Rolls-Royce North America Inc.
Vice President, Global Trade Compliance
1875 Explorer Street, Suite 200
Reston, Virginia 20190, USA
Global Trade Compliance Office
2001 S. Tibbs Ave
Indianapolis, IN 46241, USA

February 7, 2011

Via FedEx/Mail or /Email

Timothy Mooney
Office of Exporter Services
Regulatory Policy Division
Bureau of Industry and Security
Department of Commerce
1401 Constitution Avenue, N.W., Room 2705
Washington, DC 20230

ATTN: Notice of Inquiry – CCL (15 CFR Part 774)

RE: Advanced Notice Proposed Rulemaking: Request for Public Comments on the CCL (75 Fed. Reg. 76,664) (Docket No. 101112562-0577-01)

Dear Mr. Mooney:

On behalf of Rolls-Royce North America Holdings Inc. ("Rolls-Royce") I am pleased to respond to the December 9, 2010 Federal Register Notice requesting comments on (1) descriptions of the items on the CCL and (2) the "tiering" of items on the CCL.

Rolls-Royce has developed and manages numerous technologies and products listed in the Export Administration Regulations. These technologies and products are used in the design, development, manufacture, test, assembly and production of commodities used in Aerospace, Marine and Energy markets. The following ECCNs are a few of the ECCNs utilized in development, production and use by Rolls-Royce (see attached document for an expanded breakdown):

1C007	1E001	1E101
2E003		
9A001	9D003	9E003

Comment One: How to Make the CCL More Clear and "Positive"

The majority of the CCL is defined in a positive manner regarding the ECCNs utilized by Rolls-Royce. The recent modification of 9E003 FADEC language has been extremely helpful. Rolls-Royce would appreciate a similar modification to 9D003. The term "software" is slightly ambiguous as there are multiple levels of software included within the overall control unit.

Rolls-Royce suggests separating out software to include:

- Control Laws;
- Application software source code;
- Application software object code; and
- Operating system software

Each carries a separate set of security controls. This would be consistent with using the Three-Tier system as well. Breaking the overall term "software" down into the listed components would help to make the CCL more positive as this would be clearer to both the exporter and the foreign consignee. Rolls-Royce is happy to provide more technical reasonable to BIS in separate meetings as the majority of the data is proprietary in nature.

Comment Two: The "Tiering" of Items on the CCL

Rolls-Royce agrees with the ideas behind the Three-Tier control system. We believe the tiering concept is significant as much of the technology in Rolls-Royce civil products is exactly the same or very similar to the technology used in military products. The attached list contains Rolls-Royce's placement of the ECCNs captured in the previous table. Most of the ECCNs listed can be separated out into the three Tiers.

The placement into Tier 2 or 3 is based on the following:

- The listed technologies as used by Rolls-Royce in this submission do not give any substantial military capability.
- The listed technologies are used in civil or dual use goods/products.
- The majority have foreign availability.

This does not take into account the modification of the CCL into the Three-Tier system, as is evident in the Materials portion of the CCL (1C). There are certain levels of ceramic matrix composites increasingly being used in gas turbine engines. This is not unique to Aerospace usage, as our Energy business is taking on more of the commercial composite materials. Civil Aerospace in general is using a higher level of composite materials than Energy and Military Aerospace an even higher level. Rolls-Royce expects that these ECCNs will be broken up to segregate the more commercially available from items used uniquely for military platforms.

Military Capability

Rolls-Royce does not believe any of the listed ECCNs fall within Tier 1 as the products and associated technologies are not included in:

- WMD;
- WMD-capable unmanned delivery systems; or
- Plant, facilities or items specially designed for producing, processing or using WMDs

The Three Tiers all list military capability in their definitions. Rolls-Royce believes this point should be clarified as we move forward with export control reform. We realize this is only one factor in each tier's definition; however this will be seen as one of the most important. The products and the technologies do not pose a military advantage based on their use in civil applications including gas turbine engines used for power generation. Rolls-Royce uses the listed ECCNs in dual use products (Rolls-Royce Corporation's AE family of engines) but this is not unique to military platforms and does not give any significant military or intelligence advantage.

