

CFU-AM-11-021



ACQUISITION RESEARCH SPONSORED REPORT SERIES

**Impact of U.S. Export Control and Technology Transfer
Regime on the Joint Strike Fighter (JSF) Project—A UK
Perspective**

3 May 2011

by

**David Moore, Peter Ito, Stuart Young, Kevin Burgess, Peter
Antill**

Cranfield University

Approved for public release, distribution is unlimited.

Prepared for: Naval Postgraduate School, Monterey, California 93943



ACQUISITION RESEARCH PROGRAM
GRADUATE SCHOOL OF BUSINESS & PUBLIC POLICY
NAVAL POSTGRADUATE SCHOOL

The research presented in this report was supported by the Acquisition Chair of the Graduate School of Business & Public Policy at the Naval Postgraduate School.

To request Defense Acquisition Research or to become a research sponsor, please contact:

NPS Acquisition Research Program
Attn: James B. Greene, RADM, USN, (Ret.)
Acquisition Chair
Graduate School of Business and Public Policy
Naval Postgraduate School
555 Dyer Road, Room 332
Monterey, CA 93943-5103
Tel: (831) 656-2092
Fax: (831) 656-2253
E-mail: jbgreene@nps.edu

Copies of the Acquisition Sponsored Research Reports may be printed from our website www.acquisitionresearch.org



ACQUISITION RESEARCH PROGRAM
GRADUATE SCHOOL OF BUSINESS & PUBLIC POLICY
NAVAL POSTGRADUATE SCHOOL

Abstract

The research assessed the international impact of the U.S. export control and technology transfer regime with a focus on two specific areas: the UK experience with the U.S. requirements as they relate to the Joint Strike Fighter (JSF) and the impact of U.S. regulations on logistical support for the worldwide JSF fleet. The goal of the research was to generate insights into the nature and extent of the impact of U.S. requirements and identify alternate approaches to the current regime.

The overwhelming UK government and industry view is that even with the most generous perspective of the U.S. system, it is fundamentally flawed in its implementation. UK representatives working on the JSF indicated agreement with the goals of U.S. policy, skepticism regarding the impact of those policies on effective project management, and harsh criticism of the process by which the U.S. controls are implemented.

The data indicated that interviewees found U.S. requirements generated significant delay, increased costs, dampened initiative to increase capability or efficiency, established critical and unnecessary restrictions on information sharing, and constructed barriers to effective supply chains. There was a sentiment that the U.S. process for obtaining approvals was so difficult, the default decision was to use the safest route, even if that precluded consideration of cheaper or more efficient suppliers, potentially valuable technologies, or alternatives that might have provided more “value for money” in the JSF. UK representatives thought U.S. requirements not only inconvenience non-U.S. participants, but do not serve U.S. goals in generating an effective project to produce the best equipment. There was recognition of the need to regulate sensitive technology, but a strong view that the focus on U.S. requirements is fundamentally wrong. The representatives believed that the U.S. has generated a complex system that attempts to regulate all items, and thereby fails to provide a focus on effective security for truly sensitive items. UK



interviewees expressed frustration with the extent to which U.S. requirements come into play on non-U.S. military items, such as the Eurofighter Typhoon.

With regard to the impact of U.S. requirements on the future JSF logistical support arrangements, it appeared that it was too early in the process of deliberation on this issue for UK interviewees to have solid views. On the question of whether the U.S. requirements are a major deterrent to participation in U.S.-led projects, the responses varied depending on the size of the UK firm involved and the potential business with the U.S. However, there was great sympathy for UK firms to design around U.S. requirements and avoid becoming enmeshed in the U.S. regime. Finally, there was strong support for the efforts of the Obama Administration to fundamentally reform the U.S. system, but substantial skepticism that it will be successful.

Keywords: U.S. export control, technology transfer regime, Joint Strike Fighter (JSF), UK government and industry, Eurofighter Typhoon



CRF-AM-11-021



ACQUISITION RESEARCH SPONSORED REPORT SERIES

**Impact of U.S. Export Control and Technology Transfer
Regime on the Joint Strike Fighter (JSF) Project—A UK
Perspective**

3 May 2011

by

**David Moore, Peter Ito, Stuart Young, Kevin Burgess, Peter
Antill**

Cranfield University

Disclaimer: The views represented in this report are those of the author and do not reflect the official policy position of the Navy, the Department of Defense, or the Federal Government.



ACQUISITION RESEARCH PROGRAM
GRADUATE SCHOOL OF BUSINESS & PUBLIC POLICY
NAVAL POSTGRADUATE SCHOOL

THIS PAGE INTENTIONALLY LEFT BLANK



ACQUISITION RESEARCH PROGRAM
GRADUATE SCHOOL OF BUSINESS & PUBLIC POLICY
NAVAL POSTGRADUATE SCHOOL

Table of Contents

In Brief—The Essential UK Commentary	1
Background to the Research	3
Research Methodology	5
Experience of Interviewees on JSF and U.S. Requirements	7
Acceptance of Rationale for U.S. Export Controls	9
Critical Delays	13
Additional Costs	17
Less Than Optimal Supply Chains	17
Generation of Extra Work.....	18
Administration of ITAR	19
Excessive Complexity	22
Impact on Performance	25
General	25
Restrictions on Information Sharing	26
Restrictions on Nationals	29
Working Relationships	30
Concerns Regarding Intellectual Property Rights (IPR)	33
Excessive ITAR Control	35
ITAR as Trade Barrier	37
ITAR Process—“Sloppy Work”	39
U.S. (and UK) Attitudes	41
U.S. Attitudes: Technology.....	41
U.S. Attitudes: Political Policies.....	42



U.S. (and UK) Attitudes: Source Codes	43
U.S. Attitudes: U.S.–UK Treaty	46
U.S. Attitudes: Practical Working Relationships	48
UK Attitudes on U.S. Relationship.....	52
ITAR Free.....	55
Reform of the U.S. System.....	57
Prospects for Reform	59
Prospects for Reform: Risk	60
Logistical Support	63
ITAR as a Cost of Doing Business	67
Key Findings	73
Conclusions	77
References	79
Appendix A.....	81
Questionnaire.....	81
Appendix B.....	85
Appendix C.....	89
JSF Timeline, 1983–2010	89



In Brief—The Essential UK Commentary

“In all candour, I would encourage UK industry to design around the U.S. International Trafficking in Arms Regulations (ITAR) and produce ITAR-free items.”

–Rt. Hon. James Arbuthnot, Chairman of the UK House of Parliament
Defence Committee

“One of our suppliers had a fire at their facility. We determined that it was better to wait for them to rebuild their facility than try to get U.S. approval for an alternate supplier.”

–UK Industry Representative



THIS PAGE INTENTIONALLY LEFT BLANK



Background to the Research

The research project assessed the international impact of the U.S. export control and technology transfer regime and was conducted jointly by Cranfield University and the U.S. Naval Postgraduate School. Cranfield focussed on two specific areas: the UK experience with the U.S. requirements as they relate to the Joint Strike Fighter JSF (or F-35) and the impact of U.S. regulations on logistical support for the worldwide JSF fleet.

The goal of the research was to generate insights into the nature and extent of the impact of U.S. requirements and identify alternate approaches to the current regime. In preparing for the research, it was anticipated that topics such as technology development, working relationships, and commercial and organisational behaviour would be of particular importance. The primary research questions were as follows:

- What is the overall impact of U.S. export controls and technology transfer regulations on the proximate stakeholders: governments, defence industrial firms, and armed forces?
- What issues have arisen among the stakeholders as a result of those policies?
- What are the more promising avenues for improving the performance of U.S. export control regimes and technology transfer policies?

The focus was on ascertaining the UK perspective on the actual impact of International Traffic in Arms Regulations (ITAR) with regard to JSF, which could have utility in assessing the impact of those rules on cooperation with Allies and partners. It was a unique opportunity for those in the UK who have worked with U.S. regulations on a major U.S.-led multinational project to provide candid commentary on the impact of those rules. And as the Obama Administration announced in 2009 a major effort to reform U.S. export control policy and process, UK comments were particularly valuable at this time.



The Cranfield researchers expected that the efforts would complement other studies of U.S. export controls, such as the report by Bialos, Fisher, and Koehl (2009). However, the scope of this project permitted only a partial investigation of the entire question of U.S. policy and process. And while there has been some initial consideration among UK participants on the major issue of logistical support for the JSF, and some of the areas of concern are already apparent, it would be more worthwhile to conduct further research on this issue at a later stage when more decisions have been reached and the support requirements and arrangements have become clearer.



Research Methodology

Subjects and Relevant Demographics

Cranfield received data from nine industry representatives and seven UK government officials working on the JSF. There were 15 interviews conducted (in person or by telephone) within the framework of an extensive questionnaire (Appendix A), but the interviewees were encouraged to address any issues they thought were critical. As a result, they covered a wide range of issues, ranging from broad policy to details regarding suppliers. One individual provided purely written responses to the points in the questionnaire. There are also 15 responses from those 16 interviewees to a separate, Likert scale questionnaire (Appendix B). The one exception was that of the Rt. Hon. James Arbuthnot, the Chairman of the House of Commons Defence Committee, where it was simply inappropriate to put the request for the completion of the Likert scale questionnaire.

Ethical Considerations Around Questionnaire Administration, Confidentiality and Data Storage

Each individual who participated in the interview was asked whether his/her comments were for attribution. With one exception (Chairman Arbuthnot), all the interviewees made clear that their comments were not for attribution. The companies that participated in this research made clear they required an opportunity to review the Cranfield report to ensure that anything their employees said was not an inadvertent release of sensitive information. Cranfield made clear that their right to edit only extended to the comments of their employees. Cranfield will be holding the raw data from the interviews. Should any reader wish to access the raw data, the request will need to go to the relevant company or government body, and that entity (or individual) will decide whether to provide access to the original material.

After reviewing the literature on U.S. export controls and the JSF project, the questionnaire was developed to raise the key areas in which it could be anticipated that U.S. requirements would generate potential problems. That would include topics such as generating delay, increasing costs, or having an impact on



development of technology. There was also a conscious effort to ensure that interviewees would not feel restricted to the topics in the questionnaire and they were encouraged to provide comments on any issues they wished, including suggestions for improving the U.S. export control and technology transfer regime.



Experience of Interviewees on JSF and U.S. Requirements

The individuals interviewed were selected because they are substantially involved with the U.S. requirements and their impact on the JSF. The interviewees were asked to provide a response to the statement “U.S. export control and technology transfer requirements had a significant impact on the conduct of my work on the JSF.” The responses from the nine industry representatives were as follows:

Strongly Disagree										Strongly Agree	Do not Know
1	2	3	4	5	6	7	8	9	10		
		(1)		(1)			(3)	(2)	(2)		

Average: 7.7

For the six government employees, excluding Chairman Arbuthnot (who, as will be seen later, has had an extensive interest in JSF and U.S. regulations), the numbers were as follows:

Strongly Disagree										Strongly Agree	Do not Know
1	2	3	4	5	6	7	8	9	10		
			(1)		(1)	(1)	(1)			(2)	

Average: 7.5



THIS PAGE INTENTIONALLY LEFT BLANK



Acceptance of Rationale for U.S. Export Controls

Before addressing the details of how U.S. export control and technology transfer policy was implemented, it was worthwhile to gauge the extent of support among UK representatives for the goals of that policy. The specific statement put to the interviewees was “There was a clear rationale for the U.S. requirements.” There appeared to be a wide variety of views across the spectrum, with more support among industry representatives than government representatives. For industry, the distribution was as follows:

Strongly Disagree										Strongly Agree	Do not Know
1	2	3	4	5	6	7	8	9	10		
	(1)	(1)			(2)		(1)	(3)	(1)		

Average: 6.8

For government representatives, the distribution was as follows:

Strongly Disagree										Strongly Agree	Do not Know
1	2	3	4	5	6	7	8	9	10		
	(1)		(1)	(1)	(1)		(2)				

Average: 5.5

What became noticeable in the conduct of interviews was that the commentary indicated substantial UK support for the idea that sensitive technology needs to be protected. The fault may have been in the way the statement was phrased, as the “requirements” may have been thought to encompass the process as well as the policy, where there was little UK support for the former, but understanding for the latter.

One government representative stated there is no objection to a complex, intensive system for truly sensitive items. Another government interviewee added that a U.S. policy goal should indeed be to reduce proliferation concerns. An industry representative expressed full agreement with the rationale for U.S.



regulations, and added that the justifications have been made clear. Another industry participant concurred that there have to be regulations on technology transfer, and the requirements do make people think about what to sell to a particular country. Yet another industry interviewee commented that ITAR, strictly speaking, is not a problem.

However, even the statements of understanding for U.S. policy were augmented with varying levels of criticism of U.S. practice. One industry representative noted previously said that the system in general is understandable, but added that it is a political tool, which does not help industry, even U.S. industry. Another industry participant noted previously added that the problem is that the regulations are too broad, and as there is no discrimination among items, the U.S. regime covers low-technology items as well. The interviewee added that the company had learned to work within ITAR, but there is a need for clarity on the regulations.

One government representative began by noting that ITAR does not deserve its bad reputation, but ultimately commented that ITAR is a “well-maintained car which unfortunately is a Model T and not a Porsche.” Another government participant stated that U.S. regulations are a minor irritant, and not a major problem, and reiterated the point that even as an irritant, there is a justification for the requirements. The individual added that at least the U.S. has a formalized process, whereas in the case of European projects, the process can be more complicated and can take longer. However, even this interviewee described the U.S. system as “bizarre.”

