AerospaceDaily & DEFENSE REPORT

AVIATION WEEK Intelligence NETWORK

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Inside:

Range Instrumentation

The U.S. Air Force has completed first flight of a new and improved range instrumentation system, the service announced on Aug. 24. A Lockheed Martin F-22 integrated with the Common Range Integrated Instrumentation System (CRIIS) achieved first flight on Aug. 5 at Edwards AFB, California, the Air Force said. The CRIIS will replace the aging Advanced Range Data System, which entered service in 1990. CRIIS will be deployed next on several other platforms, including the Lockheed F-35, Boeing F-15, Lockheed F-16 and Boeing F/A-18E/F.

Daily Briefs

BELARUSIAN MINISTRY OF DEFENSE reportedly signed contract for the delivery of a first batch of an undisclosed number of Mil Mi-35M attack helicopters.

NORTHROP GRUMMAN has $44.5m U.S. Navy contract for 228 H-1 Tech Refresh Mission Computers, increasing quantity from 545 to 773.

U.S. STATE DEPT. approved $63m foreign military sale to Japan of 32 AIM-120C-8 Advanced Medium Range Air-to-Air Missiles and support.

RAYTHEON has $10.2m U.S. Navy contract for integration/testing of modified Cryptographic Modernization Tactical Air Command Network 1.0 data link radio onto the air-to-ground missile 154C-1 Joint Standoff Weapon.

LOCKHEED MARTIN has $7.5m U.S. Navy contract for Intel Diminishing Manufacturing Sources parts for F-35 fighters.

PROGRAMS

South Korean F-35 Buy Reportedly To Expand With Carrier Plan

KIM MINSEOK, themaxium@gmail.com

BRADLEY PERRETT, perrett@aviationweek.com

SEOUL, BEIJING—South Korea reportedly has expanded its requirement for additional Lockheed Martin F-35 Lightnings to 40 aircraft from 20, as the defense ministry refines plans for a ship to carry some of them.

Enlargement of the intended F-35 force is being driven by the plan to build an aircraft carrier, which in turn looks like a measure for competing with Japan.

Following South Korea's 2014 order for 40 F-35As, the next batch of Lightnings will comprise 20 F-35Bs, according to local newspaper the Joongang Ilbo. Although they will be bought for naval purposes, the air force will operate these aircraft, that publication and others reported. Later, the air force will get the 20 additional F-35As that it has wanted for the past six years, according to the Joongang Ilbo.

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The papers did not report timing, but the defense ministry may want to finish receiving F-35Bs by around 2026, as Korea Aerospace Industries ramps up delivers of the KF-X indigenous fighter. It may also need to order F-35Bs early to secure data needed for designing a ship to operate them.

The government is expected to announce the schedule for an F-35B order in October. The ministry's Defense Acquisition Program Administration (DAPA) has set no final plan for orders for either F-35 version, according to the Segye Ilbo newspaper.

The air force's longstanding requirement is called F-X 4. Last year an industry source said the 20 aircraft in that batch could be of the F-35B version, which is capable of short takeoff and vertical landing (STOVL) and is therefore suited to operating from flattop ships lacking catapults.

But the Republic of Korea Air Force does not want to pay for the navy's aircraft, an official close to the air force said. Instead, it wants to go back to buying its own F-35As and let the navy pay for the F-35Bs. So the navy's campaign for a ship capable of operating airplanes is creating pressure for a formerly unplanned fighter purchase.

The Republic of Korea Navy has campaigned since the 1990s for such a ship, a step up from the flattop LPH assault ships Dokdo and Marado, which can only support helicopters. But the service made little headway until Japan said it would convert two helicopter carriers into aircraft carriers.

A day after Japanese media reported in 2018 the possibility of buying F-35Bs for the helicopter carriers, South Korea's Yonhap news agency said the defense ministry in Seoul was looking at buying six such aircraft for naval operation.

As the Japanese program was confirmed, South Korea last year reportedly added provision for F-35B operation to a landing helicopter dock (LHD) assault ship that it planned to build by 2030.

A five-year defense acquisition plan issued on Aug. 10 revealed that the LHD had morphed into an aircraft carrier—that is, a ship designed mainly for operating aircraft, lacking major provision for landing soldiers. Displacement will be in the 30,000-ton class, the ministry said.

The ship, called a light aircraft carrier, will defend the sea area around South Korea and maritime transport routes, help South Koreans abroad and generally protect the rights of the country, the ministry said.

The ministry intends that the ship will be launched in 2030 and enter service in 2033, a source familiar with official planning said. Light displacement will be 30,000 tons and the ship will displace 40,000 tons when fully loaded, according to the Chosun Ilbo newspaper. In fact, an even greater displacement is suggested by dimensions published by the Chosun Ilbo: length 260 m (853 ft.) and "width" 40 m. The LHA assault ship USS America is 257 m long, has a beam (hull width, ignoring overhangs) of 32 m and displaces 45,000 tons fully loaded.

Choi Hyun-ho, a professional military columnist, criticized South Korea's proposed acquisition. "There are two main problems with light carriers," he said. "One, the navy is short of manpower, and aircraft carriers will worsen that difficulty.