Foreign Availability

All the listed products and associated technologies are available in civil and dual use applications. A majority of the ECCNs are listed as being Tier 2. This is based on the availability from regime partners. The US and the regime partners do tend to operate at a higher capability level regarding the listed ECCNs than do non-regime partners. The US and the regime partners may have a competitive advantage at this time, but other non-regime partners are closing the gap. The vast majority are not almost exclusively available from the US and definitely do not provide a critical military advantage to the US.

There are certain capabilities regarding the listed ECCNs for the listed destinations (Argentina, Australia, Austria, Belgium, Bulgaria, Canada, Croatia, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Lithuania, Luxembourg, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, South Korea, Spain, Sweden, Switzerland, Turkey, Ukraine, or the United Kingdom). The attached sheet includes foreign availability (company name and associated country). Russia and China do have limited capability as listed in the attachment although our understanding of the limit of the capability is incomplete.

Rolls-Royce ECCN/Tier Perspective

The attached sheet breaks down the listed ECCNs into respective tiers. The sheet columns are as follows:

- ECCN and description
- Civil engines using respective ECCNs
- Foreign availability
- Engineering notes
- Tier 1, 2 and 3

A majority of the ECCNs listed do not fall under the Tier 1. The attached document delineates each of the ECCNs into the 3 tiers. The attached list of ECCNs includes Rolls-Royce's placement of the technologies within one of the 3 tiers. This is signified by an X in the appropriate column. Those ECCNs that can be broken down into multiple tiers have the separated technologies listed in separate columns. The engine listing is mostly Rolls-Royce products as our internal experience in use of the listed technologies. Rolls-Royce has also included a few other civil variants based on our understanding and public industry knowledge. The specific engineering notes are commentary from Rolls-Royce engineers to help clarify the information provided.

Summary

Rolls-Royce appreciates the opportunity to work with the Bureau of Industry and Security to enhance and evolve US export controls. Rolls-Royce believes the three-tier system will help to clarify controls for both the U.S. exporters/manufacturers and non-US recipients. This submission is meant as an entry level proposal to open the way for additional and in-depth technical discussions.

Sincerely,

William Jeff Merrell
Vice President, Global Trade Compliance
Rolls-Royce North America Inc.

ECCN	DESCRIPTION	Civil engines using items under these ECCNs	Foreign Availability (including names & countries)	Engineering Notes	TIER 1 WMD and items made almost exclusively in the US which provide critical military or intelligence advantage	TIER 2 Items providing a substantial military or intelligence advantage to US, and made by US regine partners and allies	TIER 3 Items broadly available and provide a significant military or intelligence advantage to the US
1C007	Ceramic base materials, non-"composite" ceramic materials, ceramic-"matrix" "composite" materials and precursor materials as follows: **see sheet 2**	None in production CFM56 demo has CMC LP turbine blades	Sulzer Eldin (Netherlands) France - SPS (SiC, C/C CMCs) Germany - SGL (SiC, C/C CMCs) France - SPS (SiC, C/C CMCs) - LP turbine blades (Leap56), exhaust nozzle (M88), nozzle flaps (F100), exhaust plug, mixer, CFM56 combustor. C/C up to 2700C. Germany - SGL (SiC, C/C CMCs) 1C002 - TiAl Institute of Metal Research - China - Centrifugally Cast Impeller MTU - Germany - LP Turbine blades for PW GTF geared turbofan, GENX engine Kyocera - Japan			X	
1E001	Technology according to the General Technology Note for the "development or "production" of items controlled by 1A001.b, 1A001.c, 1A003, 1A004, 1A005, 1A101, 1B (except 1B999), or 1C (except 1C355, 1C980 to 1C984, 1C988, 1C990, 1C991, 1C992, 1C995 to 1C999)						
1E101	Technology in accordance with the GTN, for the "use" of commodities and software controlled by 1A101, 1A102, 1B001, 1B101, 1B102, 1B115 to 1B119, 1C001, 1C007, 1C011, 1C101, 1C107, 1C111, 1C116, 1C117, 1C118, 1D001, 1D101 or 1D103						
2E003	Other "technology", as follows (see List of Items Controlled).						
2E003	a. "Technology" for the "development" of interactive graphics as an integrated part in "numerical control" units for preparation or modification of part programs;	on-machine measure and associated adaptive machinining of Aero engines and other non-aero applications	Siemens NX - Commercially availalble-Europe and other Countries			X	
	b. "Technology" for metal working manufacturing processes, as follows:						
	b.1. "Technology" for the design of tools, dies or fixtures specially designed for any of the following processes: b.1.a. "Superplastic forming"; b.1.b. "Diffusion bonding"; or b.1.c. "Direct acting hydraulic pressing";	RR Trent engines	Rolls-Royce plc - UK (SPF/DB titanium fan blades)			X	
	b.2. Technical data consisting of process methods or parameters as listed below used to control: b.2.a. "Superplastic forming" of aluminum alloys, titanium alloys or "superalloys":	RR Trent engines	Rolls-Royce plc - UK (SPF/DB titanium fan blades)			X	
	b.2.b. "Diffusion bonding" of "superalloys" or titanium alloys: b.2.b.1. Surface preparation; b.2.b.2. Temperature; b.2.b.3. Pressure;	RR Trent engines	Rolls-Royce plc - UK (SPF/DB titanium fan blades)			X	
	b.2.c. "Direct acting hydraulic pressing" of aluminum alloys or titanium alloys: b.2.c.1. Pressure; b.2.c.2. Cycle time;						X