Before turning to the specific areas in which U.S. policy and practice drew criticism, it is important to note that the interviewees, particularly from UK industry, often commented that it can be difficult to distinguish when JSF problems arose due to ITAR, and which are inherent in a process in which UK firms are dealing with U.S. firms on a complex military project. An additional complication is the fact that the UK firms do not generally deal directly with the U.S. government on ITAR-related



requests, but need to pass them through a U.S. firm, particularly Lockheed Martin, the JSF prime contractor. While UK firms meet and work with people from, for example, the JSF project office, as needed to address specific issues, specific ITAR requests need to go through a U.S. firm for which the UK firm is working. The attempt is made whenever possible to distinguish those points when they were made in interviews.



THIS PAGE INTENTIONALLY LEFT BLANK



Critical Delays

The most frequently cited criticism from UK representatives was that ITAR generates significant delays. In response to the statement that “U.S. requirements generated major delays,” the responses from UK industry representatives were as follows:

Strongly Disagree										Strongly Agree	Do not Know
1	2	3	4	5	6	7	8	9	10		
(1)	(1)	(1)		(1)	(1)	(1)			(3)		

Average: 6.0

For UK government representatives, the distribution was as follows:

Strongly Disagree										Strongly Agree	Do not Know
1	2	3	4	5	6	7	8	9	10		
	(1)	(1)		(1)		(2)	(1)				

Average: 5.3

One industry representative cited the estimate generally provided by interviewees that it takes 6–9 months for JSF requests to be processed in Washington. That has an impact on numerous aspects of the project. Another industry participant focused on the issue of suppliers and stated that the delay and loss of time is a “threat” to JSF. As it takes so long to get approval for a new source or supplier, firms decide not to do so. Regular suppliers raise prices knowing that they have a guaranteed position, since the firm being supplied is not going to try to replace them with cheaper or better suppliers. The interviewee added that the delay is hard to fathom as other governments can process such changes in two months, and the UK can do it in days.

Another industry interviewee addressed a different aspect of the issue of ITAR-generated delay. He stressed that the delay in U.S. processing has a



particular impact on urgent requests from UK industry. In some cases, the company will have a pressing requirement, but it is thrown into the process for consideration along with routine requests, and the company cannot count on an expeditious response. That can have practical impacts, such as production having to be slowed due to the need to wait for a U.S. decision on an unresolved technical issue. Another industry participant commented that the process generates doubt in company operations, as the firm can never be completely confident that it will get the answer it wants from the U.S. until it arrives. There is a general belief that the approval will come through, and the company had never received a rejection of the request, but it only arrives after a delay, during which the company was not working at maximum efficiency.

Yet another industry representative noted that difficulties arise from the fact that ITAR does not align with the work timeline. The conflict between project timescales and ITAR timescales forces decisions to be made ahead of full information being available, especially long lead items which may need to be ordered within the first six months of the project. Otherwise, firms are waiting for decisions from the U.S. All of this delays design, building, and testing. The example cited was that the company designed a piece of equipment against what it thought was the requirement. It was clear from the onset that there could be deficiencies. They ran the equipment, and there were indeed problems, but not the deficiencies that were anticipated. The firm got new specifications and had to redesign the piece of equipment—all of which is normal in the design of new equipment. However, the delays generated from ITAR resulted in an extra year of work and added tens of millions of dollars in cost.

These views are echoed by UK government interviewees. One government representative noted that ITAR makes it take much longer to acquire equipment. Another government participant stated that ITAR generates delays, which costs money. The sympathetic view provided by one government interviewee was that, as a general statement, U.S. requirements add to the amount of time required to complete work, and could generate delays if people do not plan properly. The key is



to ensure that those working on a project have included ITAR requirements in their planning. For example, ITAR requires that all items are marked properly. If that is not done, it will generate delays. However, the response from an industry participant was that these marking requirements are time-consuming and directly add to costs, which is the next set of items to be addressed in this report.



THIS PAGE INTENTIONALLY LEFT BLANK



Additional Costs

Less Than Optimal Supply Chains

The issue of delay had a direct impact on the costs of suppliers for the JSF project. Citing an example, an industry participant noted that bearings for a component of the JSF are made by one U.S. firm. They could be acquired from a European firm at a lower cost and with a more secure supply chain. However, ITAR makes it easier to stay with the existing supply chain and deters any effort to drive down costs and obtain greater security. The rough estimate provided by the interviewee is that there is an additional 30% increase in JSF unit costs due to the impact of ITAR.

Another industry representative noted that a company cannot work with another firm without first getting U.S. approval, which makes it difficult for companies to make changes and improvements, particularly due to the long delays involved. Indeed, ITAR forces firms to decide on the entire supply chain from the beginning, removing the flexibility which would allow for better decisions on suppliers. The interviewee used a hypothetical example: a firm in Poland may be cheaper and better at providing a particular item. But it is far easier for the UK firm to pick an approved supplier, even if it is not better or cheaper. The interviewee also cited a concrete JSF example. The firm sought to have supplier workshops which require amendment of the license. After 14–16 months, the company was still waiting for approval as the U.S. continued to ask for details on issues such as who would attend, what information would be shared, and why more U.S. firms were not included.

In short, as noted by another industry participant, ITAR leads to a sub-optimization in the performance of the supply chain. The difficulty in adding approved firms to the list restricts the ability of companies to search for the best suppliers, which adds to costs. It is not possible to use Chinese firms on the JSF.



But even with regard to a potential UK supplier, the issue is whether the UK firm is willing to wait 6–12 months for a decision on a new supplier.

One interviewee noted that while some new suppliers may be worthy of consideration, they are not on the Technical Assistance Agreement (TAA). That means a 9-month wait for approval from the U.S. The added complication is that the UK firm has to make the request to Washington through the U.S. firm with which it is working on the JSF. So the UK firm is hindered in numerous ways from getting the best suppliers. As a result, the firm simply falls back on using old, approved suppliers, as it is difficult to conduct competitive tendering and search for replacement suppliers under a process that takes months, rather than weeks. This led the interviewee to cite the following example. A fire at one of its suppliers made it impossible to get supplies, but the firm determined it was better to wait for the company to rebuild the facility, rather than seek clearance for a new supplier from the U.S.

The interviewee noted that the UK firm has numerous prime suppliers, each of which may have numerous sub-tiers, with each of these possibly having even more sub-tiers. Due to ITAR-driven requirements and timelines, the basic question is “who is approved,” rather than “who provides best value.” As the representative noted, if approvals could come in 6–8 weeks, this weakness in the process could be addressed. That is not possible with a period of 9–12 months for approvals. The effect for all suppliers generates inefficiencies and greater cost. Ultimately, the costs simply get passed along from the sub-tiers to the prime suppliers to the U.S. prime and the U.S. government.

Generation of Extra Work

One specific variation on this issue involved the extent to which ITAR forced UK firms to do more work than was otherwise needed, and for little apparent reason. The statement on the Likert scale questionnaire was “U.S. requirements generated



substantial additional work.” For industry representatives, the responses were as follows:

Strongly Disagree									Strongly Agree	Do not Know
1	2	3	4	5	6	7	8	9	10	
		(1)		(1)	(1)	(1)	(1)	(1)	(3)	

Average: 7.5

For government representatives, the distribution was as follows:

Strongly Disagree									Strongly Agree	Do not Know
1	2	3	4	5	6	7	8	9	10	
			(1)		(1)	(2)	(2)			

Average: 6.6

One government representative asserted that ITAR requirements had generated a substantial amount of additional work. With regard to specific examples of how that occurs, one industry participant returned to the issue of delay and suppliers, and questioned why it was necessary for the firm to go back to the U.S. for approval to work with a UK or European firm that had been vetted and approved elsewhere by the U.S. Another industry interviewee noted another manner in which ITAR-imposed delays can generate extra work, citing the example of the development of a new component in coordination with a U.S. firm. The UK firm wanted to begin some of the initial work with the U.S. firm before the amended license approval arrived. As that was not possible, the UK firm was forced to undertake the work under a more compacted and less efficient timetable.

Administration of ITAR

Delay was only one ITAR-related cost that was cited by UK representatives. Another involved administrative costs in connection with ITAR compliance. One industry participant noted that the company had to pull a lot of personnel together to form teams to address ITAR requirements, all of which generated administrative



costs. Another industry interviewee commented that 600 people in that company have been trained on ITAR details to ensure no mistakes occur. And the company had instituted a new computer training program. The interviewee added that many sections of the company were not familiar with ITAR, so there was an extensive amount of training which needed to be conducted, emphasizing the point that while this is not a problem for a large firm, small firms cannot afford this cost.

Another industry representative stated that everyone in the company working on JSF gets ITAR training every year. Indeed, knowledge of ITAR is essential for those people working on the JSF. The interviewee added that the rotation of U.S. personnel working on the JSF means that the UK often briefs U.S. officials on the requirements. All of this has proceeded well as the company is determined to avoid any ITAR breach, but it entails time and effort to generate a change in the firm's working culture.

One industry participant echoed the view that the company's employees working on JSF may know more about the ITAR than U.S. firms. The firm created a compliance team to work solely on the JSF, which was something the company has never done before. Personnel from the legal department, administration, and other departments were brought into the group. The rest of the firm also became more aware of the significance of compliance with U.S. requirements, and also provided indirect support.

Citing an example that went beyond JSF to the issue of the impact of U.S. policy, another industry interviewee made the point that the company now has an export control team, but did not establish it until 2002. Until then, business was under straightforward government-to-government arrangements or old projects with established relationships. For old projects, the existing licenses were assumed. However, one item had been licensed to the firm in the 1950's from a U.S. firm. Over the coming decades, the UK firm developed the item independently and added considerable IPR, to the point that it was essentially a distinct product. The company had paid for the use of the IPR and had not even spoken to the U.S. firm



about the item for a long time. However, when U.S. sanctions against a particular country came into effect, the UK firm could not sell that item to that country due to the presence of a handful of parts to the original design. The fact that there was no time limit on the ITAR control (any advanced technological information having ceased to be secret or innovative many years before) and the fact that no de minimus rule applied, was very frustrating and a good example of ITAR having impact far beyond what is reasonable. That convinced the UK firm of the need for a unit focused on U.S. export control requirements.

The interviewee went on to note that the firm then began participating in JSF, which generated complications of the type which affect UK industry in general. JSF is not a Foreign Military Sales (FMS) programme in which the U.S. government handles everything, and there was little flexibility or uncertainty regarding requirements for subsidiary firms on matters such as ITAR. Moreover, the top 10 UK firms really did not work that directly and extensively with the U.S. and had limited knowledge of ITAR. And one industry representative noted that the UK firms also have the additional concern (and expense) of educating smaller suppliers which do not have extensive experience with ITAR requirements.

One government participant stated that those in the UK working on the JSF certainly must have an awareness of ITAR requirements and obtain the required expertise. For specialists working on the JSF, an extensive amount of knowledge is required. For the rest, only a general amount of information is needed. Indeed, as the U.S. rotates people through the JSF project, the interviewee agreed that it is sometimes the case that experienced UK officials explain ITAR requirements to U.S. counterparts. It should be noted that another government representative, while conceding the point that industry does incur a cost due to additional staff dedicated to meeting ITAR requirements, commented that some of these costs are inherent in a complicated project like JSF, and it is difficult to separate out those costs which were directly attributable to ITAR.



It is worthwhile noting that these administrative steps are driven by the extent to which the company's senior leadership is focused on ITAR requirements. One industry representative stated that compliance with U.S. regulations is the third most important factor for the firm regarding JSF participation (after production rate and affordability of the aircraft). That is indicated in the extensive training process undertaken in the firm for employees working on JSF. Another industry interviewee made clear that ITAR requirements have an impact on decision-making in the company, with senior management fully supporting the need for ITAR compliance.

However, in another firm, an industry participant noted that it was difficult to get senior management engaged on ITAR, as defence projects constituted only 20% of the company's business, and the U.S. is only 40% of that amount. As a result, getting leadership engaged on 8% of the firm's income was difficult. Another industry representative commented that the leadership only seemed to care about ITAR when things go wrong. However, to put that in perspective, added the interviewee, some 3–4 years ago, ITAR was not common knowledge within the firm. Now it is considered essential.

Excessive Complexity

One reason noted by UK representatives for the substantial costs involved in administering ITAR is that it is not an easy or straightforward process. One industry participant noted that ITAR is complex, adding that while the key concepts are easy to understand, the devil is in the details and interpretation of the provisions. What exactly constitutes "access"? What exactly is "disclosure"? The issues are black and white in some instances, but only if the individual or firm is familiar with the substance of ITAR. There are numerous levels of understanding about ITAR, and some companies have virtually no awareness of the requirements. Indeed, stated the interviewee, there is a limited pool of real specialists in the UK working on U.S. export controls. Supporting that point, one government representative said that they have a handful of people who have ITAR expertise, and it is an open question whether UK industry has the same level of knowledge.



One industry interviewee stated there are illogical decisions from the U.S. and no consistency on what is military or non-military. Elements of aircraft design and items such as stealth elements are clearly military. But technical performance data for engines, like length of service, is not really a military issue. Moreover, ITAR coverage provisions on “derived from” or “pertaining to” make it very wide-ranging and not clear to industry.

In addition, an industry representative stated that it is not clear what authorizations are for, as they are often vague. Yet another industry participant stated that the ITAR definitions themselves are not precise. Does a reference to forging constitute “technical data”? The system does not provide guidance or an answer. And another industry interviewee added that ITAR in some ways is not difficult, but the key requirement is to have clarity on the regulations, which is currently not the case. One industry representative noted that there have to be regulations on technology transfer, but there has to be flexibility in the system, as well as clarity and consistency of application. Those are not apparent in ITAR.



