



Billing Code: 5001-06

DEPARTMENT OF DEFENSE

Office of the Secretary

[Transmittal No. 20-06]

Arms Sales Notification

AGENCY: Defense Security Cooperation Agency, Department of Defense.

ACTION: Arms sales notice.

SUMMARY: The Department of Defense is publishing the unclassified text of an arms sales notification.

FOR FURTHER INFORMATION CONTACT: Karma Job at karma.d.job.civ@mail.mil or (703) 697-8976.

SUPPLEMENTARY INFORMATION: This 36(b)(1) arms sales notification is published to fulfill the requirements of section 155 of Public Law 104-164 dated July 21, 1996. The following is a copy of a letter to the Speaker of the House of Representatives, Transmittal 20-06, Policy Justification and Sensitivity of Technology.

Dated: January 17, 2020.

Aaron T. Siegel,

Alternate OSD Federal Register Liaison Officer,

Department of Defense.



DEFENSE SECURITY COOPERATION AGENCY

201 12TH STREET SOUTH, STE 203
ARLINGTON, VA 22202-5408

JAN 09 2020

The Honorable Nancy Pelosi
Speaker of the House
U.S. House of Representatives
H-209, The Capitol
Washington, DC 20515

Dear Madam Speaker:

Pursuant to the reporting requirements of Section 36(b)(1) of the Arms Export Control Act, as amended, we are forwarding herewith Transmittal No. 20-06 concerning the Air Force's proposed Letter(s) of Offer and Acceptance to the Government of Singapore for defense articles and services estimated to cost \$2.750 billion. After this letter is delivered to your office, we plan to issue a news release to notify the public of this proposed sale.

Sincerely,

A handwritten signature in black ink, appearing to read "C. W. Hooper", written over a large, stylized oval flourish.

Charles W. Hooper
Lieutenant General, USA
Director

Enclosures:

1. Transmittal
2. Policy Justification
3. Sensitivity of Technology

Transmittal No. 20-06

Notice of Proposed Issuance of Letter of Offer
Pursuant to Section 36(b)(1)
of the Arms Export Control Act, as amended

(i) Prospective Purchaser: Government of Singapore

(ii) Total Estimated Value:

Major Defense Equipment*	\$1.625 billion
Other	\$1.125 billion
TOTAL	<u>\$2.750 billion</u>

(iii) Description and Quantity or Quantities of Articles or Services under Consideration for Purchase:

Major Defense Equipment (MDE):

Up to twelve (12) F-35B Short Take-Off and Vertical Landing (STOVL) Aircraft
(Four (4) F-35B STOVL Aircraft with the option to purchase an additional
Eight (8) F-35B STOVL Aircraft)

Up to thirteen (13) Pratt and Whitney F135 Engines (includes 1 initial spare)

Non-MDE:

Also included are Electronic Warfare Systems; Command, Control, Communication, Computers and Intelligence/Communication, Navigation and Identification (C4I/CNI) system; Autonomic Logistics Global Support System (ALGS); Autonomic Logistics Information System (ALIS); F-35 Training System; Weapons Employment Capability and other Subsystems, Features and Capabilities; F-35 unique infrared flares; reprogramming center access and F-35 Performance Based Logistics; software development/integration; aircraft transport from Ft. Worth, TX to the CONUS initial training base and tanker support (if necessary); spare and repair parts; support equipment, tools and test equipment; technical data and publications; personnel training and training equipment; U.S. Government and contractor engineering, technical, and logistics support services; and other related elements of logistics support.

(iv) Military Department: Air Force (SN-D-SAE)

(v) Prior Related Cases, if any: None

(vi) Sales Commission, Fee, etc., Paid, Offered, or Agreed to be Paid: None

(vii) Sensitivity of Technology Contained in the Defense Article or Defense Services Proposed to be Sold: See Attached Annex.

(viii) Date Report Delivered to Congress: January 9, 2020

*As defined in Section 47(6) of the Arms Export Control Act.

