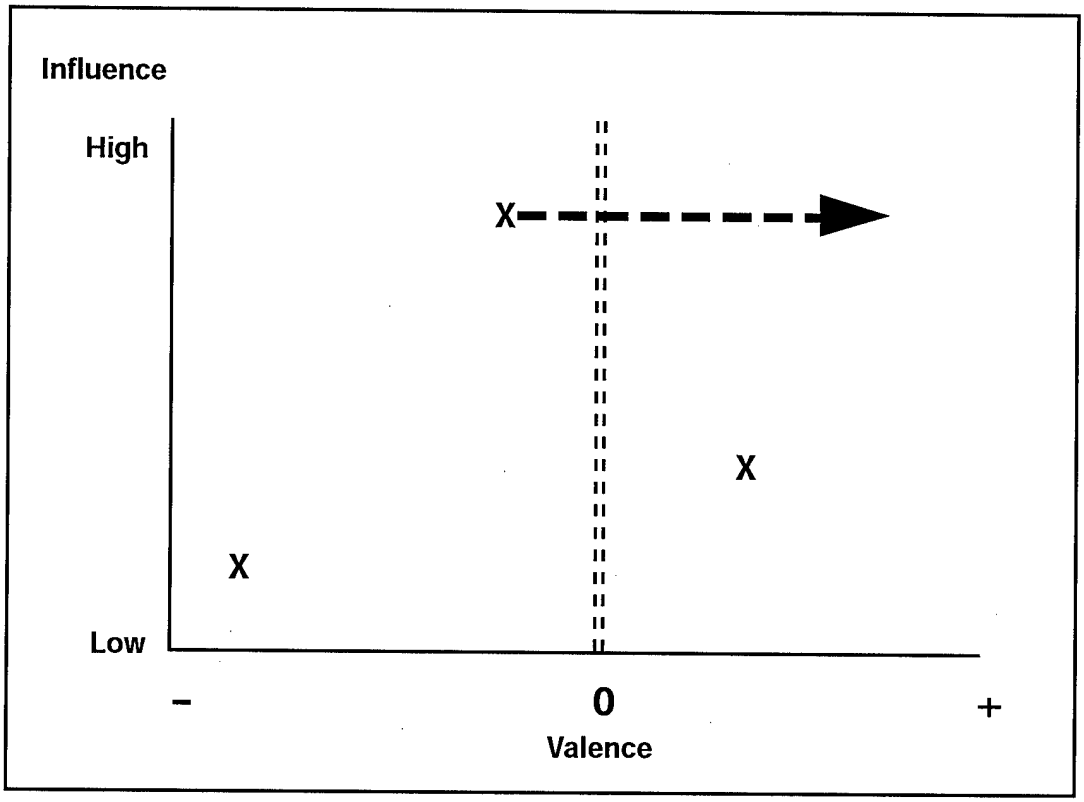


Figure 3. Stakeholder Force-Field Analysis

influence level. The "X" with the arrow is a stakeholder with high influence and slightly negative valence—slightly opposed to a cooperative proposal—presenting the best cost-benefit ratio for one's efforts to gain support for a cooperative approach.

With trust always a major issue, personal contacts are important and effective, since "familiarity breeds credibility." International Overarching IPTs (OIPTs) must be extended to ICRADs and could include appropriate State and Commerce department members. It's better than "going to war with the State Department."

Definition of Requirements

A cooperative requirements phase is absolutely necessary before beginning development or signing an MOU. In addition, a solid Service(s) mission need should be well established before negotiating cooperative requirements. A signed operational requirements document (ORD) (with Joint Requirements and Oversight Council and Joint Requirements Board support) and threat assessment are highly recommended as well. A NATO staff requirement or Military Operational Requirement can also be quite valuable. Optimally, the program can be linked to commander-in-chief regional strategies, *Joint Vision 2010* (Shalikashvili, 1997), the *National Military Strategy of the U.S.A.* (Shalikashuili, 1997), the DoD international strategic plan, and especially, Systems Command and program executive office business plans and budgets. More specifically, the planning horizon must be appropriate, allowing enough time for MOU negotiations as well as international program development.

Prospective participants must have a common need, not only of technical specifications, but also of need dates, and acceptable system maturity and risk. While interfaces and protocols are priority issues, platform integration should be excluded from common efforts. The goal is a set of mutually acceptable, fully harmonized and rationalized, functional performance specifications versus a target equipment design.

As much acquisition reform as possible should be incorporated (e.g., commercial specifications or NATO standardization agreements versus mil-specs or standards). While commercialization is new to some countries, most are familiar with ISO 9000/1, a usable base-line for the introduction of commercial parts and specifications.

Successful harmonization depends on securing a proactive advocate for cooperation and sensitivity to foreign partners' perspectives and concerns.

- "Don't try to force things down NATO's throat." It is wise to use written definitions, consistent terminology, and sensitivity analyses to refine requirements and avoid gold plating.

- "Clarity, stability, and mutual understanding of project requirements were considered to be of paramount importance" (Kwatnoski, 1995). Explain and persuade; "I need it" doesn't work.

- "The perception of the threat varies from nation to nation" (Defense Science Board, 1996). While the United States targets the entire world environment including extreme climates (Farr, 1985), Europeans have

narrower environmental requirements. Furthermore, the United States tends to undertake riskier programs, and partners often differ greatly in technical capacity.

- Don't try "too hard to look for one solution to satisfy all requirements" (*Business Week*, 1997). "[Since] you can't give orders to other countries, avoid a dictatorial approach, get consensus." Be aware of nationalism, sovereignty issues, and personal pride.

The fight for commonality is a long process. While "there's a lot of advantages in being the biggest and the best," a flexible approach is likely to have the most success, especially considering differences in language, perspectives, and terminology. Keep the team focused on identifying similarities and differences; avoid getting sidetracked by support functions and specialist views. Only a generalist approach is appropriate for trading off amongst specialty desires or needs.

"When walking through the issues to determine the hard spots, look for unknown disagreements..."

Since costs must be evaluated against requirements, prioritization is essential. Operating and acquisition community views must both be considered in order to achieve a program that adequately satisfies common needs but is also a "doable do" as far as implementation. Understanding the cost impact of specific requirements often greatly facilitates resolution of differences. Goals versus thresholds can be useful, especially considering that eventually the acquisition program baseline will contain these as well as cost as an independent variable, schedule, technical, and other requirements. When examining the issues to determine the hard spots, look for unknown disagreements ("what we don't know that we don't know," á la the Johari Window [Mink, Schultz, and Mink, 1979]) as well as "conflicts of agreement" (Harvey, 1988). It's better to identify problems early ("pay me now or pay me later").