THIS PAGE INTENTIONALLY LEFT BLANK



Impact on Performance

General

One other topic of substantial general interest among UK participants is the extent to which the ITAR may affect the ultimate performance of the JSF. As one industry representative stated, the rules make it difficult to push the technological envelope. As a result, the decision is to do it in a “safe’ way. In addition, ITAR restricts the exchange of data to see if better technical solutions or improvements in capability or performance are possible. And if the goal is to push for the potential use of new technology, that requires a quicker turn-around on decisions from the U.S. than is being achieved under the current process. As one government interviewee noted, while it is not possible to cite an instance where technology has been banned from being brought to the JSF due to ITAR, it could well have had an impact by driving deliberations toward less technologically sophisticated systems.

One industry representative cited the case in which the UK firm believed that a company from another European country was capable of filling a particular role on JSF. Unfortunately, it took a significant amount of time and effort to get U.S. approval to bring in that company. While the result was successful in this particular instance, the interviewee noted that it would not be surprising if other firms decided not to pursue an option that could generate more performance, capability, or skills simply due to a desire to avoid the complications thrown in the way by ITAR.

Another industry participant addressed the performance issue, and the impact of ITAR, from a different perspective. The individual stated that if the question is put in terms of whether the item actually does what is required on the specification, then the answer is “yes.” But the specification itself cannot be challenged, particularly as ITAR requirements make it difficult to get the information to re-evaluate those specifications. Especially as performance data is export controlled, the only way it can be obtained to re-assess the requirement is by relying on data from others. As



the interviewee noted, using the traditional formula of obtaining 80% versus 20% of performance, ITAR hinders getting the remaining 20% of performance. Another industry representative said that ITAR may not have killed any potential development of JSF technology, but it has affected the ability and willingness of industry to pursue possible avenues of technology development.

It should be noted that there can be differences of opinion over the question of whether a decision not to pursue technological or performance enhancements is a direct result of ITAR. One industry interviewee reiterated the point that there was no example of a decision to not use a technology on JSF due to ITAR. One government participant noted that there certainly were decisions that can be cited in which some options that might have improved JSF capability were not pursued. However, it is not clear that those decisions were actually the result of ITAR considerations. Some may not have been pursued due to competition among the companies, and not ITAR. Another industry representative cited an example in which the UK firm proposed technology, but Lockheed said it could not acquire approval from Washington. The UK firm traded for less valuable work, which meant the company got a bad result. But from the perspective of JSF capabilities, the interviewee thought it could not be characterized as a clearly bad result for the project.

Restrictions on Information Sharing

The preceding discussion raised the issue of the extent to which UK representatives believe ITAR has a significant negative impact on JSF and other projects by restricting the sharing of information. A statement on the Likert scale questionnaire was “U.S. requirements inhibited opportunities to obtain necessary technical data.” The industry responses were as follows:



Strongly Disagree										Strongly Agree	Do not Know
1	2	3	4	5	6	7	8	9	10		
			(1)			(1)	(2)	(3)	(2)		

Average: 8.2

For government representatives, the responses were

Strongly Disagree										Strongly Agree	Do not Know
1	2	3	4	5	6	7	8	9	10		
		(3)					(2)				(1)

Average: 5.0

One industry representative noted, citing an example, that the interviewee’s team was tasked with designing a key JSF component. However, it is not possible to design a component in isolation, and it is necessary to obtain large amounts of relevant data. ITAR made it impossible to obtain this data, such as on operating margins and operating temperatures, so it was not possible to design the component in the most efficient way possible. And the individual made clear that this was not a restriction of information due to intellectual property rights (IPR), but restrictions imposed by ITAR.

The interviewee provided a second example in which the UK firm was not authorized to know about any additions or modifications undertaken by a U.S. firm to a particular JSF component. The UK firm then had to produce items in which that component was used. Ultimately, the UK firm had to design around the U.S.-modified part, without knowing all the details. This generated difficulties with regard to testing the complete unit, as well as how the entire system would operate, particularly with regard to certain performance scenarios. As a result, the solution was to send the whole system from the UK to the U.S. for testing, and then return it to the UK. The interviewee’s comment was that getting to 100% of the specified



requirement was possible, but it took more time and effort, with additional design work necessary due to the barriers imposed by ITAR.

As another industry participant noted, while a creative work-around can sometimes be found to obtain the required data, in other instances, the UK company's response was simply to give up trying, particularly when the U.S. requirements are exceptionally impenetrable. To cite one experience, there were provisos which were inserted which were marked "U.S. eyes only," even though the UK firm was working on the item.

Such restrictions on information sharing clearly add to cost, delay, and performance. A different aspect was noted by one industry representative, who commented that when the UK firm works through a U.S. firm and has a novel proposal which necessitates some sharing of information, the U.S. firm is responsible for getting that approval from Washington. The immediate response on the U.S. side often is to simply reject the UK initiative, rather than undertake that onerous process. Should the UK firm wish to pursue the initiative, it has to dedicate time and effort to get the data and make the case. All of this generates delays and costs as well as a major disincentive to generate creative ideas.

One industry interviewee stated that while there were contractual provisions which addressed sharing of information, there were instances in which there were misinterpretations and errors which blocked exchanges of information. However, there also were numerous instances where exchanges were completely blocked due to U.S. requirements. The interviewee noted previously that even when the data sharing could take place, ITAR requirements forced the separation of data into releasable and non-releasable data, which took extra effort and generated delays. And at a more practical level, noted the interviewee, it led to meetings that were rendered "almost pointless" by the removal of restricted data. Another industry representative echoed the point about restrictions on non-U.S. firms obtaining some information generating an expensive process of separating out data for UK firms.



Restrictions on Nationals

An additional aspect of the U.S. restrictions cited by UK representatives involves the focus on nationalities, which generates complications for the UK firm and serves as an inhibition for getting the best possible expertise from the broadest array of sources. One industry participant noted that ITAR is the only export control regime that is based on nationality and not destination of items. The interviewee's firm has 53 nationalities working for it, and the company is banned by UK law from asking about the nationality of applicants for positions. However, as part of its ITAR requirements, it has to list all nationalities, and an employee could be denied access to information due to the employee's nationality. In fact, noted the individual, reconciling UK law and ITAR requirements has still not fully been resolved. On a more practical level, aside from legal issues, for larger firms with lots of personnel, ITAR restrictions hinder the ability of the firm to get the best people to work on a project like JSF. Another industry interviewee added that ITAR is also in direct violation of EU legislation on nationality, generating yet another problem for UK firms.

Another industry representative stressed that U.S. firms have no idea of the restrictions in the TAA about screening of foreign nationals, emphasizing the point that UK law forbids asking about place of birth. This also affects the cost of the project, as another industry participant noted that the firm has to put employees from some countries on another project because of the assumption by the firm that there will not be an ITAR approval for these individuals to work on the JSF. One industry interviewee concurred that the requirements make it difficult for dual-nationals working for the company, noting that as firms are supposed to control employee behavior, dual-nationality is not a relevant issue, and ITAR regulations merely add unnecessary complications.

That individual noted other ways in which ITAR makes it difficult for UK industry to benefit from expertise from other nationalities. Specifically on JSF, it is difficult to consult with firms from countries not participating in the project. The



interviewee said that the UK firm had considered discussions with a Swedish firm, but that could not be pursued due to ITAR restrictions. More generally, U.S. requirements inhibit exchanges of ideas with universities and other academic institutions. U.S. approval is needed to share information with individuals from certain countries like China and India. The U.S. is reluctant to give those approvals, so it is hard for industry to get those potentially valuable views from academia. Some UK universities view it as unworkable to exclude students of certain nationalities, and other universities view it as an affront to be asked to do so.

Another industry representative noted that the strict interpretation of the ITAR rules means that if a UK firm used an American citizen as an agent or representative in the U.S., that individual could not convey back to the UK firm the substance of any discussions. If the UK firm had a U.S. branch or subsidiary, the agent could pass that information to the U.S. branch. But that branch could not then pass that information back to the UK firm, all of which generates questions about whether the system is intended to help or hinder the necessary exchanges of information.

Working Relationships

There are also intangible negative impacts from ITAR. To attempt to address one of those areas, a statement on the Likert scale questionnaire was “U.S. regulations complicated work with other industrial participants.” The responses from industrial representatives were as follows:

Strongly Disagree										Strongly Agree	Do not Know
1	2	3	4	5	6	7	8	9	10		
					(1)	(1)	(1)	(1)	(4)		(1)

Average: 8.7



For government representatives, the numbers were as follows:

Strongly Disagree										Strongly Agree	Do not Know
1	2	3	4	5	6	7	8	9	10		
				(1)	(1)	(1)	(1)	(2)			

Average: 7.3

As one industry representative noted, ITAR adds an “additional bucket of sand” to working relationships. It has a clear impact on communication with other companies involved in the JSF, particularly because of the limitations on information exchange noted previously. ITAR requirements add complexity to what would be a normal interaction, which is particularly the case with high technology items. While this is difficult to quantify, added the individual, it has a significant impact on working relationships.

As one government participant noted, the manner in which the U.S. handles sensitive items makes it exceedingly difficult for the UK, citing the example of one meeting at which a ridiculously small number of seats were made available for UK representatives. One industry interviewee noted that at some JSF meetings, non-U.S. citizens were told to leave at certain points. In one instance, that meant that the firm had one U.S. national remaining in the room while the rest of the UK team was asked to leave.

There are numerous other results that have an impact on working relationships within and between firms. One industry representative commented that ITAR can generate different types of bad working relationships, with work on JSF leading that particular firm to become compartmentalized with a separate organization within the company focused on JSF. Another result is a dilution of accountability which arises from the requirement that U.S. firms put the requests from UK firms to Washington. As one industry participant commented, once the approval comes from the U.S. government, the U.S. prime contractor does not care, as it has become a problem for the non-U.S. sub-contractor.



Indeed, in one case, the complex relationship between U.S. government, U.S. firm, and UK firm had deteriorated to the point that one industry interviewee stated that the relationship with the U.S. firm was “unprofessional.” Once again, the question arises of the extent to which such bad relationships are a specific result of ITAR, the inherent difficulty of complex projects like JSF, or bad commercial relationships, which is the next topic raised by UK representatives.



Concerns Regarding Intellectual Property Rights (IPR)

The issue of intellectual property rights (IPR) and ITAR has two different aspects. The first involves the UK perception that U.S. firms use ITAR to protect U.S. IPR. One industry participant commented that while work with other companies in other nations is always complicated, some U.S. firms use ITAR to protect their IPR. One government interviewee concurred that the U.S. uses ITAR to protect the IPR of U.S. firms. Another government representative noted that there are still numerous IPR issues involving JSF that need to be addressed. However, the interviewee shared the view that ITAR has been used by U.S. firms as a security device to prevent IPR from being passed on to competitors.

The second issue involving IPR and ITAR involves the interest of UK firms in protecting their IPR, and the impact of ITAR on their IPR. One industry interviewee noted that some of the work it has been doing in the UK is being moved to the U.S., and the concern of the UK firm is to ensure that there are no improvements done in the U.S. The goal is to have the IPR on those products maintained in the UK. Should any work be done in the U.S., it will become “contaminated” by ITAR (discussed more extensively later) and would have a long-term impact on the ability of the UK firm to use its original IPR. As noted by one government representative, while firms want to work on a major project like JSF, they are concerned about protecting their IPR. These concerns have led to difficulties with regard to integrating technology onto the JSF, as European partners have been reluctant to share information on METEOR or ASRAAM with the U.S.

One industry participant noted that a key factor is the difference in practice of U.S. and UK firms in military cooperative projects. A firm wants control over sharing of information, as information is the life blood of the business and must be protected. U.S. firms have minimal interest in IPR on military projects in which it participates, as that is funded by the U.S. government; and while companies own any IPR paid for



by the U.S. government, the U.S. has an unlimited license to exploit and use. Non-U.S. companies contribute intellectual property that has been funded privately or by other governments. Although there are processes to identify and protect this IPR, they are not accorded the respect that is expected or required. Certainly, non-U.S. firms need to protect their IPR in such projects. Moreover, UK firms have a concern about the U.S. government then sharing UK information with U.S. firms, added the individual, as the U.S. seems to assume it can do so when and if it wishes. As a result, some UK firms will not want to participate in U.S. projects, and some smaller UK firms may decide they do not want to work with a larger UK firm in a U.S. project due to concerns about whether the U.S. will protect its technical information.



Excessive ITAR Control

The preceding discussion touched on one of the key frustrations voiced by UK representatives: the unreasonably excessive reach of U.S. export control and technology transfer regulations. The fact that ITAR controls come into play on the JSF is no surprise. However when ITAR comes into play on projects such as the Eurofighter Typhoon, it generates intense UK frustration. One government participant commented that the “viral effect” of ITAR is a big problem, noting that there are some 2,000 ITAR controlled items in the Typhoon. One industry representative said the company asks why it has to put up with complex and onerous U.S. requirements, due to the relatively small number of U.S. components in the Typhoon. There are headaches generated by U.S. requirements with what appears to be little justification, which include the difficulties involved when attempting to sell items like Typhoon to third parties, with a U.S. rejection killing a sale or transfer.

The interviewee cited a particularly egregious example of ITAR-generated difficulties. A test aircraft was flown in Austria with one ITAR component. Retransfer approval was needed from the U.S., which said “yes,” but included the proviso that the U.S. manufacturer of the component had to watch the test flight. That involved the cost of an individual viewing one piece of equipment for months. The representative stated bluntly that this is ITAR “insanity.”

As one government representative noted, ITAR can be a “pain,” generating complexity in cases as diverse as a Canadian communications satellite and Halifax-class frigates. The reach of ITAR generates particular problems as it is also a major tool to enforce U.S. political policies. One industry participant noted the example that while there is no EU embargo on Venezuela, the U.S. has restrictions. Airbus was going to sell the C295 to Venezuela, but as some items were subject to ITAR, and there was political pressure from the U.S. to not undertake the sale, the sale did not go through. As another industry interviewee stated, ITAR provides



extraterritorial control to the ultimate degree. One government representative commented that the biggest problems with ITAR involve national sovereignty and extraterritoriality. The UK wants to be a good ally, but ITAR makes it difficult, which affects the UK in numerous ways, as the UK is determined to follow ITAR rules.