ECCN	DESCRIPTION	Civil engines using items under these ECCNs	Foreign Availability (including names & countries)	Engineering Notes	TIER 1 WMD and items made almost exclusively in the US which provide critical military or intelligence advantage	TIER 2 Items providing a substantial military or intelligence advantage to US, and made by US regine partners and allies	TIER 3 Items broadly available and provide a significant military or intelligence advantage to the US
2E003	b.2.d. "Hot isostatic densification" of titanium alloys, aluminum alloys or "superalloys": b.2.d.1. Temperature; b.2.d.2. Pressure; b.2.d.3. Cycle time;						X
	d. "Technology" for the "development" of generators of machine tool instructions (e.g., part programs) from design data residing inside "numerical control" units;	on-machine measure and associated adaptive machinining of Aero engines and other non-aero applications	Siemens NX - Commercially availalble-Europe and other Countries			X	
	f. "Technology" for the application of inorganic overlay coatings or inorganic surface modification coatings (specified in column 3 of the following table) to non electronic substrates (specified in column 2 of the following table), by processes specified in column 1 of the following table and defined in the Technical Note.					CVD, CVI, PVD PE, PECVD	
9A001	9A001 Aero gas turbine engines having any of the following (see List of Items Controlled).					X	
9A001.a	a. Incorporating any of the technologies controlled by 9E003.a or 9E003.h; or					X	
	Note: 9A001.a. does not control aero gas turbine engines which meet all of the following: a. Certified by the civil aviation authority in a country listed in Supplement No. 1 to Part 743; and b. Intended to power non military manned aircraft for which any of the following has been issued by a Participating State listed in Supplement No. 1 to Part 743 for the aircraft with this specific engine type: b.1. A civil type certificate; or b.2. An equivalent document recognized by the International Civil Aviation Organization (ICAO).					X	
9A001.b	b. Designed to power an aircraft designed to cruise at Mach 1 or higher, for more than 30 minutes.	RR Olympus	Rolls-Royce plc - UK (Concorde eng)			X	
9D003	"Software" specially designed or modified for the "use" of "Full Authority Digital Electronic Engine Control Systems" ("FADEC Systems") for propulsion systems controlled by 9A (except 9A018, 9A990 or 9A991) or equipment controlled by 9B (except 9B990 or 9B991), as follows (see List of Items Controlled).	RR civil products include Trent XWB, Trent 1000, Trent 900, Trent 800, Trent 700, Trent 500, RB211-524, RB211-535, International Aero Engines V2500, AE 2100, AE 3007, BR700, BR725, Tay, FJ44, RR500, M250, and CTS800.	Mannerino SW - Canada Hispano Suiza - France AEC - UK RRD - Germany RR plc - UK Thales - UK HAL - India (under development)	All foreign 'fly-by-wire' or FADEC controlled engines. All foreign countries throughout the world holding said technology including Europe (includes UK, France, Germany, etc), Asia (includes China, Russia, Korea, Japan, Singapore, Malaysia, and Middle East [Israel, Iran, Iraq, Syria], etc), Africa, and of course the Americas.		Control Laws (Unique to specific engines - military or civil) Application Software Source Code (excluding Tier 1)	Application Software Object Code Operating System Software
	9E003 Other "technology" as follows (see List of Items Controlled).						