It's easier to do one issue at a time. Historically, many problems arise because of a lack of understanding. Simplify the problem in a "horsy-ducky way"—when you see it, you understand it. Perceptions are important; they define reality. Don't confuse nonrational approaches with irrational ones. Different nations have different Myers-Briggs personality type indicator preferences (Pollock, 1995), and approach problems and solutions differently. It helps to sincerely try to understand why a nation wants a particular requirement. "Ninety percent of problems vanished once they were understood; get outside experts for the other 10 percent." Mitre, for instance, was quite helpful in resolving problems, and some other countries also have federally funded R&D centers.

Some of the overall cost savings of cooperative programs go toward delivery of certain requirements that particular nations don't need. The prime rule of systems engineering is: "Optimizing the whole de-optimizes the parts; optimizing the parts de-optimizes the whole." Work to optimize the whole.

Enthusiastic discussions and brainstorming are ideal, but avoid heated arguments. One may have to resort to higher level leadership to get unstuck. Project

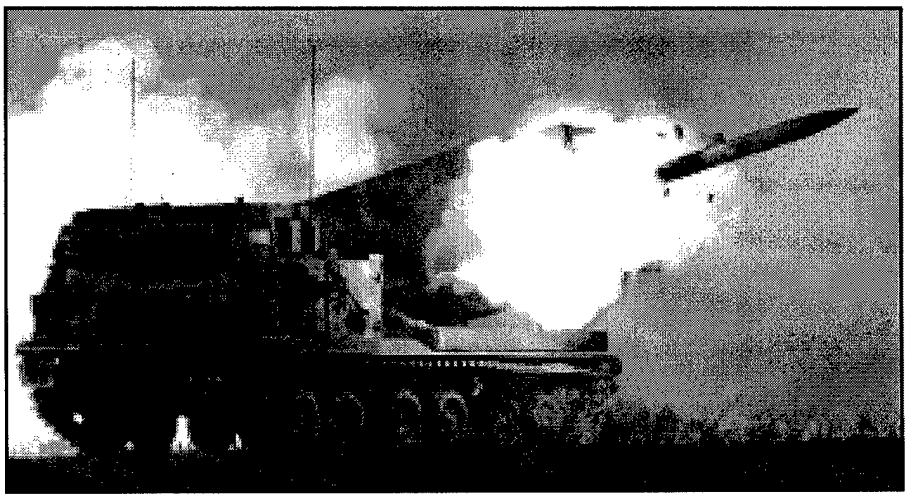
definition and the validation phase cannot be completed until the draft is endorsed at home; one may be forced to back off on an issue when it's staffed. Also, a solid, projected cost and schedule will be needed before participants can commit to the project. Be prepared to introduce wedges into the POM as soon as practicable. If possible, investigate the existence of possible competing programs or engineering changes, especially "black" ones: These have eliminated several promising cooperative efforts (e.g., the Multiple-Launch Rocket System (MLRS) terminally guided warhead) in the past. Avoid late joiners who can and will destroy prior harmonization agreements, and "be willing to be fired a few times!"

Relations With Foreign Personnel and Governments

"Everybody sees the elephant differently." Understanding another culture is extraordinarily useful when working on international programs. "A nod may mean 'I hear you,' not 'I agree with you' (SAM II History, 1996). Some cultures put the bad news first, some last. Extroverts tend to think out loud, introverts do not. There are large cultural differences between us and even our closest NATO allies. For instance, an informal study indicated stereotypical norms for the United States (ESTJ), Germany (ISTJ), and France (INFP). (Pollock, 1995)

For those readers not familiar with the Myers-Briggs Type Indicator™, commonly referred to as MBTI™, this personality profile captures preferences of individuals for how they focus their attention, the ways they like to receive information and make their decisions, and the lifestyles they adopt. Many groups of individuals in a profession, such as engineers, share the same code letters and traits. Some large groups like countries even share similar traits. The terminology is as follows: I = Introvert; E = Extrovert; S = Sensing; N = iNtuitive; T = Thinking; F = Feeling; J = Judging; P = Perceptive (Briggs-Myers & McCaulley, 1985).

Sensitivity to and respect for such cultural differences can greatly facilitate communications and problem solving.



Official DoD photo.

The Multiple-Launch Rocket System (MLRS)

Indeed, at higher levels of complexity and ambiguity, a collegial atmosphere works best (Jacobs and Jacques, 1986), because it minimizes the impact of cultural differences. These differences may influence something as basic as a meeting agenda: For example, Europeans may save the important items until last or revisit them at the end of a meeting. Some Americans view this as a negotiation tactic. It is extremely dangerous to project intentions onto a person from a different culture. All too often, we rationalize and fail to analyze our own intentions. As Farr states (1985), "there are too few internationalists who can think with the other guy's hat on."

"Negotiators, steering committee members, IPO representatives, managers, executives, and politicians are constantly changing."

Management styles are almost antithetical between Americans and Europeans. The Europeans generally commit funding for the life of the program, do not need to continually defend it, demonstrate patience, and use a macro-management approach. The United States generally commits funds annually (and doesn't necessarily support the profile for even a year), constantly has to defend the program to numerous decision authorities (management, financial, contractual, etc.), constantly revisits all program parameters (cost, schedule, performance, and operability), and micro-manages.

Administrative differences also abound, from U.S. reliance on e-mail (and the push for the paperless office) to the use of 8 1/2 x 11" paper. Not all allies have e-mail, and many use A4 paper. The latter considerably complicates faxes. Faxes are heavily used, especially due to time zone differences. When the MIDS program office was moved as a result of the Base Realignment And Closure (BRAC) Act to San Diego, the Europeans faced a 9-hour time difference for phone calls with International Program Office (IPO) personnel. This greatly limited the daily amount of phone time available.

Despite the many differences, our allies are, first and foremost, people. Thus, it is best to build on shared motivations and demonstrate commitment to high ethical standards (honoring commitments and avoiding end runs). Be prepared for items to move slowly, if only because of the number of communications links (which increase exponentially with the number of participants). Parallel processing often helps, once a reasonable level of trust has been established. Allies do not understand the U.S. acquisition system (a moving target even to experienced acquisition professionals), just as we do not understand theirs. Be prepared to educate newcomers as required.

Negotiators, steering committee members, IPO representatives, managers, executives, and politicians are constantly changing. Their military members "rotate" just as ours do. The cadre of players is continually evolving no matter what stage a program is in. New players carry their personal as well as cultural backgrounds, experience base, values, assumptions, sense of time, and procedures with them. To bridge differences, it is often helpful to identify items that affect others similarly, such as the globalization of industry, declining military budgets, and OOTW.