However, it is the issue of the impact of ITAR on IPR that generates greater frustration. One industry interviewee stated that ITAR is like “one drop of cyanide in a bucket of water. Once you’ve put the smallest drop in, everything becomes contaminated.” It makes it hard for the UK company because it may want to find other uses for its products. To cite one example, the individual noted that a civilian product that goes to the U.S. and has something added that is ITAR-related (like special paint) becomes an ITAR-controlled item. A firm wants to avoid having to produce two lines of items, so the company would not go to the U.S. and risk ITAR “contamination” for the whole product line. These are illogical decisions, and have no consistency on what is military and non-military. If a product is developed and applied on a civil project, there would be no problems whatsoever. But as soon as it is put on a military project, it becomes ITAR controlled.

Specifically on the JSF, one government representative stated that there will be “contamination” when UK software is mixed with U.S. software, which will generate a problem for future UK sales to other countries. With regard to UK industry, the contamination factor deters firms from bringing technology to projects like JSF. In addition, noted the individual, it generates friction in the UK–U.S. relationship. The UK feels that UK technology is being “stolen” by the U.S. under ITAR. Two examples are LED screen technology and night-vision goggles. If there is co-development and technology sharing with the U.S., the U.S. then slaps on ITAR restrictions, and the UK cannot freely use the technology. However, added the interviewee, it is not clear if this is a result of a deliberate U.S. policy or the lack of joined-up government in the U.S. regarding ITAR.



ITAR as Trade Barrier

Such comments indicate the perception among many UK representatives that the U.S. is using ITAR as a trade barrier. One industry participant stated that U.S. firms use ITAR to protect their business interests on key areas such as work-share. One government interviewee added that ITAR can be used as a hindrance to non-U.S. firms. Another government representative stated that the result of the complications inherent in the U.S. process is that large U.S. firms take a default position of not working with non-U.S. firms.

One industry interviewee cited an example in which the U.S. company it is working with on JSF used the ITAR as an excuse to defend a particular decision. The example involved software developed for use in the JSF. The UK firm was informed by the U.S. company that it was excluded from this work on the basis of security concerns, but never received a clear response from the U.S. government or the U.S. company. It was offered work on other systems, which it accepted, but the perception in the UK firm was that the U.S. company appeared to have used ITAR to cover a business decision, and the UK firm could not challenge the outcome.

The interviewee added that the cynical view might have been that the U.S. company had simply wanted to have the UK firm on board to show that it had international participation in JSF. Once the complexity of the working relationship became clear, the U.S. company may have decided that it was too difficult, and it would simply be better to work with U.S. companies. To cite yet another example, the UK firm had noted its capabilities in yet another area of potential work with the U.S. company. The U.S. company eventually responded that the U.S. government would not give access to the UK firm to work in those areas. However, it again was not clear about the rationale behind that U.S. government decision, merely stating that for “reasons of affordability,” it would be handled as a responsibility of the U.S. company. The interviewee stated that, as there was no transparency in the process, it is not clear if that outcome was genuinely due to a decision by Washington, or if



the U.S. company was looking for an excuse to capture work in a strategic area and to change an informal agreement that the UK firm would have that line of work.

However, another industry representative provided the contrasting view that “if the prize is big enough and where this becomes a barrier to entry, I would expect UK industry would (1) push for a U.S. government ruling as opposed to accepting U.S. industry interpretation, or (2) look for UK government support in presenting a challenge.”

One industry interviewee stated that ITAR provisions are written for the benefit of U.S. firms and cited a specific JSF example of stealth-coating having been applied to a particular part, and that action was then used as a rationale to take work from the UK firm and give it to a U.S. company. Such actions indicate that ITAR is indeed used as protection and a trade barrier. Another industry participant expressed a fair amount of certainty that, in some cases, the ITAR was used as an excuse by U.S. firms for not sharing information, as well as not cooperating. And another industry interviewee addressed another aspect of UK frustration, stating that non-U.S. firms feel they are far down in the order of priorities for the U.S. government. Non-U.S. firms have to wait a long time for decisions when bidding against U.S. firms. Even when working through U.S. companies that UK firms have acquired, there are still long delays on matters such as proposed suppliers. All of this leads to the sense that ITAR and U.S. policies are intended as trade barriers.

It is notable that Chairman Arbuthnot expressed his view that he does not share the general perception that the U.S. government has a policy of trying to use ITAR as a trade barrier. Instead, he commented, it is more a case of individuals within different parts of the U.S. government acting in an unhelpful way. Moreover, said the Chairman, it is a haphazard process, in which U.S. officials seem to feel that it is not in the interest of U.S. industry to expedite the handling of ITAR requests.



ITAR Process—“Sloppy Work”

Chairman Arbuthnot’s comments crystallize the views of UK representatives that, whatever defense can be provided on the goals of U.S. policy, the implementation process is unacceptable. Arbuthnot frankly stated that the ITAR regulations are not only unnecessarily bureaucratic, but are used as an excuse for “sloppy work” and added that the process hits “a number of buffers at a lower level of the bureaucracy in Washington.”

One example cited by a government participant involved the UK acquisition of data regarding Chinook helicopters. The UK obtained approvals from Boeing, the U.S. Army, and the Secretary of Defense. However, “some major, some place, said ‘no,’ and ‘no’ was what stuck.” Speaking candidly, the interviewee commented that such incidents make the UK think that the U.S. “cannot be that incompetent,” so it must be an intentional U.S. policy.

Another government interviewee stated that there are outrageous stories of U.S. decisions related to the JSF. For example, Canada needed a JSF for an exhibition. As the plane wound up taking a different route due to a bridge being closed, Washington required a new license. One government participant cited a non-JSF example where the UK received approval from Washington, but a proviso was included that the data (telemetry) could not be given to the U.S. Army. In another non-JSF example, the project involved an ITAR item, and approval was granted to use a French firm as an integrator. However, as it was a French national firm, the U.S. government wrote to the French government to get assurances on what that firm would do with respect to that item. As stated by the interviewee, “the response from the French government was essentially, ‘What are you talking about?’”

A part of that problem, noted one government representative, is that as new people arrive at positions in Washington, they change the policy. As one industry



interviewee noted, one difficulty is a lack of consistency among U.S. government officials deciding ITAR issues. However, a major contributing factor involves U.S. attitudes on a wide range of issues that are apparent to UK representatives and that generate difficulties.



U.S. (and UK) Attitudes

U.S. Attitudes: Technology

One complicating factor that has an impact on UK perceptions of JSF and U.S. policies involves the UK perception that the U.S. places little value on UK technology. Chairman Arbuthnot stated that the UK has a claim on a good industrial share of the JSF, which it deserves based on merit. However, he continued, there is a sense that UK technology is not regarded seriously by the U.S., and as a result, there is a “humiliation” factor in the background.

One industry representative noted that the company had arranged a session with representatives of the U.S. government to show that the UK could bring quality technology to the JSF project. However, the U.S. showed no interest. One government interviewee commented that the UK has brought good technology to the JSF project. At the start of the project, UK firms had technology and know-how which were appreciated by others involved in the project. However, that attitude changed within a few years.

Another industry participant emphasized that U.S. export control and technology transfer rules were fine when the U.S. had a big lead in technology over everyone else. However, the gap has narrowed, while the old U.S. mind-set still prevails. Frankly speaking, noted the interviewee, U.S. firms now might not be on the list for consideration, while firms from France, South Korea, and other countries will be on the list.

One government representative stressed that the UK has areas of good technology, as do other European countries. The U.S. should see it in its own interest to have a capable European defense industry as a partner, as well as to generate competition. Indeed, over the long term, it may be useful to the U.S. in addressing future competitors, like China, which are throwing significant amounts of money at the defense area. Speaking frankly, the interviewee said that U.S.



technology is not as outstanding as the U.S. believes, and its gap over other states is not as great as it believes.

Continuing the frank commentary, the interviewee said the U.S. does not seem to recognize that it is on shaky ground, and the UK does not want to find itself in a situation where it is dragged down if the U.S. does not act to reverse its relative decline. Indeed, added the individual, that is arguably the European view as well, and the UK and Europe view ITAR as symptomatic of the lack of a realistic U.S. perspective.

U.S. Attitudes: Political Policies

An additional complication arises from the impact of a variety of U.S. policy decisions. One industry representative stated that U.S. “arrogance” makes it act like a “bully,” without regard for requirements or export policies of other countries. And the mercurial nature of U.S. policy changes makes it difficult to be assured of consistency in supply and support arrangements. In cases in which long-term planning is required, there is a need for stability and security, and countries apparently have little faith the U.S. will provide such stability. As an indication of how countries respond to the threat of those U.S. policy shifts, the interviewee noted that Switzerland purchased HAWK along with supplies and spares to last 25 years, in order to be assured of supplies.

Another JSF aspect of these U.S. attitudes that arose involved the highly publicized efforts by the U.S. to have Israel acquire the JSF. Aside from any UK policy considerations, one government representative noted that the U.S. had not even discussed a possible sale of the JSF to Israel with the UK at that point, even though there are UK components in the JSF, and the UK also has its own restrictions on transfer which are similar to ITAR. Certainly, noted the interviewee, any final decision regarding sale of the JSF to Israel will be taken at the political level in the UK. However, it was clear that the key point is that the U.S. had not indicated a recognition that it needed to get UK agreement, or concurrence from any other



JSF participating nation, before proceeding with such a major step as providing the JSF to Israel.

U.S. (and UK) Attitudes: Source Codes

A discussion of U.S. attitudes with regard to the UK is the natural transition to one of the key JSF questions regarding U.S. export control and technology transfer policy: In light of the 2009 statement from the JSF project office that source codes will not be released, will the UK be denied access to JSF source codes? Chairman Arbuthnot was quite explicit on the issue. He noted that he had worked on this issue extensively for some time, and had emphasized that it is important for the UK to have the source codes. In 1996, as Minister for Defence Procurement, he had the general view that UK participation in what would eventually be the JSF was beneficial to the UK. However, he also believed the UK should pull out of the project if it could not have guaranteed access to critical items such as source codes. That remains the key issue, stressed Arbuthnot, which is critical to the UK ability to upgrade the JSF as the UK wishes, without requiring U.S. approval. And if the UK does not have that ability, it would be at the mercy of the U.S.

Without resolution of this issue, continued the Chairman, the UK could not proceed with plans to use the French Meteor missile on the JSF. This would effectively mean the end of the European missile industry. The French firm MBDA, which is providing Meteor, will do the integration of the weapons system to the JSF and is central to the source code issue. If MBDA is not able to have the access to source codes to handle weapons integration properly, this would be a major concern for the UK.

Arbuthnot stated that the Defence Committee is focused on the JSF source code issue and U.S. policy. He emphasized that source code access relates to UK operational independence. And without exaggerating the point, continued Arbuthnot, there is a certain UK “paranoia” regarding U.S. actions on the JSF. Some of this is based on past experience, such as when the UK was not told about



changes the U.S. made to the size of the bomb bays for the JSF. With regard to the 2009 JSF project office announcement on source codes, Arbuthnot noted that this is not a major concern for the UK at this time, as there frankly are many more important issues that take priority and require the Committee's attention. However, stressed Arbuthnot, this matter could become important as the actual procurement decision on the JSF comes closer.

Aside from the Chairman's comments, the views expressed by government and industry representatives about the UK eventually getting access to source codes ranged from cautiously optimistic to deeply skeptical. One industry representative noted that the UK firm is still getting the code that it needs at this time, and there have been no problems for that firm. While there had been difficulties getting source codes from the U.S., they eventually were provided. The individual added that while it may not be all the firm wants, it is what the firm needs. Along those lines, a government participant stated that the UK has had its expectations met so far and has gotten what it needs on JSF up to this point. The UK has said it will ensure it has operational sovereignty, which means (echoing Chairman Arbuthnot) that the UK can do what it needs to do on the JSF, where and when it needs to do it. If it is the case that upgrades are better done in the U.S., it is possible that this would not be a problem for the UK. But on operations, there is no reason for the UK to anticipate problems with the U.S.

One industry representative stated that UK source code access is essential with regard to systems and integration, which is a major business area. The interviewee did not know if the UK government has all the access to the source codes that it wants. But while the general sense is that the UK government can get access to the source codes from the U.S., the key issues are the cost involved with the process, the speed with which modifications can be done, and the conditions under which it can be done.

In general, noted the interviewee, the UK government has greater insight and access on source codes than UK industry. In the case of Typhoon, the access of



the UK government allowed the UK to do integration quickly and on its own. However, on the JSF, even if the UK had the relevant source codes, it is still not clear if the UK could effectively handle integration. For example, the requirement could be a UK facility for JSF set up in the U.S. This would be expensive and complicated. And there would be no role for UK industry personnel, just UK government personnel. What is the UK government ready to accept or pay to have the required integration and upgrade capability? Does it matter if UK firms are in a position to handle any of the work?

Another industry interviewee stated that the firm has worked on JSF under an arrangement that assumes it will not get source code access. This certainly generates difficulties resulting in the UK firm having to find complicated “work-arounds” or simply having U.S. firms do the work. Another industry participant stated that source code access has been a constant problem. The UK firm was never allowed near anything associated with the software, which has not helped the UK firm in understanding how the systems work. The interviewee’s view is that this will remain an obstacle in the future, with UK firms not having a full picture of what systems are doing at the time failures occur.