ECCN	DESCRIPTION	Civil engines using items under these ECCNs	Foreign Availability (including names & countries)	Engineering Notes	TIER 1 WMD and items made almost exclusively in the US which provide critical military or intelligence advantage	TIER 2 Items providing a substantial military or intelligence advantage to US, and made by US regine partners and allies	TIER 3 Items broadly available and provide a significant military or intelligence advantage to the US
9E003	a. "Technology" "required" for the "development" or "production" of any of the following gas turbine engine components or systems:						
	a.1. Gas turbine blades, vanes or tip shrouds, made from directionally solidified (DS) or single crystal (SC) alloys and having (in the 001 Miller Index Direction) a stress rupture life exceeding	Rolls-Royce Trent, Rolls-Royce BRxxx, Snecma Silvercrest (demo), Powerjet SAM146	Rolls-Royce plc - UK (SC & DS) Howmet - UK (SC & DS) Howmet UK and France PCC in the UK at AETC Doncasters in Bochum has SX capability. P&W's facility in Poland is an SX foundry. Rolls-Royce has SX capability in the UK and Italy (civil and military) EMA in Italy manufactures SX IGT bits Snecma may have SX capability in France (military and civil). Precicast has SX capability in Switzerland. Hindustan Aeronautics in Koraput (India) has SX capability. Plants in Russia supporting the Russian engine programs (civil and military) China has three SX plants (Anshun, Shenyang (Liming) and Xi'an (XAE). These are for military bits as there is no civil program at the moment. AIDC in Taiwan may have SX capability as they have an equiax facility.	SX casting is not particularly secret as it can be read about in books. The key is the methodlng knowhow around complex geometries and newer casting alloys.		X	
	a.2. Multiple domed combustors operating at average burner outlet temperatures exceeding 1,813 K (1,540° C) or combustors incorporating thermally decoupled combustion liners, non metallic liners or non metallic shells;	Trent 500, Trent 900, Trent 1000	Rolls-Royce plc - UK (SC & DS)	Thermally decoupled Pedestal Tiles liners		X	
	a.3. Components manufactured from any of the following: a.3.a. Organic "composite" materials designed to operate above 588 K (315°C); a.3.b. Metal "matrix" "composite", ceramic "matrix", intermetallic or intermetallic reinforced materials, controlled by 1C007; or a.3.c. "Composite" material controlled by 1C010 and manufactured with resins controlled by 1C008;	None in production CFM56 demo has CMC LP turbine blades Industrial RB211	France - SPS (SiC, C/C CMCs) - LP turbine blades (Leap56), exhaust nozzle (M88), nozzle flaps (F100), exhaust plug, mixer, CFM56 combustor. C/C up to 2700C. Germany - SGL (SiC, C/C CMCs) Safran - France - 3D woven composite fan blade Sulzer Eldim - Netherlands, manufactures CMC (oxide or SiC/SiC) flaps for F100s (F-16s). Ox/Ox based ceramic liner	Development phase HTOMC's currently used for cases and vanes for F135 and F119 (both P&W in USA)		X	
	a.4. Uncooled turbine blades, vanes, tip shrouds or other components, designed to operate at gas path total (stagnation) temperatures of 1,323 K (1,050°C) or more at sea-level static take-off (ISA) in a 'steady state mode' of engine operation;					X	