When there are definite differences in acquisition policy or culture, it helps to

explain what the effect is upon you as well as upon them. For instance, U.S. acquisition reform and BRAC can be understood better when the U.S. representative points out how the changes have affected or are expected to affect him or her—not just how the NATO listener will be affected. Assuming someone will see the light may leave you in the dark.

Typical American View of Cooperative Allies

"We have more in common with fellow Services in Europe than with other U.S. Services!" This can make a bilateral, same-Service ICRAD very palatable. The U.S. Navy, for instance, has numerous bilaterals (e.g., Trimarran, cooperative outboard logistics upgrade, and surface ship torpedo defense) with the British Admiralty.

On the other hand, there is much chafing in these overseas relationships. The British are known as hard bargainers. Complaints range from the $6 price of a beer in Norway to European block voting. Sometimes European behavior is viewed as offensive (but American behavior is as well). Europeans do not understand the United States' need for flexible schedules and costs or the need for competition (Europe is truly the home of the military-industrial complex, where sole source is a way of life). It is difficult to create a competitive transatlantic consortium when each partner names the source for its country's work share. Only the U.S. portion of the contract is then competed. Other barriers to cooperation include security restrictions on communications with allies (originating from the Defense Intelligence Agency or the National Security Agency, as appropriate, prior to discussions), and "the automatic perception by some that U.S. technology is way ahead of Europe." It's difficult to cooperate when the United States "wants to stay ahead of everyone else." Such attitudes can extrapolate into a "we develop, you buy mentality" hardly conducive to cooperative development or even to coalition warfare (Farr, 1985).

Typical Allied View of Cooperative Americans

To potential cooperative partners, "having the United States is a great prize but difficult to work with; rigid." Many of the complaints concern the U.S. political system: "The United States has the Buy America Act; there is no Buy British Act." "The United States is reluctant to depend on allies, but wants allies to depend on the United States." Further, the United States imposes extra-territoriality (e.g., no allied trade with Cuba and restricted sales of high technology to South America) to the detriment of allies. Also resented is U.S. arrogance about being the best, and its bad case of the not-invented-here syndrome. Thus, the United States is viewed as protectionist (two items that often arise are certain types of ball bearings and textiles).

"Rather than trying to force something down NATO's throat, the United States could seek to understand NATO goals."

It might help if the United States opened the North American Free Trade Act to Europe. The Western European Union may act to counter U.S. protectionism. Europeans "want to avoid a one-way

superhighway of sales to Europe versus true partnership" (Farr, 1985) and avoid "a country lane going west and a superhighway going east" (Abbott, 1997). The Defense Security Cooperation Agency (DSCA) is seen as promoting U.S. exports via foreign military sales, which is viewed "like Japan dumping cars in the United States." This parallels a perceived attitude that "if it's good for the United States, it's good for NATO." The United States needs better credibility as an honest broker. Rather than trying to force something down NATO's throat, the United States could seek to understand NATO goals.

Loyalty to one's country is often viewed as "nonparochial." Work share and offsets are viewed as strengthening a nation's industry and economic base, which are essential for a strong military. French rivalry with the United States is based upon similar ambitions; she sees herself in direct competition with the United States as the European defense technology leader.

"To offset these perceptions when dealing with allies, the United States must exhibit a cooperative attitude instead of a nationalistic, self-important, or superior one"

But much of the difficulty concerns differences exacerbated by the lack of international experience of U.S. personnel. Indeed, the United States, it is said, "has a teenager viewpoint." The United States wants total defense capability across the spectrum, wants the allies to help pay for it, and wants continual upgrades (e.g., the F–16)—forcing allies to spend more or become incompatible. "It's inefficient for the United States to seek dominance in everything."

Furthermore, the U.S. acquisition system gets its share of complaints. "The U.S. system is full of lawyers" (and has a regulatory mindset); requests for proposal (RFPs) allow only 60–90 days for contractors to respond, but it takes the U.S. State Department 60 days to release the RFP to allied bidders; the United States presents a veto problem for third party sales; and cooperative efforts get "ambushed by the many," a reference to the large number of players in the U.S. approval process (Kwatnoski, 1995).

To offset these perceptions when dealing with allies, the United States must exhibit a cooperative attitude instead of a nationalistic, self-important, or superior one. The United States' widely broadcast exuberance over becoming "the only superpower" reminds one of the fans at a ball game chanting "We're number one!" When the United States unilaterally cancels cooperative programs, replacing them with national ones (e.g., brilliant anti-armor submunition), France needs no excuse to leave MEADS and pursue its own national program. It's little wonder that Kwatnoski's survey (1995) found allies stressing trust and commitment, but Americans not (similar to Farr's findings [1985] on European versus American commitment). Nevertheless, recent military down-sizing, industrial consolidation, and other trends provide an opportunity to increase understanding, cooperation, and competition. For instance, it was noted that "the Atlantic is narrower than the English Channel in some respects," and that "it serves no purpose to protect companies that are basically noncompetitive" (American Defense Preparedness

Association, 1997). But international competition must also be open and reciprocal to be politically defensible.

Memorandum of Understanding Development

An MOU, from first draft to final signature, can take anywhere from 2 months (minimum according to the NIPO) to 26 years (maximum according to the Defense Systems Management College). A reasonable planning estimate is probably about 2 years, though there are new procedures to accelerate this process. Prior execution of a DEA amongst the partner nations can greatly facilitate this process. Before beginning, the requirement should have been defined and harmonized, the participating nations' representatives identified, and the type of agreement determined. These representatives (principals) either will form or represent a steering committee (SC).

Generally, technical discussions take place prior to formal negotiations. These discussions cannot decide anything and cannot draft MOU language, since these responsibilities are reserved for designated negotiators (such as those in the NIPO). However, principles of cooperation (POC) are defined during technical discussions, which are the basic approaches underlying the resulting MOU. While not binding on the negotiators, they serve as guidelines for negotiation. They should have a consistent thrust, forming a "thread through the document more important than the exact words of the text." Usually the POC are written in the form of a list, worded in a nonbinding manner: "The participants intend (or seek) to...." They are often drafted by program personnel.

The basic structure must also be chosen. Many MOUs are written as stand-alone documents addressing an individual program phase (e.g., engineering and manufacturing development), although paragraphs from prior phase MOUs may be incorporated by reference. There are, however, alternatives. Program MOUs (PMOUs) provide a standard framework for the life of the program with supplements specific to each program phase. The initial supplement is negotiated with the PMOU. Thereafter, only phase-specific issues need be negotiated for later supplements or phases. More recently, technical R&D projects have been instituted with country umbrella agreements and project annexes. These annexes can take half the time of a regular MOU, and their small, early R&D projects can be delegated to the SC for signature.