One government representative stated that the UK has always appreciated the need to have clarity on the source code access issue. Then-Minister of State for Defence Lord Drayson had made clear that if there was no policy agreement with the U.S. on this issue, he was prepared to pull the UK out of the JSF project. Another government interviewee agreed that the source code access issue will be important, with the problem on JSF, as indicated by Chairman Arbutnot, concerning ancillary equipment like Meteor. MBDA will need the U.S. software in order to integrate the missile. However, the interviewee anticipates that the U.S. will say “no” and will ask for the Meteor software so that the U.S. can do the integration.

The interviewee emphasized that operational sovereignty is critical for the UK, and at this point, the UK government generally believes it has appropriate assurances from the U.S. However, it is too early to be confident that UK



operational sovereignty will not be affected by ITAR, as the problem could arise in the long term. Indeed, the interviewee expressed a personal concern about whether the UK will ultimately get the source code access that it needs. During the deliberations on the 2010 UK Strategic Defence and Security Review (SDSR), the issue of UK operational sovereignty was an item in the deliberations on JSF. On balance, the UK decided it should continue its participation in the project. But there is a view that the UK government needs an exit strategy in case its assumptions on operational sovereignty are proven wrong. That depends on the actions of the U.S. government, and Congress in particular, which is complicated by the demands of U.S. industry.

The UK, continued the interviewee, does not want to find that it cannot use JSF in any number of scenarios because of U.S. decisions. Other countries could also take steps that could deny the UK usage of the JSF, but it is critical that the UK knows it has the software from the U.S. And the interviewee frankly is not convinced the UK will get all the software it needs. Senior UK officials seem to believe there will not be a problem for the UK obtaining the source codes, which is one reason there has not been an extensive, public UK–U.S. exchange about source codes after the 2009 announcement by the JSF project office. However, the interviewee is not convinced that optimism is warranted. In fact, while some of the agreements on source code access are in writing, this is still not sufficient to assuage the individual’s concerns. Unless the U.S. indicates that it genuinely realizes the need to change its policies and the way it acts, there is reason to have doubts about UK source code access, stated the interviewee.

U.S. Attitudes: U.S.–UK Treaty

One factor that has had an impact on UK skepticism about U.S. policies and actions involves the UK–U.S. Defence Trade Cooperation Treaty, which was ratified in 2010. Unfortunately, the impact seems to be minimal to negative. As stated by Chairman Arbutnot, it is certainly good that the treaty has finally been approved. However, he added, ratification might have come too late to send a good message



on UK–U.S. defence trade and to improve the atmosphere on bilateral defence cooperation. That had been the original intention behind the treaty, which was to provide another route that businesses could use to enhance cooperation. However, the treaty does not resolve ITAR issues, so it could be useful only to the extent that there are good processes generated under the treaty.

A government representative stated that the U.S. ultimately did not deliver what the UK expected. There is a very limited ITAR waiver, and the UK feels “insulted” by the outcome of the treaty. There are lots of exemptions to treaty coverage, including the JSF, with numerous JSF items exempt from treaty application. Another government interviewee stated that the treaty does not address most of the issues regarding the JSF. Indeed, the final text of the agreement is weaker than originally intended, and has no relevance to the JSF. Another government participant added that the treaty also needs implementing legislation, and it is hard to see that this will happen soon. Indeed, the treaty could create a complex system with a parallel approval process. Penalties for violations can be huge. The end result could be worse than the status quo, with a hybrid of ITAR and treaty provisions. How would the UK control and track such a hybrid system? While some UK firms may sign up to the treaty arrangements, there are six pages of exemptions, so it is quite confusing.

As a result, at a practical level, the interviewee found it hard to see the utility of the treaty and how the treaty provides added value. Providing some background that led to this result, the interviewee noted that in 2004, the ITAR waiver for the UK was dropped by the U.S. in a political compromise. The interviewee went on to note that in light of the outcome, if the UK government had “five good trouble-shooters” handling the various bilateral issues that arise, the treaty would be superfluous.

It should be noted that one industry representative stated that the treaty implementing details are still to be worked out. Thus, the treaty could be a vehicle for facilitating increased cooperation, possibly allowing, for instance, UK firms that have facilities in the U.S. to work closely with U.S. military facilities. However, that



was the only semi-optimistic note that was sounded about the potential benefits from the treaty.

U.S. Attitudes: Practical Working Relationships

With all of the preceding difficulties, the question arises how anything gets done on JSF or, in general, when ITAR comes into play. The answer from UK representatives is that the difficulties that can arise are often ironed out due to good working relationships. One statement on the Likert scale questionnaire was “U.S. requirements had a significant, negative impact on the working relationship with U.S. officials.” The responses from industry representatives were distributed as follows:

Strongly Disagree										Strongly Agree	Do not Know
1	2	3	4	5	6	7	8	9	10		
(1)	(3)		(2)		(1)						(2)

Average: 3.0

For government representatives, the responses were as follows:

Strongly Disagree										Strongly Agree	Do not Know
1	2	3	4	5	6	7	8	9	10		
(2)	(1)	(1)	(1)			(1)					

Average: 3.0



One industry participant stated that he has regular contact with U.S. government officials on JSF, and there have been no major problems. Indeed, there has been strong support from the U.S. The UK firm had 230–240 people working on the JSF in the U.S. 3–4 years ago, and still has 80 personnel working on the project in the U.S. And the U.S. has a dozen people on-site to work full time on security, supply, and other issues and adjudicate proposed changes. The firm’s personnel in the U.S. have a good relationship with U.S. counterparts. Certainly there are restrictions on UK personnel, but as they have been in the U.S. for a long time, the arrangement works well. The working environment has developed over a lengthy period of time and, certainly in the JSF development phase, U.S. regulations have not been an insurmountable impediment. However, they could be a concern in the future, conceded the interviewee, and the relationship will be tested more as JSF progresses. Basically, U.S. behavior is geared to helping the UK firm despite U.S. regulations. But the UK will need to push the U.S. for more dialogue.

However, another industry representative, while agreeing that resolution of problems comes down to personal relationships, stated that when the firm works directly with Washington, things can get difficult. To a degree, the firm has reasonable relationships with U.S. officials, and generally those individuals have been knowledgeable. The firm works with the JSF project office to resolve problems and issues. In the early stages, however, the firm got little instruction on the regulations, and the U.S. response was “just go read the ITAR.” But as the working relationship developed, there was more U.S. help on getting clarifications.

The UK firm and the JSF project office, noted the interviewee, can also have heated exchanges, mostly due to the delay in getting responses urgently needed by the UK firm. And sometimes the U.S. puts in provisos that the company did not expect, or at times does not even know about. Much depends on the license, and a well-drafted broad scope in the license gives the firm the required flexibility. On issues such as hardware or technical data, the license may be silent, so the company has to work to find a solution. Usually that can be done, but it can take 2–3 months to get that answer out of the U.S. One industry participant noted that the



key was the attitude of the U.S. entity involved. The JSF project office did not generate an “us versus them” culture, nor did Lockheed Martin. However, other U.S. firms generated precisely the “us versus them” culture that made work difficult for UK firms.

For UK government representatives, the general impression was of a cooperative arrangement with U.S. officials. One government participant stated that for the UK in general, the JSF project arrangements work for several reasons:

1. The UK went in big and went in early.
2. The UK provided a substantial amount of up-front money for JSF development (£2 billion).
3. The UK interest in a STOVL supported the interests of the U.S. Marine Corps.
4. The UK also got congressional assurance.
5. UK participation was proof for the U.S. that JSF is an international project.
6. The UK proved that it handles itself in a professional manner and has the respect of the U.S.
7. The UK and U.S. understand each other, speak the same language, and work well together.
8. The UK can provide useful technology.

Another government interviewee stated that there is a good relationship with the U.S. that has been built up over the years. It has reached the point at which the UK is accepted as a partner in the JSF. The U.S. and UK have managed to work practically to address unanticipated problems, but in some instances the U.S. National Disclosure policy has come into effect, which, as opposed to ITAR, is a “hard line” that cannot be worked around. On technology transfer issues, the question is often whether the request has been explained properly by the UK to the U.S. If so, then the system works and requests are granted. For those instances in which the request falls into a gray area, there is willingness on the part of the U.S. to



try to work out a solution. Normally, the system works well and agreement is reached. Even if the issue cannot be resolved at the working level and has to be raised to the political level, a resolution is usually achieved.

As a practical matter, one government representative noted that it is essential that UK personnel working on the JSF get training on how to work with the U.S. government. They need to be aware that they cannot barge into the Pentagon and make requests for technical information. Certainly people get frustrated, but they need to understand how best to work with the system. For that reason, they are always instructed to speak with the UK team working on the JSF before they begin work on the JSF in the U.S. In general, said the individual, the U.S. ultimately will provide the information that is requested if the request and the requirements are laid out clearly to the U.S. (for example, on the urgency of a matter and a need for a quick response).

Another government participant noted that the UK has some 35 people at the JSF project office, Lockheed Martin, and the JSF testing facility. These are UK personnel who are there in place of U.S. staff, not as a supplement to U.S. staff. There have been no problems obtaining clearances for the UK personnel. That has allowed the UK to acquire valuable experience, while also bringing UK experience in areas such as safety and logistics to the JSF project. In general, commented the individual, if the UK wants data to be able to make decisions, it has gotten it from the U.S. The U.S. has welcomed the UK personnel and their contributions. (However, added the interviewee in an aside, while the U.S. is willing to accept UK ideas, it is often most effective to convince the U.S. that the proposal actually is a U.S. idea.) And in some instances, the UK has served as an interlocutor between U.S. Services.

As background, the interviewee noted that the UK emphasized six key concerns that were presented to the U.S. in the System Development and Demonstration (SDD) Memorandum of Understanding (MOU) signed in 2001. Addressing these issues was important for the UK, particularly as it was concerned about the impact of ITAR. In 2006, the UK needed to spell out its specific



requirements for the JSF in the Production, Sustainment, and Follow-on Development MOU. The interviewee added that the U.S. was keen to sign up to that MOU so that it could attract other foreign participation. The UK had spent three years on that effort, working with the U.S. government, Lockheed, and UK firms to generate an extensive, detailed set of over 500 requirements. An additional result was a bilateral agreement at the national policy level. The document was signed at the same time as the 2006 MOU. In the UK view, the bilateral agreement is certainly morally, if not legally, binding. It is not known whether other JSF participating states have completed similar bilateral agreements. Without noting a specific instance, the interviewee noted that the UK raises the bilateral document when necessary, in order to try to resolve disputes. It is important to note that the process for the JSF is new, and there was nothing similar in projects such as Trident. The result is that the UK has a certain level of confidence regarding access to required information on JSF.

UK Attitudes on U.S. Relationship

One government representative reversed the point about attitudes and forcefully asserted that the problem may actually be UK attitudes with regard to its relationship with the U.S. The result is not a problem with what the U.S. requires under its export control and technology transfer regime, but how the UK assesses those requirements, and the assumptions it makes about U.S. actions. In the view of this individual, the UK has such a firm adherence to a policy that it should be with the U.S. and use U.S. material, that this leads to “perverse” results. To cite one example, at the onset of UK participation in JSF, the numbers provided by the UK government did not match the joint project numbers. There were bad UK behaviors driving a policy to spend a “fortune” to buy U.S. equipment and stay in step with the U.S. That UK mentality is critical to understanding questionable UK decisions.

How does the UK decide whether to buy U.S. equipment, asked the interviewee? They are good at calculating the benefits, such as interoperability with the U.S. But the UK does not do a good job calculating the costs of getting U.S.



equipment. Certainly the UK understands the costs of European collaboration, for which they have a healthy skepticism. But that seems to disappear when it comes to assessing collaboration with the U.S.

The interviewee cited the example of the UK acquisition of satellite communications equipment from the U.S. under the FMS program. There was no proven technology and no UK influence over the evolution of the equipment. The UK planned to do the acquisition through a U.S. firm. All of the key negative factors were ignored, and none of them were included in the documentation generated for approval at the Initial Gate and Main Gate decision points in the UK acquisition process. The interviewee stressed that this would never have happened in a European project. There simply is a different mind-set with regard to U.S. projects. Turning to another example, the interviewee stated that the UK does not know what is in the black box for Apache helicopters. Then, the UK finds that the radar does not work in the rain and relies on U.S. promises that it will handle the problem.

The UK, continued the interviewee, does not recognize that off-the-shelf acquisition from the U.S. is not the same as off-the-shelf acquisition from other countries. To take another example, the UK acquired Hercules transports, in which the block upgrades were decided by the U.S. The UK is stuck, as it cannot do anything about Hercules on its own. The nature of the acquisition arrangement is different than buying from France, but the UK government does not seem to recognize that fact. Indeed, at times, the UK seems to think it is simply “buying metal.” It is possible to get a major military capability from the U.S., stressed the interviewee. But access and other issues have to be properly considered by the UK.

On JSF, stated the individual frankly, the UK is ultimately paying a lot of money to be an exporting country, just like any other JSF participating state. There has not been any institutional learning displayed by the UK government. The interviewee’s frank assessment is that the UK will not ultimately get everything it wants from the U.S., and “the UK will not have sufficient operational sovereignty on



the JSF.” But the individual’s perception is that the UK is too far into the project to change course.

Another government representative echoed these points, stating that it would be amazing if any UK government were to actually pull out of the JSF. JSF is a good project, but it obviously has its faults, as shown by problems with the cost and weight of the aircraft. Frankly, said the interviewee, the UK will think twice about going forward on this type of project again. But there is still a problem of people in the UK government not being willing to say “no” or “that is enough” on a major project like JSF, particularly in view of the reaction from the U.S. The individual noted that the UK announcement of a decision as part of SDSR not to acquire the STOVL version of the JSF caused the U.S. Marines to “throw out the UK liaison officer.”