POLICY JUSTIFICATION

Singapore – F-35B Short Take-Off and Vertical Landing (STOVL)

The Government of Singapore has requested to buy up to twelve (12) F-35B Short Take-Off and Vertical Landing (STOVL) aircraft (four (4) F-35B STOVL aircraft with the option to purchase an additional eight (8) F-35B STOVL aircraft); and up to thirteen (13) Pratt and Whitney F135 Engines (includes 1 initial spare). Also included are Electronic Warfare Systems; Command, Control, Communication, Computers and Intelligence/Communication, Navigation and Identification (C4I/CNI) system; Autonomic Logistics Global Support System (ALGS); Autonomic Logistics Information System (ALIS); F-35 Training System; Weapons Employment Capability and other Subsystems, Features and Capabilities; F-35 unique infrared flares; reprogramming center access and F-35 Performance Based Logistics; software development/integration; aircraft transport from Ft. Worth, TX to the CONUS initial training base and tanker support (if necessary); spare and repair parts; support equipment, tools and test equipment; technical data and publications; personnel training and training equipment; U.S. Government and contractor engineering, technical, and logistics support services; and other related elements of logistics support. The total estimated cost is \$2.750 billion.

This proposed sale will support the foreign policy and national security objectives of the United States. Singapore is a strategic friend and Major Security Cooperation Partner and an important force for political stability and economic progress in the Asia Pacific region.

This proposed sale of F-35s will augment Singapore's operational aircraft inventory and enhance its air-to-air and air-to-ground self-defense capability, adding to an effective deterrence to defend its borders and contribute to coalition operations with other allied and partner forces. Singapore will have no difficulty absorbing these aircraft into its armed forces.

The proposed sale of this aircraft and support will not alter the basic military balance in the region.

The prime contractors will be Lockheed Martin Aeronautics Company, Fort Worth, Texas, and Pratt and Whitney Military Engines, East Hartford, Connecticut. There are no known offset agreements proposed in connection with this potential sale.

Implementation of this proposed sale will not require the assignment of any additional U.S. Government or contractor representatives to Singapore.

There will be no adverse impact on U.S. defense readiness as a result of this proposed sale.

Transmittal No. 20-06

Notice of Proposed Issuance of Letter of Offer
Pursuant to Section 36(b)(1)
of the Arms Export Control Act

Annex
Item No. vii

(vii) Sensitivity of Technology:

1. The F-35B Short Take-Off and Vertical Landing (STOVL) aircraft is a single-seat, single-engine, all-weather, stealth, fifth-generation, multirole aircraft. It contains sensitive technology including the low observable airframe/outer mold line, the Pratt and Whitney F135 engine, AN/APG-81 radar, an integrated core processor central computer, mission systems/electronic warfare suite, a multiple sensor suite, technical data/documentation, and associated software. Sensitive elements of the F-35B are also included in operational flight and maintenance trainers.

a. The Pratt and Whitney F135 engine is a single 40,000-lb thrust class engine designed for the F-35 and assures highly reliable, affordable performance. The engine is designed to be utilized in all F-35 variants, providing unmatched commonality and supportability throughout the worldwide base of F-35 users. The Short Takeoff and Vertical Landing (STOVL) propulsion configuration consists of the main engine, diverter-less supersonic inlet, a three (3) Bearing Swivel Module, Roll Posts and Duct Assembly System, and Lift Fan.

b. The AN/APG-81 Active Electronically Scanned Array (AESA) is a high processing power/high transmission power electronic array capable of detecting air and ground targets from a greater distance than mechanically scanned array radars. It also contains a synthetic aperture radar (SAR), which creates high-resolution ground maps and provides weather data to the pilot, and provides air and ground tracks to the mission system, which uses it as a component to fuse sensor data.

c. The Electro-Optical Targeting System (EOTS) provides long-range detection and tracking as well as an infrared search and track (IRST) and forward-looking infrared (FLIR) capability for precision tracking, weapons delivery, and bomb damage assessment (BDA). The EOTS replaces multiple separate internal or podded systems typically found on legacy aircraft.

d. The Electro-Optical Distributed Aperture System (EODAS) provides the pilot with full spherical coverage for air-to-air and air-to-ground threat awareness, day/night vision enhancements, a fire control capability, and precision tracking of wingmen/friendly aircraft. The EODAS provides data directly to the pilot's helmet as well as the mission system.

e. The Electronic Warfare (EW) system is a reprogrammable, integrated system that provides radar warning and electronic support measures (ESM) along with a fully integrated countermeasures (CM) system. The EW system is the primary subsystem used to enhance situational awareness, targeting support and self-defense through the search, intercept, location, and identification of in-band emitters and to automatically counter IR and RF threats.