"'Many MOUs are written as stand-alone documents addressing an individual program phase (e.g., engineering and manufacturing development)...'"

MOUs for larger programs may be signed by the national armaments director of each nation: In the United States, this is the USD(A&T), but signature authority can be delegated to service acquisition executives for smaller programs. The DoD international agreements generator (IAG) software program (developed by the NIPO) is available to MOU authors. The executive secretary of the SC may compose the first draft using the IAG and POC. The NATO Group on Acquisition Practices (AC313) has promulgated

"Guidelines and Sample Provisions for Memoranda of Understanding," containing language similar to the IAG. The IAG contains actual paragraph wording for MOUs with numerous alternatives included. The Defense Systems Management College program manager T304 course (Advanced International Management Workshop or AIMW) trains personnel to write and negotiate MOUs; it is highly recommended. Service experts (such as NIPO) can provide prior MOUs and information on the latest options (e.g., the joint strike fighter's core master agreement approach). While prior MOUs can be quite helpful, they have already been negotiated and, therefore, are not well constituted as going-in or opening positions, since they are already reflective of compromise.

"'Lawyers are important but the programmanager must lead and set the tone.'"

Prior to negotiations for the initial draft MOU (for an R&D project), a summary statement of intent (SSOI) must be formulated, submitted, and approved. The SSOI generates, hopefully, authority to negotiate that is formally approved and forwarded to the U.S. principal. Service specialists run interference for the approval process, but one must communicate the nature of the project to them so that the right people are assigned to the project. They also lead or staff the negotiations delegation (including legal experts), along with the principal's technical representatives. Thus, it is necessary to explain the unique nature of the project to the MOU specialists, for which a mutually supportive and well-coordinated IPT is ideal. Vision, goals, and objectives can then be shared and refined. The United States' going-in position and ranges of acceptable outcomes can then be devised. "Lawyers are important but the program manager must lead and set the tone." "Lawyers want rigid structure, but you need flexibility to adapt to changes; funding per year can't be fixed." But "One word crafted by a lawyer is worth a thousand pictures." In any case, MOU experts serve as "your encyclopedia." It might also be helpful to peruse the DUSD(I&CP) *International Armaments Cooperation Handbook* (1996) for a process overview.

MOU Content

Regarding the initial draft, a balance must be struck between a strong opening position and what can fly. An unrealistic starting point not only slows down negotiations, but detracts from credibility and a perception of equability (a U.S. statutory requirement). Use consistent terminology and provide written definitions, and try to avoid multilingual documents—language certification can cause delays and misunderstandings. Create a Rich Text Format file as well as a word processor file and maintain them on diskettes, use the "Keep it simple, stupid" (KISS) principle, and "wallow in the document." Obtain an OSD cheerleader who can facilitate the entire process and be a program advocate—especially if the program is or may become joint. According to a number of those interviewed, the big five challenges are: management structure, finance (including cost share), contracting (including work share), information disclosure (and use), and third party sales

and transfers. But any area can present problems with a particular nation. Most important, extrapolate results of any agreement: "Those who write the MOU don't have to execute it." Use authority responsibly. Use the Porridge Principle: neither too hot nor too cold (not too vague, not too detailed).

Depending upon the size of the program and the particular nations (and number) involved, an SC will oversee the program (a principal and deputy per nation), supported by an IPO. Usually, the United States serves as host nation (providing nonreimbursed support, the SC chair, program manager, and executive secretary), with the IPO (including international representatives) located in the United States. This is optimal for efficiency if the overhead is affordable. Avoid overly predefining positions to be occupied later by internationals (other than the deputy program manager), since they will probably be unfamiliar with the U.S. acquisition system.

In most programs, each nation gets one vote and all votes must be unanimous. This provides veto power, which can be highly detrimental in certain cases, especially if used as a threat. In some cases (e.g., Sea Gnat), however, voting situations have been divided into classes with some critical areas retaining the veto and others being decided proportionally (e.g., by cost share). Since the United States often provides a disproportionate share of the funds (more than 40 percent for some large projects), this is highly desirable.

Configuration management (including software maintenance) is also an important issue since interoperability is a major ICRAD advantage. Authority can be vested in the IPO and SC as appropriate. The program manager must have veto power over IPO appointments (though it must be used sparingly) and sufficient authority—don't strangle the program manager! Provide as much authority to the SC as possible. Often agreements can be relegated to subsidiary documents (such as the program management plan) controlled by the SC. Also, acceptable ranges can be preset, with the SC empowered to approve targets within the accepted range (similar to U.S. acquisition program baseline goals versus thresholds). It is very important to avoid later problems by defining program officials' responsibilities beforehand.

Payment in U.S. funds is important. The MIDS, for instance, had the nightmare of five currencies with bank accounts in each currency in each nation. The five subcontractors were paid in their own country's currency. There was a considerable price paid in terms of time delays, personnel, and overhead.

"Foreign industries are often not independent of governments, and true competition is often nonexistent."

Exchange and inflation rates also become challenges. Equitable cost sharing is subject to considerable interpretation. Europeans often wish to match each nation's projected off-take (number of equipment units to be delivered) percentage to their cost contribution. But many operating costs are not dependent on the number of units, and the host nation alone pays for many items. Some programs have devised a two-tier approach: Some cost items are shared equally and some are by off-take percentage. Of course, the MOU must define items by category.

In addition, a national versus common or shared cost category is necessary for items not desired by all participants. Engineering changes are a special case; some MOUs provide that only those nations requesting the change pay for the nonrecurring costs, but all nations pay the recurring costs. These approaches are theoretically satisfying, but caution is advised since not all nations are necessarily forthcoming or accurate regarding their projected off-take or desire for a specific engineering change.

Contracting is presently in a state of flux. U.S. acquisition reform efforts include new contractual agreements, such as use of commercial products and specifications, dual-use manufacturing, the single process initiative, and electronic data interchange. Not all potential partners, however, are familiar with, or capable of handling all of these innovations. Be prepared to explain and defend them. Foreign industries are often not independent of governments, and true competition is often nonexistent. International consortia are probably unavoidable, with most nations specifying their participating company.

"Third-party sales can be a thorny issue in production, although it is also included in engineering and manufaduring development MoUs."

Also, work share will indubitably be equal to cost share. However, it is highly recommended that error factors be used—that is, each share should have a range of acceptable values or an accepted percent of deviation (e.g., 20 percent). Also, while the SC will review the actual figures against targets, the prime contractor should allocate the work under the given guidelines. An award or incentive fee can be invoked to motivate compliance. If possible, have the prime contractor or integrator excluded from work share.