Chairman Arbuthnot echoed those points to a degree, stating that it is important for the UK and U.S. to work together in the defence area, noting that this could mean that the UK would simply buy defense material from the U.S. that it cannot produce itself. But he added that it is important that both nations have capable, competing defense industries. And it is also important that Europe does not have to “knuckle under” to the U.S.



ITAR Free

That last reference by Chairman Arbuthnot led to his strong statements on the move among UK and other European firms to produce ITAR-free items, as noted by Bialos, Fisher, and Koehl (2009, p. 20). Arbuthnot frankly stated that UK industry wants to design around ITAR and proclaim that their items are “ITAR free,” adding that this is something that should generate concern in the U.S. He continued by stating, “In all candour, I would encourage UK industry to design around the ITAR and produce ITAR-free items.” Why, asked Arbuthnot, design something that will become enmeshed in ITAR? European defence cooperation is going forward, and that is not simply due to ITAR concerns. It is a reflection of the benefits that are possible by working closely with an Ally, and is wrecked by ITAR requirements.

One government representative commented that, in general, there is growing sentiment in both foreign governments and non-U.S. firms to do whatever is needed to avoid entanglement with ITAR. Another government interviewee concurred that experience has generated an impetus in UK industry to produce ITAR-free military items. In France, there is a government policy of using ITAR-free items, and the trend is spreading throughout Europe. Another government participant commented that France and Germany have gone to their industries and made clear they want ITAR-free goods, and there is anecdotal evidence that contractors, particularly in Germany and France, have indeed started to design components around ITAR.

One industry representative stated that customers are now asking for and firms are designing ITAR-free items. For large items or older items, that is difficult. But for new items, that is entirely possible. To cite one example, on the A-400M transport, AMSL has asked suppliers for items that are ITAR free. One industry participant commented that for small- and medium-sized firms, it would make sense to do everything possible to avoid ITAR.

However, one government interviewee provided a more nuanced position, stating that with regard to the benefits of ITAR-free goods, the decision has to be



based on a calculation of costs and benefits, and should not be a decision based on policy or past experience. Referring to the French declaration of ITAR-free goods, the individual stated that it is hard to judge how much of French rhetoric is reflected in policy decisions.



Reform of the U.S. System

All of the preceding comments indicate the overwhelming UK government and industry view that even with the most generous perspective of the U.S. system, it is fundamentally flawed. Chairman Arbuthnot stated that it would be better if the U.S. followed what Secretary of Defense Gates is trying to do and generate tighter controls and higher walls on a smaller number of sensitive items. In addition, the number of existing rules must be reduced. Indeed, continued Arbuthnot, there will be a major impact if Secretary Gates is not successful in his efforts to reform the U.S. regime. Difficulties would arise in any event, as the disparity between U.S. and European defense capabilities grow, but reform of U.S. regulations would have a major impact in addressing potential future problems.

One government representative echoed the view that the way to improve ITAR would be to have higher walls on a smaller number of key items. The U.S. has to identify the crown jewels that it wants to protect and then put greater protection around this small set of items. The fact that the ITAR coverage in some instances now goes down to the level of controlling nuts, bolts, and screws is clearly unnecessary. And clearer, simplified regulations would make it easier for small- and medium-sized UK firms to make a decision on whether they want to participate in a U.S. project. With regard to the need for simplified, transparent processes, a single, integrated U.S. agency to make export control decisions is important. Even if the substance of the ITAR were unchanged, a better process would make a major difference. And more reasonable actions by U.S. officials would generate a big improvement, if they removed the small, aggravating instances in which a small mistake generates the return of the entire application.

One industry participant concurred that it would be important for the U.S. to simplify procedures. It would be beneficial if a UK firm could go directly to the U.S. government and say that this is what the firm requires and is requesting. Everyone could then view the certificate and see what is controlled. The UK firm also would



certainly prefer a broad system or list of items, as the problems arise when the U.S. list includes items 1–99, and the item in question is not on the list.

One government interviewee stated that it is important to recognize the constraints in the U.S. political system and the ability to control the levers of power in Washington. As a result, the recommendation is to take decision-making out of the State and Defense Departments and put it in a smaller, more focused body with a single set of policy goals. In short, slim the bureaucracy and give it a focus. In addition, it would be important to get a better business model that assesses risks and benefits (addressed later), all of which would mean a broader, long-term change to the U.S. regime.

Another government representative stated that if the U.S. regime were simply rational, predictable, and fair, it would be more efficient. Again, there are reasons to have technology transfer controls. But not being able, for example, to use tankers due to ITAR coverage of bolt holes is “ludicrous.” The goal is to ensure that the effect of the regulations is to reduce proliferation concerns. Instead, the goal appears to be to generate squabbles and protect self-interest. And as the current U.S. system functions on the belief that everything is vital, that simply increases the chances that truly sensitive items will not get the attention they deserve and will slip through the system.

On that note, one industry interviewee echoed the point that if ITAR were focused on 10–15 technologies that are most sensitive, that would be the best system, particularly for the U.S. Resources could be devoted to protection of key areas, such as stealth and cyber, where there would be more attention in greater detail. That would also result in more relaxation on non-sensitive technologies. It would also be better to have controls focused on destination. These changes, reiterated the interviewee, would benefit the U.S. the most.



One government participant added that there is no problem with having a complex, intensive system for truly sensitive items and went on to provide the following concrete suggestions and improvements:

1. Cut the munitions list. There is no reason for items such as trains to be included.
2. Focus on the items that really need to be protected.
3. Generate more general licenses, particularly open general licenses for friendly governments.

Indeed, said the individual, it is encouraging that the U.S. is considering a general license for JSF support. This would allow the flexibility to move items around under one license. These are the basic structural changes that are needed to make the system efficient and avoid the problems of the negative perceptions of ITAR. Such a step would also address the excessive U.S. staffing to address ITAR requirements that are a result of the U.S. policy.

One industry representative concurred that there have to be regulations on technology transfer, but there has to be flexibility in the system, as well as clarity and consistency of application. None of those are apparent in ITAR. It would be far better to reduce the number of types of licenses and have more all-encompassing licenses. Framework agreements, rather than a multitude of separate licenses, would be more efficient. The individual noted that the U.S. had something close to a framework agreement, but moved away from it due to a concern about non-U.S. firms working together. Another industry interviewee noted that while the UK firm wants to have a “loose” system to give it flexibility, the U.S. regularly has sent applications back with a request for more detail.

Prospects for Reform

Unfortunately, there appears to be substantial pessimism that the Obama Administration efforts to reform the U.S. export control and technology transfer regime will be successful. Drawing on his personal experience, Chairman Arbuthnot



cited one reason for skepticism. He stated that when the UK Defence Committee has gone to Washington to speak to the executive branch about the need to reform a “broken” U.S. system, it is told to talk to Congress. When the members speak to counterparts in Congress, the message to the Committee is to speak to U.S. industry. And when the committee members speak to industry, the response they receive is to talk to the executive branch.

One industry interviewee also expressed pessimism about the chances that the U.S. will improve and simplify ITAR. One government participant provided a detailed rationale for the view that the prospects for export control reform are “poor.” There is no evidence that congressional staff have any concept of how dangerous the current approach is for long-term U.S. interests. The message being delivered to congressional staff is to protect U.S. industry, and Congress appears to buy that message. Moreover, the Obama Administration is still relying on parochial ways of addressing this topic. As a result, the discussion of higher walls around fewer items sounds good, but the UK has heard this message before. Basically, there is a concern that congressional reaction remains an obstacle to serious U.S. reform. Many in Congress are not well-informed about export control and technology transfer matters, and they often act in a manner that is not in the long-term U.S. interest.

Prospects for Reform: Risk

One fundamental difference between the UK and U.S. centers on how to address the issue of risk in controlling sensitive technology. One industry representative stated that the U.S. uses a prescriptive method, while the UK does a risk assessment. A government participant concurred that the U.S. needs to develop a model that assesses risks and benefits. And another government interviewee elaborated on the point that the UK takes a risk-based approach, while the U.S. approach is prescriptive and is based simply on following the rules. The result is a system that is large, unwieldy, and frankly not better than a good system based on risk assessment.



Another government representative put the issue of U.S. tolerance of risk in concrete UK terms, stating that the UK recognizes that at the policy level, the U.S. trusts the UK to properly protect sensitive information and police UK industry. But the UK perception is that at the working level, “the UK is treated the same as Cuba,” due to the fact that the U.S. does not apply any kind of risk management in applying its policies.



THIS PAGE INTENTIONALLY LEFT BLANK



Logistical Support

It appears to be too early in the process for UK representatives to have a concrete view on the general issue of JSF logistical support and the specific issue of whether the ITAR will have an impact. One statement on the Likert scale questionnaire was “I anticipate that U.S. requirements will have a major negative impact on the ability of the UK to provide logistical support for the JSF.” For industry representatives, the responses were as follows:

Strongly Disagree										Strongly Agree	Do not Know
1	2	3	4	5	6	7	8	9	10		
				(1)	(2)		(3)		(1)		(2)

Average: 7.2

For government representatives, the numbers were as follows:

Strongly Disagree										Strongly Agree	Do not Know
1	2	3	4	5	6	7	8	9	10		
(1)	(2)	(1)					(1)	(1)			

Average: 4.1

One industry participant noted that there is no expectation for country-specific solutions regarding JSF logistical support, and the UK and other participating countries will be drawing from the U.S. support network. Global solutions on sustainment requirements will be huge, and it is conceivable that Lockheed Martin will not be able to do it all, so UK and other firms will compete for whatever work is made available to other firms. The interviewee said that UK firms could try to be the regional support lead, but it is too early to tell if that will happen.

Another industry interviewee stated that ITAR plays a role in company planning on JSF logistical support. The U.S. is setting up the rules, which will be global, but there may be hubs around the world and assembly lines in differing countries. Such an arrangement would require ITAR licenses around the world. In



that regard, the interviewee returned to the point noted earlier that the U.S. should keep in mind that other countries, including the UK, have their own licensing regimes and requirements. As noted by government representatives, that could lead to an interesting situation if countries such as Israel are brought in to the JSF. The JSF is unique because of the extensive UK involvement in so many areas. Indeed, noted one individual, it is a partly a UK aircraft.

Interestingly, one government participant commented that on the issue of early work on JSF logistical support, the UK is having fewer problems with the U.S. than with other states. Indeed, at this time, the government does not see risks with regard to JSF support and supplies. There is a public Declaration of Principles with the U.S. that makes it unlikely that the U.S. will refuse to supply the UK with what it needs on the JSF. In general, the UK is looking to establish joint support chains with the U.S., although this could admittedly be tricky on the JSF.

Another government representative stated that work on a variety of fronts regarding the JSF is picking up in intensity. Pilots are now flying test versions of the JSF, logistics and support questions are being discussed, and infrastructure questions for the UK will get more attention. On the general issue of support, the interviewee noted that industry is more concerned than the UK government at this point. The UK is now getting access to what is needed at this time from the U.S. to make decisions on logistical support. Some problems involve coordination with other countries and getting data on systems to assess integration issues. In some cases, other countries have not given data, while the U.S. has provided what the UK has requested. However, with regard to overarching UK support requirements, the individual emphasized that the UK will never send a JSF to the U.S. for service. Such an arrangement will not be acceptable to the UK for basic reasons, such as delay, additional cost (fuel), and complication (tanker refueling).

However, another government participant is not as sanguine on JSF support, noting that the UK will be tied to U.S. decisions in order to support a small number of planes. How this is done will depend heavily on JSF planning, upgrades, and



customizing. In decision papers, the government response is merely that this will be worked out, and the U.S. will make it work. But the UK “is not an equal partner in this game.” To be frank, commented the individual, the U.S. has provided lots of promises in the past and not delivered. Support and upgrade costs are important, and the UK is facing major risks in these areas.

The current arrangement regarding testing was raised as an indication of the challenges the UK might face. One industry representative noted that the current U.S. training centre at Eglin Air Force Base (AFB) is highly secret, and UK pilots do not have access. However, the UK clearly has an interest in ensuring that its pilots have access. How does the UK intend to transfer that knowledge to a national training centre? The requirement is for UK political will to challenge that arrangement at Eglin AFB, as UK pilots are projected to undertake some 500–700 flights annually to meet qualifications.



THIS PAGE INTENTIONALLY LEFT BLANK



ITAR as a Cost of Doing Business

With the minimal prospects for improvement of the U.S. system, the question that arises is the extent to which UK industry simply accepts ITAR as a cost of doing business in the U.S. With the U.S. defence budget currently larger than the defence budgets of the next 20 nations combined, is it simply worth it for UK industry to accept the difficulties inherent in the U.S. export control and technology transfer regime? Reflecting the fact that there is no definitive answer, Chairman Arbuthnot stated that in some circumstances, ITAR makes the cost of doing business with the U.S. too high, while in other cases, it is an acceptable cost. The U.S. has supported the UK in the area of defence cooperation, but parts of the U.S. system generate serious difficulties and disincentives.

The key problem, particularly for small- and medium-sized UK firms, is the general negative perceptions of an inscrutable ITAR process. One industry representative stated that ITAR generates “a certain amount of fear.” In many instances, only 5% of the problem may arise from ITAR requirements, and 95% of the problem is a result of panic. Another industry participant said that small firms probably are influenced by their perceptions of the difficulty of the requirements under U.S. regulations. And one government interviewee noted that perceptions drive behaviors, especially in industry. Those that have worked with ITAR and have experience, added the individual, can make the system work.