ECCN	DESCRIPTION	Civil engines using items under these ECCNs	Foreign Availability (including names & countries)	Engineering Notes	TIER 1 WMD and items made almost exclusively in the US which provide critical military or intelligence advantage	TIER 2 Items providing a substantial military or intelligence advantage to US, and made by US regine partners and allies	TIER 3 Items broadly available and provide a significant military or intelligence advantage to the US
	a.5. Cooled turbine blades, vanes or tip shrouds, other than those described in 9E003.a.1, exposed to gas path total (stagnation) temperatures of 1,643 K (1,370°C) or more at sea-level static take-off (ISA) in a 'steady state mode' of engine operation;	Rolls-Royce Trent, Rolls-Royce BRxxx, Snecma Silvercrest (demo), Powerjet SAM146	Rolls-Royce plc - England and Germany Snecma - France NPO - Russia			X	
	a.6. Airfoil to disk blade combinations using solid state joining; 400 hours at 1,273 K (1,000°C) at a stress of 200 MPa, based on the average property values;	None				X	
	a.7. Gas turbine engine components using "diffusion bonding" "technology" controlled by 2E003.b;	RR Trent engines Tay 611	Rolls-Royce - UK (SPF/DB fan blades) UK, Germany	Diffusion Bonded Trasply cooled liners		X	
	a.8. Damage tolerant gas turbine engine rotating components using powder metallurgy materials controlled by 1C002.b;	Trent 1000, XWB	Rolls-Royce - England (RR1000)			X	
	a.10. Adjustable flow path geometry and associated control systems for: a.10.a. Gas generator turbines; a.10.b. Fan or power turbines; a.10.c. Propelling nozzles; or	WR21	Rolls-Royce - England (variable flow LPT design)			X	
	a.11. Hollow fan blades;	All RR Trent and RB211 fans.	RR - UK			X	
	c. "Technology" "required" for the "development" or "production" of gas turbine engine components using "laser", water jet, Electro Chemical						
	c.1. All of the following: c.1.a. Depths more than four times their diameter; c.1.b. Diameters less than 0.76 mm; and c.1.c. 'Incidence angles' equal to or less than 25 degrees; or	Trent 800, BR710, BR715 Z-Ring liners	UK and Germany	The cooling holes are drilled using Lasers and water jet technologies		X	
	c.2. All of the following: c.2.a. Depths more than five times their diameter; c.2.b. Diameters less than 0.4 mm; and c.2.c. 'Incidence angles' of more than 25 degrees;					X	
003	h. "Technology" for gas turbine engine "FADEC systems" as follows:						

ECCN	DESCRIPTION	Civil engines using items under these ECCNs	Foreign Availability (including names & countries)	Engineering Notes	TIER 1 WMD and items made almost exclusively in the US which provide critical military or intelligence advantage	TIER 2 Items providing a substantial military or intelligence advantage to US, and made by US regine partners and allies	TIER 3 Items broadly available and provide a significant military or intelligence advantage to the US
9E	h.1. "Development" "technology" for deriving the functional requirements for the components necessary for the "FADEC system" to regulate engine thrust or shaft power (e.g., feedback sensor time constants and accuracies, fuel valve slew rate); h.2. "Development" or "production" "technology" for control and diagnostic components unique to the "FADEC system" and used to regulate engine thrust or shaft power; h.3. "Development" "technology" for the control law algorithms, including "source code", unique to the "FADEC system" and used to regulate engine thrust or shaft power.	RR civil products include Trent XWB, Trent 1000, Trent 900, Trent 800, Trent 700, Trent 500, RB211-524, RB211-535, International Aero Engines V2500, AE 2100, AE 3007, BR700, BR725, Tay, FJ44, RR500, M250, and CTS800.	Mannerino SW - Canada Hispano Suiza - France AEC - UK RRD - Germany RR plc - UK Thales - UK HAL - India (under development)	All foreign 'fly-by-wire' or FADEC controlled engines. All foreign countries throughout the world holding said technology including Europe (includes UK, France, Germany, etc), Asia (includes China, Russia, Korea, Japan, Singapore, Malaysia, and Middle East [Israel, Iran, Iraq, Syria], etc), Africa, and of course the Americas.		Control Laws (Unique to specific engines - military or civil) Application Software Source Code (excluding Tier 1)	Application Software Object Code Operating System Software Electronics Hardware, including design details, optimization, manufacturing know how All non-FADEC control system hardware
	i. "Technology" not otherwise controlled in 9E003.a.1 through a.8, a.10, and .h and used in the "development", "production", or overhaul of hot section parts and components of civil derivatives of military engines controlled on the USML					X	