Assignment of specific assemblies or software can be a problem, since companies vary in abilities. Often, firms with less experience in an area will lobby to perform that task (as a technology transfer benefit; one of the main reasons foreign nations collaborate), which can add enormous technical, schedule, and cost risk. Be prepared to fight to have work share distributed on the basis of capability. "Work share is more art than science; get companies to work on it." A government-industry team may help.

The roles of the SC and IPO in contractor selection must be predefined. IPO reviewers will need the education necessary to fairly evaluate bidders in accordance with host nation laws and regulations. The SC should review IPO findings and recommendations, but should *not* have selection authority. The SC chair (the program executive officer) may be the selection authority, but the final decision may require higher-level (Milestone Decision Authority) review and approval. However, in some cases the participants choose to use NATO contracting rules or a NATO management agency, which greatly complicates matters.

"Foreign disclosure policy can be the long pole in the tent." Partners are just as interested in information as in hardware and software. Background information produced by a nation outside the program (usually prior to) can be used, if provided to principals or contractors, but not

released outside the program. This must be delineated in the MOU.

Foreground information (produced by the program) can generally be used by participants outside the program, but specific allowable uses can be specified. Government use property rights are becoming acceptable to collaborative partners. It is important to protect U.S. companies from losing control of their intellectual property rights. Legal personnel should assist here.

Third-party sales can be a thorny issue in production, although it is also included in engineering and manufacturing development MOUs. The United States generally insists on veto power in this area, though caveats (stating that a veto would not be invoked if the partner in question would sell a similar item to the target country itself) can be included. Unfortunately, the State Department reviews these on a case-by-case basis, and the countries on the no-sale list vary over time.

The United States is usually the only one to object to these sales, but not always. Embedding U.S. or cooperatively developed items into a foreign platform can detract significantly from their competitiveness. Swedish fighter sales were held hostage due to U.S. component export license requirements.

Indeed, one must run interference with the State Department for the shipment of collaborative components between partner nations for incorporation into the integrated product. Export licenses will be required. It is possible, however, to negotiate a blanket export agreement with the State Department before the fact. Service laboratories also must be coordinated; export licenses have been hampered in the past when a laboratory was asked to evaluate technology export unbeknownst to the program manager.

Some programs use a coordinating committee to control third-party requests. Such a group could function as an OIPT, with State and Commerce Department members, to facilitate approvals. Also, it may be possible to negotiate with State for a "quick look report" on proposed releases, consortia agreements, RFPs, or technical assistance agreements to speed up the process. Other possibilities include leasing and licensing (one example of this is the multiple launch rocket system for Japan).

MOU Negotiations

It pays to plan ahead. Find people with an international background and the necessary technical and management expertise, and line up a professional negotiator and lawyer. Get current data on each country's recent negotiations history and identify a solution in advance. Often, "if no one has an alternative, you win." The initial draft (with backup rationale) is the going-in position, but one should also prepare contingency plans, acceptable ranges of outcomes, and a "best alternative to a negotiated agreement" (Fisher and Ury, 1983). It helps if acquisition personnel have people and negotiation skills. "We can't afford potty training" for expensive programs: "Come equipped with the tools to do the job." A politically sensitive strategy must be devised and

"Everyone needs to feel they're part of the solution."

major strategy changes must be avoided. Rather than a group with divergent interests, one needs a small, coordinated team. The resulting "comprehensive vision" and coherent view, ready for an opportunity to open, "won the day time after time."

During negotiations (as in running an SC or IPO), attempt to establish mutual trust through personal relationships. Don't try to intimidate; "don't be Attila the Hun." Compromise as necessary. "Trust is a two-way street." "Everyone needs to feel they're part of the solution." Avoid being labeled "uncooperative." The United States usually provides administrative support. Beware of transmission problems (phones, facsimile, e-mail) and the limitations of the partners. Provide soft (electronic) copies so they can adjust the verbiage as needed. The goal is to "create a winnable program" for all the players. Scheduling sessions will be a continuing problem, so schedule them as far in advance as possible. Lack of continuity of negotiators, both foreign and American, will probably plague the process. It is recommended that sessions be held monthly. The number of sessions generally equals the number of countries.

"Don't get stuck, move on; seek later tradeoffs or unknown, evolving, integrative solutions."

It's best to divide the effort into "doable chunks" similar to evolutionary acquisition. Don't get stuck, move on; seek later tradeoffs or unknown, evolving, integrative solutions. For instance, funding or work share can be temporarily "fenced off" for later discussion. "Steer the language through terrain obstacles," and modify the principles of cooperation if necessary.

But do not revisit prior MOU agreements; times have changed and the climate differs. Partners may bring up every concession the United States ever made on any and all prior negotiations. So avoid setting new precedents for their later use: For example, don't go above the AWACS 41.5 percent cost share. Breaking new ground will have future consequences. Nonetheless, it may help to ask another nation to draft a proposal and then defend it. One then has buy-in and is not seen as the constant driver of the process. This technique often exposes heated differences as mere linguistic difficulties. When another country proposes verbiage that seems identical to what the United States previously proposed, *never* say "that's what we said before." Just thank them for clarifying the issue. Most of all, don't lose sight of the goal.

MOU Approval

Kwatnoski (1995) noted that "nearly all the U.S. project offices identified the cumbersome MOU-MOA (Memorandum of Agreement) process as a barrier to cooperation, including complaints about staff coordination differences and the time it took." Times are often significantly underestimated, especially when higher level changes necessitate reopening negotiations. Reviewers have their own agendas. DSCA, with a vested interest in foreign military sales versus ICRADs, can harm a program (the MLRS suffered this fate).

Similarly, the Defense Threat Reduction Agency, the National Security

Agency, and the Departments of Commerce and State will also review the MOU, greatly lengthening the process. Preprocessing choreography can provide an ounce of prevention, however. Unfortunately, acquisition reform has not yet improved the chop review cycle much, except in OSD, where the average review time has significantly declined. Beware that "sometimes the wrong people are staffing the problem." A silence procedure is needed for all parties concerned, and an OIPT could be very useful as well.

Finally, don't negotiate if a program doesn't have a pressing Service need and is already in the POM—if not in the Future (formerly Five) Year Defense Plan.

Steering Committee Operations

SC membership is somewhat enigmatic. Sometimes the U.S. member will have the highest rank and the smallest authority. Most other nations have much smaller bureaucracies and avoid micromanagement. Hopefully, the MOU will apportion considerable authority to the SC. The U.S. member should have at least as high a rank as the other members, despite the fact that one cannot control who else serves on the SC, and "everybody wants to come to the United States." Assuming the MOU appoints the United States as the host nation, the SC will normally elect the U.S. representative to chair the SC. In most circumstances, majority does not rule; each nation has veto power. Therefore, the chair needs finely honed people skills or it "may take forever to do anything." Especially avoid going in "with extra baggage, stereotypes, or prejudices." Rather, "be prepared to listen and learn; be open minded; have fun."