From the industrial perspective, the cost of doing business by complying with ITAR highlights the different views of large versus medium and small UK firms. One industrial representative stated that it is important for the individual’s firm to fight for JSF work. There is a significant information technology multiplier, and the payback for the firm, and for the UK in general, is substantial. And the industrial work and the potential income that can be generated are considerable. The final numbers bandied about for the JSF project are around \$400 billion. If, for example, the UK were able to secure 10% of that amount, that would be huge. And again, while the



final arrangements on logistical support are far from being settled, if Lockheed Martin is not able to handle all the support solutions for the JSF, there will be a significant amount of work available for other firms, including UK companies.

The interviewee added that the individual's firm simply needs to work within the U.S. regulations and is big enough to handle them. But for small firms, it is a different matter, as additional personnel and training to specifically handle U.S. regulations is a significant burden, and those perceived costs may be a deterrent. In general, ITAR requirements do not generate questions in the individual's firm about whether it is worthwhile to do business in the U.S. The interviewee thought that small UK businesses would also probably put up with ITAR "if the money is there." However, some suppliers might say the problems generated by ITAR outweigh the benefits and consequently will stay away from entanglement with the U.S. regime.

Another industry participant said that ITAR is onerous and difficult. But as the U.S. is by far the largest defence market, the interviewee's firm and other UK firms want to get part of that business, so they have to work with ITAR requirements. There could be no question about the firm doing what is needed to be in compliance. But the interviewee added that others in the firm saw these as onerous requirements which have generated some resentment in other parts of the company. Also reflecting divided views on the benefits of participating in a U.S.-led project like the JSF, one industry representative noted that the JSF development phase was large, and the work in certain areas could be counted as a success for the UK firm. However, as the firm has not been given access to areas that are viewed as most important for maintaining strategically important capabilities, it remains to be seen what the ultimate benefits for the company will be for participating in JSF.

One industry interviewee added that no firm has said it will not participate in a major U.S. project due to ITAR. But small UK firms, in particular, do not understand ITAR rules about nationality and other issues. Echoing that view, another industry representative stated that small UK firms do not refuse to work on projects due to ITAR, probably because they are not really clear about what ITAR requires. One



industry participant stressed that ITAR forces small- and medium-sized firms into a less flexible position. The key problem is not money, but time, which is the most important factor irrespective of the size of the UK firm. Another industry representative sought to put this in the context of the long-term trend, noting that it is not possible to tell if the UK frustration level with ITAR is growing, because there is still not universal awareness of the requirements.

The views of government representatives on ITAR as a cost of doing business are varied. One government interviewee stated that some UK firms believe they need to be seen to be active in the U.S. and gain access to the U.S. market and technology. But it is not clear the U.S. is ready to treat large UK firms differently than other non-U.S. firms, and the argument could be made that there may well be no major benefit to participating UK firms. As a result, the interviewee believed the price of ITAR is too high in comparison with the levels of U.S. technology to which ITAR provides access.

Another government participant expressed some scepticism about the benefits for UK firms for putting up with ITAR. Within JSF, it is important to ask what Lockheed Martin as the prime contractor actually has done with any ITAR requests from UK firms. What exactly will Lockheed have proposed to the U.S. government for approval? Addressing the issue more generally, there is a good chance the requests of UK firms are thoroughly “scrubbed” by the U.S. firm before putting it to Washington, possibly making it unlikely the UK firm will get what it wants. And that is before the “scrub” done by the U.S. government. As a result, UK firms may not get the technological benefits they anticipate.

The interviewee noted that ITAR is an overhead, a cost of doing business in the U.S. The problem is that companies do not understand all the processes. For UK firms, it is arguably important to get access to the U.S., and ITAR is simply a fact of life. The question is whether there is an appetite among customers for UK firms to participate in U.S. projects, and the argument could be made that such an appetite is declining. ITAR reform by the U.S. would therefore be important in



putting to rest prejudices among small- and medium-sized UK firms about the problems of working in the U.S.

Another government representative noted that some UK firms are reluctant to participate due to bad experiences with ITAR, and some are afraid to touch items unless ITAR-related questions are clearly answered. Indeed, the individual thought that more firms would have come forward with initiatives to develop technology on the JSF, but did not do so as a result of perceptions of ITAR.

Another government interviewee stated that whether ITAR can be viewed as a cost of doing business is a business decision, and the U.S. is certainly a key market. It is possible to understand the cost-of-doing business argument, but the issue is if UK firms understand the risk properly. It is difficult to gauge the argument that ITAR is a necessary frustration. It simply is not militarily or economically desirable for UK firms to say that it is not worth doing business with the U.S. The interviewee tried to balance the competing factors, noting that there are benefits to the UK for participation in JSF, but there are clear negative factors due to time and cost. The interviewee noted that all the other JSF partners complain about why they are not getting their fair share of the work, and the answer they receive is that this is not how the JSF was set up. The three U.S. Services are by far the largest participants in the JSF. From that perspective, the UK has not done that badly in comparison with the other participants. Another government representative echoed the point that other participating states have complained about their work-share, with the UK as well as the U.S. coming in for criticism.

One government interviewee provided the contrasting view that U.S. regulations are a minor irritant and not a major problem and that at least it is a formalized process. Another government representative noted that the specific model used in JSF may not be used again, and may therefore not be the model through which UK firms should view possible future participation. The interviewee stated that the UK is more inclined toward initially bilateral arrangements for future projects, rather than multinational projects. This would allow the possibility of other



countries joining the project once the bilateral arrangements have been sorted out, including a greater emphasis on security of supply chains.

Finally, however, it is important to note that the larger political and commercial question regarding ITAR as a cost of doing business is simple and binary: participate in U.S.-led projects and put up with the difficulties of the U.S. regime, or do not participate. While the interviewees had scores of experiences and anecdotes to illustrate the aggravations of ITAR and the U.S. regime, it is questionable whether the UK is ready to abandon all participation in U.S. projects. One of the statements on the Likert scale questionnaire was “My experience with U.S. export control and technology transfer regulations leads me to question the value of UK participation in U.S.-led defence programmes.” The responses on the industrial representatives were as follows:

Strongly Disagree										Strongly Agree	Do not Know
1	2	3	4	5	6	7	8	9	10		
(3)	(1)	(1)	(1)	(1)		(1)	(1)				

Average: 3.5

The distribution for government representatives was as follows:

Strongly Disagree										Strongly Agree	Do not Know
1	2	3	4	5	6	7	8	9	10		
(2)		(1)	(1)			(1)		(1)			

Average: 4.1

The commentary from the UK participants would have indicated all the responses coming in at 9 or 10. Certainly, the responses of industry participants were driven by the prospects of the business in the U.S. But in general, it is notable that the aggravation and inefficiency generated by the U.S. regime was still not enough for the UK to say, “enough is enough.”



THIS PAGE INTENTIONALLY LEFT BLANK



Key Findings

The responses from UK representatives covered a wide variety of topics and generated a breadth of views regarding U.S. export control and technology transfer regulations. It is clear that the research would have benefitted from more interviews with UK government and industrial representatives. There was also the interesting point (noted later with regard to the topics of “U.S. policy” and “delay”) that the results on the Likert scale questionnaire were somewhat at odds with the clear statements expressed in the interviews. That may reflect the need for additional research with a better “quantifiable” check on the commentary from participants. Despite these weaknesses, the key results of the research were as follows:

Rationale for U.S. Policy—One of the key findings was extensive UK support for the rationale behind U.S. export controls provided in the interviews. While not completely reflected in the numbers, this could be explained by the fact that support for U.S. policy was inseparable from criticism of U.S. practice.

Delay—There was intense criticism of the extent to which the U.S. system generated delays, which was also not indicated in the numbers. The generally cited 6–9 month delay in obtaining a response from the U.S. in connection with JSF work generated additional costs and hampered efficient operations.

Supply Chains—Respondents stressed that the ITAR limited the ability to arrange cost-effective and efficient supply chains for JSF, thus making it difficult to drive down costs, improve security, and generate improvements.

Extra Work—There was considerable UK support for the proposition that ITAR generated substantial extra work on the JSF.

Administration—The extent of administrative costs related to ITAR were outlined along with a view that, while these may be bearable for large UK firms, they may be too onerous for small- and medium-sized enterprises.



Complexity—UK representatives highlighted the complexity of ITAR, as well as the lack of clarity on ITAR provisions and decisions from Washington.

Performance—Another key finding was the UK view that ITAR generated a disincentive to push for new, creative options or technology for JSF and promoted an incentive to simply “play it safe.”

Information-Sharing—There was support for the proposition that U.S. policy established barriers to the sharing of information on JSF, which complicated work, added to cost and delay, and had a negative impact on performance.

Foreign Nationals—Respondents emphasized that the U.S. focus on nationality generated difficulties for UK firms due to UK and EU laws, and made it difficult to draw the best available expertise into projects like JSF.

Working Relationships—The UK interviewees noted that ITAR requirements added “an additional bucket of sand” to complicate working relationships.

IPR—The key findings were (1) the UK perception that the U.S. uses ITAR to protect U.S. IPR, and (2) the UK fear that UK IPR can be “contaminated” by ITAR and limit future use of that IPR, which could occur in JSF.

Excessive ITAR Control—There was UK criticism of what is viewed as the unreasonably excessive reach of U.S. regulations. While acceptable for JSF, the impact of ITAR on items such as Eurofighter raised objections.

Trade Barrier—The data indicated a UK view that the U.S. uses ITAR as a trade barrier and to hinder participation by non-U.S. firms in projects like JSF.

Source Codes—The general finding is that the UK is still waiting to see whether it will get the access it requires to JSF source codes, which clearly remains a key issue for the UK. While there are indications of confidence that this will be resolved to the satisfaction of the UK, there are expressions of concern that the UK



ultimately will not have the kind of access it requires in order to maintain its operational sovereignty.

U.S. Working Relationships—Another key finding was the UK view that the practical working relationship with U.S. officials on JSF is good and resolves problems generated by U.S. policy and process.

Logistical Support—It is still too early to see whether there will be an impact on JSF logistical support from ITAR and U.S. export control policy in general. This is clearly an area in which further research is warranted as the support arrangements for the JSF come into sharper focus.

There were also a number of more general, non-JSF specific points that arose, which clearly affected UK perceptions of the U.S. export control and technology transfer regulations. Those key findings are the following:

Technology—There was a general UK view that the U.S. does not place great value on UK technology. An associated view was that the U.S. does not have a realistic view of the extent of its technological edge over other countries, and whether that edge will be maintained over the long term.

Attitudes—There is also a view that the U.S. implements policy in an “arrogant” manner.

U.S.–UK Treaty—The key finding is that there is a general sense of disappointment in the UK with the results of the treaty and that it has not improved the atmosphere on bilateral defence cooperation.

ITAR Free—One of the key findings, simply put, is that there is substantial support in the UK for designing around ITAR.

Reform of the U.S. System—Another key finding was the strong UK view that the U.S. system must be reformed, with a focus on higher walls around truly



sensitive items and rational, predictable, and fair process. However, there is little optimism about reform, and a view that it will be stymied in Congress.

Cost of Doing Business—The general UK view is that for large firms, ITAR can be viewed as an acceptable cost of doing business, but it is far too large a cost for small- and medium-sized UK firms. But taking a larger perspective, it is not clear that the UK is ready at this time to abandon participation in U.S.-led projects, solely due to ITAR.



Conclusions

In seeking to draw some overarching conclusions from the data provided by UK representatives, it is important to find the right framework in which to place the information. In this instance, it is arguably best to do so by continuously asking the question “compared to what?”

First, most of the commentary is quite negative and indicates a substantial amount of UK dissatisfaction. In that regard, this should be a major concern for the U.S., as the UK is arguably the state that is most open to the idea of participating in U.S.-led multinational military projects. Compared to other nations, the U.S. should anticipate a sympathetic ear in the UK. If this is the extent of UK criticism of the U.S. regime, Washington should dread hearing frank commentary from other countries.

However, the second point of comparison noted previously was that the aggravation generated by the U.S. export control and technology transfer regime is still not great enough for the UK to walk away from U.S. projects like the JSF. But as the attraction of participating in U.S. projects arises from the substantial funding unavailable elsewhere and the opportunity to work on the best technology, the question is the extent to which UK support will continue if U.S. defence budgets fall, and the U.S. technological edge decreases. And again, the final arrangements for JSF logistical support and the extent to which non-U.S. firms will be able to participate are critical factors that will warrant future research. If the long-term benefits for UK firms on JSF support are far less than are anticipated, that will have an impact on the extent of UK enthusiasm for participating in U.S.-led projects and putting up with ITAR.

The third and final comparison is arguably the one which is of greatest utility, particularly to the U.S.: what type of export control regime does the U.S. have, and what should it have? It is important to reiterate that the UK participants recognized the need for the U.S. to regulate sensitive technologies. They had strong support for efforts by the Obama Administration to improve its system in order to enhance



security of truly sensitive technology. Moreover, they had suggestions for practical steps on process that could remove unnecessary complexity and aggravation. Simply put, the U.S. may wish to consider what requirements and processes support a clear policy goal, and which serve to generate ill-will among some of its staunchest supporters.

The U.S. should not take solace from the responses noted previously that the UK is not yet ready to opt out of U.S. military projects. The fact that, even in the UK, there is growing support for producing ITAR-free items should be a concern to Washington. Once again, if that is the extent of the sentiment in the UK, the U.S. should be greatly concerned about views, policy, and practice in France, Germany, and other countries.

In the past, the case could be made that, due to U.S. dominance in military technology and defence spending, other countries and non-U.S. firms were willing to put up with any and all U.S. requirements, no matter how aggravating or onerous. The commentary from UK representatives indicates that may no longer be the case. If the advantages of participation on U.S. projects are indeed diminishing, as is perceived by some UK commentators, it would be in the interest of the U.S. to eliminate the avoidable disadvantages generated by its export control and technology transfer regime. The findings of this research indicate that, from a UK perspective, this would mean a U.S. system that is predictable, simple, fair, transparent, and focused on truly sensitive technology.