f. The Command, Control, Communications, Computers and Intelligence/Communications, Navigation, and Identification (C4I/CNI) system provides the pilot with unmatched connectivity to flight members, coalition forces, and the battlefield. It is an integrated subsystem designed to provide a broad spectrum of secure, anti-jam voice and data communications, precision radio navigation and landing capability, self-identification, beyond visual range target identification, and connectivity to off-board sources of information. It also includes an inertial navigation and global positioning system (GPS) for precise location information. The functionality is tightly integrated within the mission system to enhance efficiency.

g. The aircraft C4I/CNI system includes two data links, the Multi-Function Advanced Data Link (MADL) and Link 16. The MADL is designed specifically for the F-35 and allows for stealthy communications between F-35s. Link 16 data link equipment allows the F-35 to communicate with legacy aircraft using widely distributed J-series message protocols.

h. The F-35 Autonomic Logistics Global Sustainment (ALGS) provides a fully integrated logistics management solution. ALGS integrates a number of functional areas including supply chain management, repair, support equipment, engine support, and training. The ALGS infrastructure employs a state-of-the-art information system that provides real-time, decision-worthy information for sustainment decisions by flight line personnel. Prognostic health monitoring technology is integrated with the air system and is crucial to predictive maintenance of vital components.

i. The F-35 Autonomic Logistics Information System (ALIS) provides an intelligent information infrastructure that binds all the key concepts of ALGS into an effective support system. ALIS establishes the appropriate interfaces among the F-35 Air Vehicle, the warfighter, the training system, government information technology (IT) systems, and supporting commercial enterprise systems. Additionally, ALIS provides a comprehensive tool for data collection and analysis, decision support, and action tracking.

j. The F-35 Training System includes several training devices to provide integrated training for pilots and maintainers. The pilot training devices include a Full Mission Simulator (FMS) and Deployable Mission Rehearsal Trainer (DMRT). The maintainer training devices include an Aircraft Systems Maintenance Trainer (ASMT), Ejection System Maintenance Trainer (ESMT), Outer Mold Line (OML) Lab, Flexible Linear Shaped Charge (FLSC) Trainer, F135 Engine Module Trainer, and Weapons Loading Trainer (WLT). The F-35 Training System can be integrated, where both pilots and maintainers learn in the same Integrated Training Center (ITC). Alternatively, the pilots and maintainers can train in separate facilities (Pilot Training Center and Maintenance Training Center).

k. Other subsystems, features, and capabilities include the F-35's low observable airframe, Integrated Core Processor (ICP) Central Computer, Helmet Mounted Display System (HMDS), Pilot Life Support System, Off-Board Mission Support (OMS) System, and publications/maintenance manuals. The HMDS provides a fully sunlight readable, bi-ocular display presentation of aircraft information projected onto the pilot's helmet visor. The use of a night vision camera integrated into the helmet eliminates the need for separate Night Vision

Goggles (NVG). The Pilot Life Support System provides a measure of Pilot Chemical, Biological, and Radiological Protection through use of an On- Board Oxygen Generating System (OBOGS); and an escape system that provides additional protection to the pilot. OBOGS takes the Power and Thermal Management System (PTMS) air and enriches it by removing gases (mainly nitrogen) by adsorption, thereby increasing the concentration of oxygen in the product gas and supplying breathable air to the pilot. The OMS provides a mission planning, mission briefing, and a maintenance/intelligence/tactical debriefing platform for the F-35.

2. The Reprogramming Center is located in the U.S. and provides F-35 customers a means to update F-35 electronic warfare databases.

3. If a technologically advanced adversary were to obtain knowledge of the specific hardware and software elements, the information could be used to develop countermeasures, which might reduce weapon system effectiveness or be used in the development of a system with similar or advanced capabilities.

4. A determination has been made that Singapore can provide substantially the same degree of protection for the sensitive technology being released as the U.S. Government. This proposed sale is necessary to further the U.S. foreign policy and national security objectives outlined in the Policy Justification. Moreover, the benefits to be derived from this sale, as outlined in the Policy Justification, outweigh the potential damage that could result if the sensitive technology were revealed to unauthorized persons.

5. All defense articles and services listed on this transmittal have been authorized for release and export to the Government of Singapore.

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