International experience and negotiation skills can help minimize politics and maintain a professional atmosphere. It's important to establish a culture of cooperative problem solving rather than one of competition, so that all members feel they are full participants. Familiarity can breed mutual respect. Experience with group dynamics can help the chairperson establish a collegial partnership (Jacobs and Jacques, 1986) in which the members support each other and feel safe enough to openly express their nation's core concerns and issues. Similarly, the chair needs to work the external environment well (i.e., public relations) for continued support of the program. Strangely, to obtain a uniform SC vision, the chair must understand the many cultural, personal, time sense, and technological differences. For instance, the technical to management ratio of SC members may vary considerably. International team building is a challenge.

"In most circumstances, majority does not rule; each nation has veto power."

The one team member that the chair can appoint is the executive secretary (ES), who administers SC operations. This position is important since "he who writes the results of the meeting determines its outcome." Also, the ES prepares the agenda, which should be pertinent to the program and avoid extraneous issues. Succinct minutes should include attendee list, action items, agreements, slides not available for handout at the meeting, and

Steering Committee Meeting Checklist

I. Before the meeting (United States as host)

A. Correspondence
1. Read-ahead package: Agenda, preparation items; prior action items; location and room
   a. Avoid acronyms; date and number pages or identify same as ahead package
   b. Make extra copies for duplication into meeting handout packages
2. Attendance list for meeting
3. Security clearances (if meeting is classified, need foreign visitor request forms)

B. Reception planning
1. Reception attendance list, including contractors
2. Official representation funds (ORF) request letter
3. Location choice, deposit, reservation
4. Cost analysis and distribution
5. Invitations: Write and send; contribution addendum?
6. Contractor reception? U.S. attendees?

C. Presentations: Transparencies and hard copies
1. Current action items with spaces for additions
2. PEO pitch: Avoid acronyms and idioms; prepare a bio and introduction for any new participants
3. IPO pitches and read-ahead items; MIDSCO?

D. Room selection: Consider number of participants when chosing size and shape
1. Arrangement of furniture (including coffee table): in back and near door

II. For the meeting (prepare just beforehand)

A. Handouts (take-along packages): Avoid acronyms and idioms
1. Looseleaf books with decal markings and members' names
   a. Numbered dividers matching the agenda
   b. Inserts: Agenda, table of contents, current action items with blank spaces
   c. Read-ahead package updates and additions: Reports, pitches with date and page number
   d. Appendices if required
2. Welcome packages: Maps, brochures, metro information
3. Sign-in sheets ("please print") with headers and latest data on members

B. Security
1. Foreign visitor request forms (to host activity security office)
2. Pre-made badges (visitor control office)
3. Escorts for foreign guests

C. Room setup
1. National flags, participant placement
2. Numbers of chairs at table and against wall; arrangement of furniture
3. Coffee, pot, filters, cups: location in relation to tables, doors
4. Doughnuts, cookies, and cold drinks (for the afternoon)
5. Vu-Graph machine, screen, blank, elex slides, marker pens, MOU, pointer
6. Calculator, computer, printer, MOU, elex slides, power availability
7. Blank slides and slide markers; pointer

III. At the meeting: Action items, decisions, cleanup (coffee pot, etc., at end of each day)

IV. After the meeting: Minutes, attendance list, AIs, next meeting time and location, decisions

little else. Other items are generally "a waste of time and money."

The ES must be sensitive to time differences between the U.S. coasts and the foreign members. Opportunities for phone calls and video teleconferencing are limited, and Federal Express deliveries to specific individuals within other countries can be elusive. Some principals may not have reliable e-mail, and posted mail takes forever. Thus, many programs rely on facsimiles. Sometimes members trade home phone numbers. It's important for the ES to provide signup sheets for each meeting, since numbers and titles change continually. These can be pre-printed with room for corrections. A sample checklist for host nation meetings is shown in the box on the following page.

Meetings held in other nations would require a subset of these actions, with added actions for area clearances and other issues. Some nations that require no visa for tourists do require one for those traveling on official passports. U.S. Embassy Offices of Defense Cooperation will usually make hotel registrations for official visitors (they get better rates). On some programs, the principals even put up visitors in their homes or have social events for the SC. Generally, the hosting nation (for a particular meeting) will host one social event for the principals, deputies, and sometimes other attendees. Welcome packages with local event, travel, and restaurant information are normally provided. The ES should verify what equipment (such as computers, word processors, printers, fax machines, and vugraphs) will be provided at the meeting.

The chair needs to "lead, not just run the meetings; to work the hard issues." To maintain a corporate perspective, the principal needs to strategize with group members: deputy SC member, program manager, and ES. Each may be asked to draft inputs for the meeting. Often one of the inherent costs of ICRADs is training the internationals—whether in the SC or IPO. While some of this is necessarily on-the-job-training, SC meetings should be used to "consider issues, not to inform the members." Read-ahead packages should be sent so that members are informed of details prior to the meeting. Though drafts may be sent ahead for review, always bring copies to hand out at the meeting. Important items can also be included in the minutes.

"While nations may play one principal off against the other, appreciate the differences."

The meeting itself should be run as a board of directors meeting, with a high level of abstraction. Technical issues can be delegated to a multinational management coordination group, under the program manager, which reports to the SC. The SC should also avoid micromanaging the program manager or the IPO. Both formality and the number of attendees should be limited (one program had 100 attendees!). Meetings can be broken into parts: principals-only sessions and plenary sessions. During the SC meeting, "Who speaks first matters. Know which countries have similar positions and arrange the order of speaking." It's best to go last. "If the United States votes first, [the other members] tend to vote against the United States." "Avoid flexing your muscles." Clearly identify and record open and closed issues and agreements. Above all,

avoid public infighting. If disagreements appear among U.S. attendees, call a recess.

The contractor should be invited to speak, but must avoid implying that he or she represents the United States. Europeans have much closer interrelationships with their contractors, and they may not realize the difference while listening to the contractor's report. The program manager should provide a government view of the contractor's performance. While nations may play one principal off against the other, appreciate the differences. "Differences don't equal right or wrong." And remember, "you gotta have fun!"

International Program Officer Operations

Many of the issues asynchronously confronting the SC chair synchronously confront the program manager, making it a frustrating full-time job. While "it's orders of magnitude more difficult to have an IPO than a major U.S. program," say program staff, "familiarity breeds appreciation." For small programs, added costs may not justify an IPO, but there's a huge difference between "an integrated office versus token representatives." An IPO can bring "a sense of family" to a program. The program manager can promote this climate by showing "loyalty to the project versus your country [to] promote allegiance from others." If successful, "you don't hear their accents anymore" (Klisch, 1997).