References

- Bialos, J., Fisher, C., & Koehl, S. (2009). Fortresses and icebergs: The evolution of the transatlantic defense market and the implications for U.S. national security policy. Retrieved from http://www.acq.osd.mil/ip/docs/fortresses_and_icebergs_vol-one.pdf



THIS PAGE INTENTIONALLY LEFT BLANK



Appendix A

Questionnaire

General

Could you outline your role in the organization? What is the nature of your specific responsibilities with regard to JSF? How long have you been in this position?

Are your comments for attribution?

As a general statement, to what extent did the U.S. export control and technology transfer requirements have an impact on your work on the JSF?

Time/Delays

Did the requirements generate significant delays in receiving information you required from the U.S. government? From Lockheed Martin? From other U.S. sub-contractors working on the JSF? From non-U.S. sub-contractors working on the JSF?

Additional Work

Did the requirements generate additional work?

Did the requirements force you to pursue different or more complicated solutions to problems which arose?

Costs

Aside from time, did the requirements generate additional financial costs?

What form did those additional costs take? Need to develop new solutions? Utilise more costly solutions?



Capability/Performance

Did the requirements have an impact with regard to meeting performance requirements?

Was there an impact with regard to developing new or additional capabilities?

Technology Development

Did the requirements inhibit the development of new technologies on the JSF? The application of existing technologies?

Collaboration and Innovation

To what extent did the requirements hinder collaboration and the opportunity to pursue new ideas with the Pentagon? Lockheed Martin? Other U.S. sub-primes? Other non-U.S. sub-primes?

More generally, to what extent did they hinder efforts to find creative solutions and approaches?

Working relationships

Did the U.S. requirements generate obstacles to performance of routine tasks with the Pentagon? Lockheed Martin? Other U.S. sub-primes? Other non-U.S. sub-primes?

Did the JSF Program Office assist in resolving problems due to the U.S. requirements?

To what extent did these rules and regulations have an impact on the working relationship with U.S. officials? Did they generate friction? If so, did that spill over into areas beyond export control and technology transfer issues?



Required Skill Sets

Did the requirements generate demands with regard to required skills to negotiate with DOD or Lockheed Martin?

Knowledge

Did the requirements restrict your ability to obtain the required knowledge or information to most efficiently do your work on the JSF? If so, how extensive was that restriction?

Organisational Behaviour/Culture

Did the requirements generate a compartmentalized work environment?

How extensive was the sentiment that people had to focus only on their specific area of concern?

To what extent did the requirements generate an “us” vs. “them” culture with regard to DOD officials? Lockheed Martin? Other U.S. sub-primes? Other non-U.S. sub-primes?

Decision-making

Did the requirements have an impact on your ability to make critical decisions? On your ability to make recommendations?

Other Factors

Were there other ways in which the U.S. export control and technology transfer requirements had an impact on your work on the programme?

In your view, were the problems the result of the requirements, or the way in which those requirements were interpreted by the Program Office? By Lockheed Martin?



What impact have the requirements had on the extent of interoperability between U.S. and UK regarding the JSF?

Integrated Logistics Support

Do you anticipate having to use regional logistics and maintenance centres run by Lockheed Martin? What difficulties do you foresee?

Do you have any indication of the additional cost involved with such an arrangement? The extent of delays in support or maintenance?

Have you seen other indications of the U.S. requirements having an impact on logistical support for the JSF?

Other Issues

Are there other issues relating to your experience with the U.S. export control and technology transfer regime and their impact on the JSF and logistics support for the F-35 which you believe are important to note?



Appendix B

JSF SURVEY Date _____ Organization _____ Name (optional) _____

1) U.S. export control and technology transfer requirements had a significant impact on the conduct of my work on the JSF.

Strongly Disagree _____ Strongly Agree _____
 Comments _____
 Do not Know _____

1 2 3 4 5 6 7 8 9 10 _____

2) There was a clear rationale for the U.S. requirements.

Strongly Disagree _____ Strongly Agree _____
 Comments _____
 Do not Know _____

1 2 3 4 5 6 7 8 9 10 _____

3) U.S. requirements generated major delays.

Strongly Disagree _____ Strongly Agree _____
 Comments _____
 Do not Know _____

1 2 3 4 5 6 7 8 9 10 _____





4) U.S. requirements generated substantial additional work.
Strongly Disagree _____ Strongly Agree _____
Comments _____ Do not Know _____
Disagree _____
1 2 3 4 5 6 7 8 9 10 _____

5) U.S. requirements inhibited opportunities to obtain necessary technical data.
Strongly Disagree _____ Strongly Agree _____
Comments _____ Do not Know _____
Disagree _____
1 2 3 4 5 6 7 8 9 10 _____

6) U.S. requirements had a significant, negative impact on the working relationship with U.S. officials.
Strongly Disagree _____ Strongly Agree _____
Comments _____ Do not Know _____
Disagree _____
1 2 3 4 5 6 7 8 9 10 _____



7) U.S. regulations complicated work with other industrial participants.
Strongly Disagree _____ Strongly Agree _____ Do not Know _____
Comments _____
1 2 3 4 5 6 7 8 9 10 _____

8) I anticipate that U.S. requirements will have a major negative impact on the ability of the UK to provide logistical support for the JSF.
Strongly Disagree _____ Strongly Agree _____ Do not Know _____
Comments _____
1 2 3 4 5 6 7 8 9 10 _____

9) My experience with U.S. export control and technology transfer regulations leads me to question the value of UK participation in U.S.-led defence programmes.
Strongly Disagree _____ Strongly Agree _____ Do not Know _____
Comments _____
1 2 3 4 5 6 7 8 9 10 _____

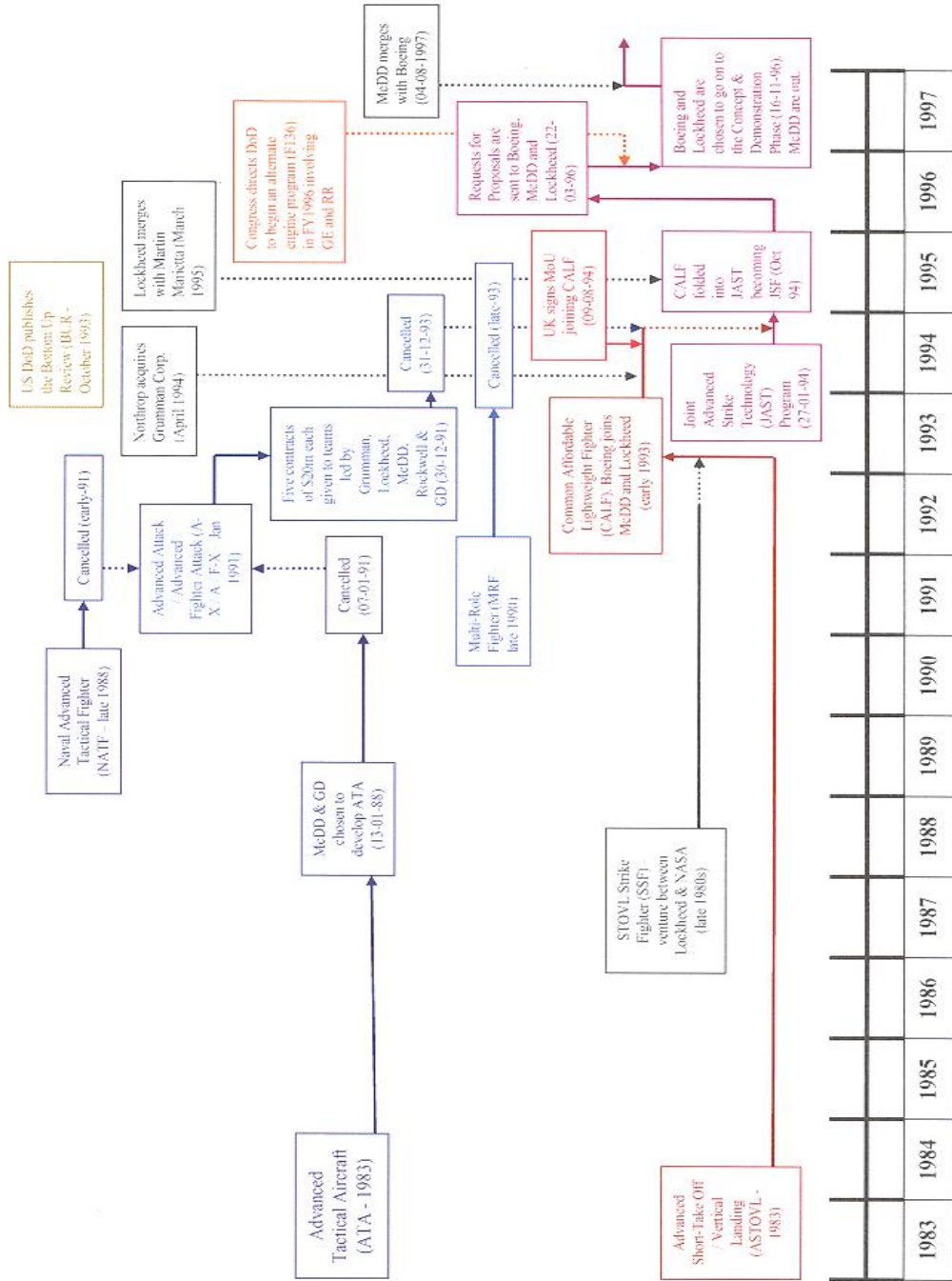
|

THIS PAGE INTENTIONALLY LEFT BLANK



Appendix C

JSF Timeline, 1983-2010



THIS PAGE INTENTIONALLY LEFT BLANK



2003 - 2011 Sponsored Research Topics

Acquisition Management

- Acquiring Combat Capability via Public-Private Partnerships (PPPs)
- BCA: Contractor vs. Organic Growth
- Defense Industry Consolidation
- EU-US Defense Industrial Relationships
- Knowledge Value Added (KVA) + Real Options (RO) Applied to Shipyard Planning Processes
- Managing the Services Supply Chain
- MOSA Contracting Implications
- Portfolio Optimization via KVA + RO
- Private Military Sector
- Software Requirements for OA
- Spiral Development
- Strategy for Defense Acquisition Research
- The Software, Hardware Asset Reuse Enterprise (SHARE) repository

Contract Management

- Commodity Sourcing Strategies
- Contracting Government Procurement Functions
- Contractors in 21st-century Combat Zone
- Joint Contingency Contracting
- Model for Optimizing Contingency Contracting, Planning and Execution
- Navy Contract Writing Guide
- Past Performance in Source Selection
- Strategic Contingency Contracting
- Transforming DoD Contract Closeout
- USAF Energy Savings Performance Contracts
- USAF IT Commodity Council
- USMC Contingency Contracting



Financial Management

- Acquisitions via Leasing: MPS case
- Budget Scoring
- Budgeting for Capabilities-based Planning
- Capital Budgeting for the DoD
- Energy Saving Contracts/DoD Mobile Assets
- Financing DoD Budget via PPPs
- Lessons from Private Sector Capital Budgeting for DoD Acquisition Budgeting Reform
- PPPs and Government Financing
- ROI of Information Warfare Systems
- Special Termination Liability in MDAPs
- Strategic Sourcing
- Transaction Cost Economics (TCE) to Improve Cost Estimates

Human Resources

- Indefinite Reenlistment
- Individual Augmentation
- Learning Management Systems
- Moral Conduct Waivers and First-term Attrition
- Retention
- The Navy's Selective Reenlistment Bonus (SRB) Management System
- Tuition Assistance

Logistics Management

- Analysis of LAV Depot Maintenance
- Army LOG MOD
- ASDS Product Support Analysis
- Cold-chain Logistics
- Contractors Supporting Military Operations
- Diffusion/Variability on Vendor Performance Evaluation
- Evolutionary Acquisition
- Lean Six Sigma to Reduce Costs and Improve Readiness



- Naval Aviation Maintenance and Process Improvement (2)
- Optimizing CIWS Lifecycle Support (LCS)
- Outsourcing the Pearl Harbor MK-48 Intermediate Maintenance Activity
- Pallet Management System
- PBL (4)
- Privatization-NOSL/NAWCI
- RFID (6)
- Risk Analysis for Performance-based Logistics
- R-TOC AEGIS Microwave Power Tubes
- Sense-and-Respond Logistics Network
- Strategic Sourcing

Program Management

- Building Collaborative Capacity
- Business Process Reengineering (BPR) for LCS Mission Module Acquisition
- Collaborative IT Tools Leveraging Competence
- Contractor vs. Organic Support
- Knowledge, Responsibilities and Decision Rights in MDAPs
- KVA Applied to AEGIS and SSDS
- Managing the Service Supply Chain
- Measuring Uncertainty in Earned Value
- Organizational Modeling and Simulation
- Public-Private Partnership
- Terminating Your Own Program
- Utilizing Collaborative and Three-dimensional Imaging Technology

A complete listing and electronic copies of published research are available on our website: www.acquisitionresearch.org



ACQUISITION RESEARCH PROGRAM
 GRADUATE SCHOOL OF BUSINESS & PUBLIC POLICY
 NAVAL POSTGRADUATE SCHOOL

THIS PAGE INTENTIONALLY LEFT BLANK



ACQUISITION RESEARCH PROGRAM
GRADUATE SCHOOL OF BUSINESS & PUBLIC POLICY
NAVAL POSTGRADUATE SCHOOL



ACQUISITION RESEARCH PROGRAM
GRADUATE SCHOOL OF BUSINESS & PUBLIC POLICY
NAVAL POSTGRADUATE SCHOOL
555 DYER ROAD, INGERSOLL HALL
MONTEREY, CALIFORNIA 93943

www.acquisitionresearch.org