"Conversion rates can affect overruns and losses and add risk to funding profiles."

Technical Issues

While DEAs rarely lead to MOUs (one did for Trimarran), DEAs are recommended while a program is becoming a reality and even after the MOU is signed. They provide a convenient way to communicate. Furthermore, personnel gain valuable international on-the-job training. Similarly, the Engineer and Scientist Exchange Program and international military exchange training can provide personnel experienced in working with allies on technical and operational issues. Prior to MOU approval, personnel should finalize technical requirements (see above) and translate them into working-level documents. Most especially, the interface control documents must be collaboratively generated. Be aware that technology transfer issues may be more difficult than envisioned. Use of U.S. laboratories may be limited to host nation support unless foreign laboratories can provide balancing support (and an independent view). Use of support contractors and federally funded R&D centers may also be limited because of funding. IPO operations can be streamlined through electronic media and other acquisition reform measures.

Financial Issues

As in all programs, funding continuity is a challenge in the United States. With several cash flows (from different countries) to manage, ICRADs do increase the financial manager's burden. As stated above, funding is more solid if based on a core Service requirement. "Service people don't care that you have an international MOU; they only care about their pet projects." One program had its Service funds pulled 2 days before the MOU was signed. If Nunn funds, for example, are

used to start a program without strong support, future funding streams are imperiled.

Even with strong DoD and Congressional support, programs such as the mobile extended air defense system have had rocky financial pictures. Nunn funds are usually provided for only 2 years and must be spent in the United States. Program funds (especially for joint programs) are sometimes funded by DoD versus the Services (e.g., MIDS terminal), which can help to fence funding lines. As always, the program manager and program executive officer must be strong program advocates to maintain program continuity. Having a discrete reserve or engineering change proposal account is highly advisable.

Antithetically, foreign funding is much more stable—but foreign funds have their own problems. Conversion rates can affect overruns and losses and add risk to funding profiles. De-escalation indices are very difficult to negotiate if they are not pre-set in the MOU. Business, accounting conventions, and tax structures all can differ. All known national budget processes are out of phase with the United States' October 1 fiscal year starting date and planning, programming, and budgeting system cycles, and "the normal U.S. system does not accommodate international transactions well."

It's best to get payment in dollars, but if that is not possible, get an internationally experienced bank or accounting firm to handle financial transactions and currency conversions. It can also help to have the nations send funds directly to the contractor. Many countries (Britain among them) are much more flexible at exporting funds, but in the United States, it is "hard to send money overseas." As an alternative, the United States can provide test gear or used equipment or other items to avoid sending dollars abroad.

The financial manager will need to follow up on deposits and expenditures—don't assume they will occur as planned. Beware that large checks can sometimes appear in the mail—with your name on them! A financial manager in each nation may be needed to help develop methods to tailor standard procedures in each country. An SC-approved financial procedures document can provide continuity of method over the life of a program. Of course, the size (ACAT) of the program will dictate how elaborate procedures need to be. Remember, however, that "losing money doesn't take any great skill—anybody can lose money."

"When obligating and expending funds, it's important to differentiate between common, host nation, and national costs."

When obligating and expending funds, it's important to differentiate between common, host nation, and national costs. Make sure checks are made out right and not lost. The system is bureaucratic, but not automatic. Foreign funds may be designated "operations and maintenance" or "production," but the usual rules (e.g., expiration dates) do not apply. Comptroller personnel may need to be reminded of this peculiarity. While the United States obligates funds, then pays when billed by the contractor, other countries may have a work-first, get-paid-later, or a pay-bills-up-front approach. Such differences should be accommodated in the financial procedures document. It can also be used to institutionalize contingencies for

inflation, unit cost changes, or unit volume changes. Differences in fiscal years can sometimes be used to add flexibility to funding and cash flow. Using work-share banding for contractors and field activities can increase vital flexibility which may become critical, since getting useful cost-schedule reporting data can be a tremendous—and expensive—challenge. On the bright side, "no one looks at non-U.S. funds in the DAES [Defense Acquisition Executive Summary, an ACAT I report to DoD] report."

Contractual Issues

While it's best to have a real prime contractor with experience (e.g., Hughes for the evolved Sea Sparrow missile), many programs end up with a unique consortium (e.g., MIDSCO for the multifunctional information distribution system (MIDS) Consortium Organization. Contractually, pure competition obtains the best price, but the nations will want to divide up work share among a selected group (usually one company per country). It may be possible, however, to have competing primes enlist their own subcontractors within the partner countries. Indeed, a particular company can be split up by a "Chinese Wall" so that different divisions join different transatlantic teams without sharing bidding information. To better accomplish this, MEADS formed "transatlantic international entities." Of course, losing bidders may mean losing some of the best subcontractors, but this is just as true in domestic team bids.

"Most important is to 'create an environment the contractor can win in;' and avoid close supervision and continual 'help'..."

Rigid work-share percentages preclude needed flexibility and are unrealistic considering the vagaries of time and programs. It's best to provide the prime contractor with subcontracting flexibility and empowerment to ensure that a work-share target (within specified bounds) is achieved. An award or incentive fee can be imposed. "Assigning work is dicey." Care must be taken that performers have the capability and expertise to efficiently and effectively perform the tasks assigned them. They should not receive work merely because they desire it.

Europeans usually employ fixed-price contracts; their budget system reflects this. U.S. cost-plus contracts present a major risk if not understood. Cost schedule reporting, design to cost, and life-cycle cost may be unfamiliar concepts as well.

Protest mechanisms (e.g., by the General Accounting Office) should be delineated prior to issuing the solicitation. Acquisition reform efforts, such as commercialization, can somewhat offset such problems and can lower risks. The many differences underscore the difficulty in obtaining foreign expertise in U.S. contracting. NATO contracting is possible, but seldom desirable. But the use of contract innovations can be quite helpful. Companies can establish facilities on foreign soil; international credit arrangements can be devised; or, perhaps, work share could be pooled in a group of projects or contracts.

Most important is to "create an environment the contractor can win in;" and avoid close supervision and continual "help" (like DoD sometimes receives from the legislature). For instance, allow the

prime to work out conversion and escalation rates with subs. Obtain exemptions, waivers, or deviations to help the program. Recent developments such as the McCain Amendment can help with the Buy America Act. Often there are ways to work around technical export restrictions, specialty metals clauses, and other regulatory difficulties. Unfortunately, despite the Administration's efforts, U.S. export license reviews remain a lengthy process. Learning curve delays, however, can be eased through out-sourcing, but keep support contractors to a minimum. It's difficult to get them (and even DoD laboratories) included as common (shared) costs. Issues should be resolved in the IPO if at all possible. Minimize issues passed up to the SC for resolution; otherwise expect significant time delays. A management coordination group can help resolve issues before this occurs.

Personnel Issues

IPOs require personnel who can handle more ambiguity (Jacobs and Jacques, 1986). One of the ways to lessen ambiguity is to define roles that people can "own," rather than having them merely serve as national liaisons. One can try to obtain experienced people to avoid much on-the-job-training, but it's "hard to find U.S. personnel qualified for cooperative programs, let alone European [personnel]." Despite MOU authorization to approve all IPO personnel, the program manager can reject but a few (at most) without creating unacceptable embarrassment.

The resulting group may demonstrate great variation in ability and training. Comments from participants are hardly enlightening: "Everybody wants to come to the United States so you can get their best people." "Only a few of them are willing to move to the United States; therefore, there are small selection possibilities." Still others say that because of the vagaries of politics, "they don't always send the best people." In addition, with smaller organizations, differences in levels of detail and abstraction between GS–13 and Senior Executive Service equivalents can be much less in other nations as can their use of consensus management. Despite off-take (number of units procured) and cost-share (amount of funds contributed) differences, partners generally choose to send an equal number of people to the IPO, most of whom have "little knowledge of U.S. acquisition and contracting methods."

"Technical expertise is a bonus, but sound management experience is a must."

In addition, foreign military and civilian personnel are subject to the same job rotations, promotions, and retirements that U.S. staff are, so that staffing the IPO can be a constant problem. Since the deputy program manager is generally from a partner nation, the program manager cannot rely on a civilian deputy to take care of personnel issues. It is useful to appoint a senior U.S. staff member with supervisory experience to help. In this situation, it is best to use experienced managers. "Technical expertise is a bonus, but sound management experience is a must." Thus, it is also best to "avoid U.S. people who need to learn acquisition"—there will be enough internationals needing to do so. It was even suggested that the "United States should fully staff the IPO [using host

nation support] and use Europeans as you can."

Less extreme solutions are also available, however. Certainly, the program manager "needs to be a good trainer," to understand the individual's strengths and weaknesses, and to perform "situational supervision." In addition, European personnel should be encouraged to arrive early (especially to a newly formed office), and IPO personnel can attend numerous acquisition courses, including international courses at the Defense Systems Management College. Kwatnoski stresses the need for U.S. personnel to understand international agreements, especially those relating to intellectual property rights (1995). Also, the program manager can get the whole IPO up to speed on important issues via group training and team building. Group trips to field activities can be arranged to help establish a shared knowledge base, and foreign sponsors or training communities can be invited to visit the IPO.

Dissension (e.g., argumentative team members) may be avoided to some extent by screening; however, problems can also be avoided if they "live together, so honor is not on the line over disagreements" (D'Agostino, 1996). The program manager can teach by example, demonstrating give and take versus trying to win every battle. The goal is a seamless team that puts the program ahead of parochial national interests.

"U.S. members need to avoid a bureaucratic mindset, second-guessing and micromanaging other players, including contractors."

Residual learning curves for specific expertise deficiencies can be handled via outsourcing. A fresh view can be quite helpful. "Be prepared for jealousy from people not working international programs," but "don't miss the wind of change."

Management Issues

International programs face all the challenges of domestic programs and then some. Certain aspects become particularly important in multinational groups. "The international acquisition manager is a consensus builder dealing with a plethora of naysayers far exceeding that found in domestic programs" (Kwatnoski, 1995). To instill mutual trust, the program manager must display a win-win attitude, instead of viewing the collaboration as a technical giveaway. The goal is to build a group culture that views the program as shared, with the internationals as coworkers, and to avoid a culture that is national in flavor, with liaison representatives viewed as outsiders. "European members must be equal to U.S. people." When members trade home phone numbers, someone's doing something right!

U.S. members need to avoid a bureaucratic mindset, second-guessing and micromanaging other players, including contractors. Unfortunately, "the European process is similar to U.S. processes five years ago," and "most people you deal with [in the United States] don't appreciate the international program." For instance, MIDS had problems with badges for foreign IPO members, especially for after-hours work. The program manager had to invent special "Blue Badges" to identify and allow after-hours access for international IPO members. Also, be

aware that some countries don't have a "confidential" classification, so they have a tendency not to safeguard confidential materials. Furthermore, management is the stock and trade of generalists; "specialists can't be allowed to run the program." Resist being handcuffed with overly detailed requirements.

Specific expertise can be retained or enlisted as needed. Resistance exists to using only U.S. field activities or federally funded R&D centers, but other countries (such as Australia, Canada, and the Netherlands) also have them. Of course, the size of the program is important for determining IPO size and structure, the nature and oversight of the contract(s), Congressional visibility, and how quickly things might be accomplished (e.g., the X–31 was done in record time). Your schedule risk will rarely be less than medium; however, risks can be mitigated through the use of preparation, experience, and training (PET)—a phrase used by Kwatnoski (1992, 1995). Recording lessons learned will add to the international data base so ICRADs improve in the future.

Recommendations and Conclusions

If the United States is serious about international cooperation as the technique of choice for the future, it has numerous opportunities to demonstrate its commitment. First, international aspects must be fully integrated into, and in some cases drive, requirements. Similarly, acquisition planning should include the assumption of cooperative development, production, and execution. Likewise, training (formal and on-the-job) for both communities should emphasize cooperation. Obviously, this would entail a major shift in mindset as well as procedure. But that is precisely what the world is presently experiencing with the "relative decline of American power and the increase of global interdependence"(Jones, 1997).

ICRADs need be linked to interdependent, coalition missions with the commanders in chief and joint staff fully engaged if such climactic, climatic changes (as described above) have much chance of success. Many of the necessary changes, fortunately, follow in the steps of recent trends such as defense acquisition workforce implementation act certification, joint R&D and mission planning, acquisition reform, and empowerment. But with the many and continuing "barnacles on the ship of progress," it will be a rough ride.

An alarming tendency exists in the land of the free and the home of the brave to effect change by fiat rather than through motivation and guidance—continued protestations of the pursuit of empowerment to the contrary. The powers that be might consider the old motto of the Philadelphia Savings Fund Society: "Wishing won't do it, saving will." I suggest that the top-down approach be aimed at reducing and eliminating impediments to international cooperation while encouraging and motivating requirements, operations, and acquisition personnel to engage in the cooperative process. Skills + Desire = Product. When priorities, prestige, and promotions go to those succeeding at international cooperation, you'll have to search for another problem. Why? Because without problems, they wouldn't need us!

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