"The other problem is the uncertainty of the strategic objectives," he continued. "The navy has not explained what threats the aircraft carrier will deal with and for what purpose."

But according to Boo Hyung-wook, a senior researcher at the Korea Institute for Defense Analyses (KIDA), an aircraft carrier will

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PROGRAMS

U.S. Space Force Tests New SATCOM Anti-Jam Capability

LEE HUDSON, lee.hudson@aviationweek.com

The U.S. Space Force has completed a milestone test for the mitigation and anti-jam enhancement (MAJE) capability part of the Wideband Global SATCOM (WGS) program.

Adaptive nulling and detection features were tested, and the technology passed 165 requirements, according to an Aug. 26 Space and Missile Systems Center statement. The test demonstrated MAJE's ability to suppress interference when contested, while the detection testing measured whether the system could detect simulated interference based on power level and frequency.

MAJE comprises software and hardware upgrades for the U.S. Army's Global SATCOM Configuration Control element ground system that performs detection, geolocation, identification, and mitigation of unwanted radio frequency energy on the WGS 1-10 satellites.

The spread of the novel coronavirus forced Army and Space Force personnel to conduct testing virtually. The equipment was at Boeing's Mission Operations Support Center in Colorado Springs.

The next test event is scheduled this fall and will focus on the systems' geolocation ability. "MAJE will double the anti-jam SATCOM capabilities for six geographic combatant commands," Col. John Dukes, geosynchronous polar orbit division senior materiel leader, said in a statement.

PROGRAMS

Angara A5 To Fly With New Booster In 2021

MAXIM PYADUSHKIN, mpyadushkin@gmail.com

MOSCOW—The first launch of Russia's Angara A5 heavy rocket with a new booster is planned for 2021.

The head of Russian space agency Roscosmos, Dmirty Rogozin, was quoted by the TASS newswire saying that the main purpose of the launch is to test the new Persei (Perseus) booster.

"Both the [Angara's] government customer—the Defense Ministry—and Roscosmos are very interested in this new booster," he said.

Proton

Persei is derived from the DM booster used on heavy Proton launch vehicles. The variant adapted by Energia Corporation for Angara will have the designation 14S49. It is powered by a kerosene-oxygen 11D58MF main engine with a thrust of 5,000 kg (11,000 lb.) in vacuum.

The launch with Persei will be the third for the Angara A5, which first flew in 2014. Previously it used a Briz-M booster. Rogozin said the launch could also be the first one with a commercial payload.

"We offer to all our partners including universities and private companies to give their spacecraft for this third launch as the dispatching cost will be minimal," he said. He also mentioned that another heavy Angara might be ready for launch in 2021.

The Angara A5 test program will include five launches. Development is to be completed in 2022, when the Russian defense ministry is expected to give a green light to begin serial production in Omsk. Rogozin confirmed that Roscosmos already has a contract with the defense ministry for four rockets.

Khrunichev

Roscosmos has also signed a contract with Khrunichev Space Center to develop a modernized Angara for launches from Vostochny spaceport in Russia's Far East. It will have more powerful RD-191M engines powering the first stage and a unified control system for all three stages.

"The rocket will become lighter and more powerful," Rogozin said. "This enables [it] to orbit not less than 27 tons of payload to low Earth orbit." Angara can currently deliver 24 tons from Plesetsk.

Roscosmos also plans to develop an Angara-A5V variant with a third stage using nitrogen as a fuel. The corporation is building a launchpad for Angara in Vostochny that will also accommodate the A5V version.

Rogozin also said Roscosmos will continue to develop the lighter Angara 1.2. It has a launch mass of 171 tons and can carry up to 3.5 tons to low Earth orbit. It was first launched in 2014. The corporation is building two more test rockets, with the next launch planned for 2021. A contract for serial-production vehicles will be signed after the flight trials, Rogozin said.

Preceding the Persei flight will be another Angara launch this autumn from Plesetsk. The rocket modules were transported to the spaceport in Northern Russia in mid-August.

PROGRAMS

FlightSafety Wins TH-73A Helo Aircrew Training Services Deal

LEE HUDSON, lee.hudson@aviationweek.com

The U.S. Navy has awarded a $220 million, five-year base contract to FlightSafety Services for aircrew training services (ATS) to support the TH-73A helicopter program.

FlightSafety will provide 18 flight simulation training devices (FSTD) beginning in 2021-2026. The total contract value is about $363 million. The Navy said two companies vied for the contract, but did not disclose the other vendor.

"This ATS contract is a key component to the Advanced Helicopter Training System because it provides contract instructors and state-of-the-art FTSDs for the new Leonardo TH-73A helicopters," Capt. Holly Shoger, naval undergraduate flight training systems program manager, said in an Aug. 25 statement.

The TH-73A will be used to train Navy, Marine Corps and Coast Guard rotary and tiltrotor pilots at Naval Air Station Whiting Field in the Florida panhandle through 2050.

Separately, in June Navy instructor pilots began learning to fly the TH-73A trainer at Leonardo's facility in Philadelphia.

The new training helicopter is slated to reach initial operational capability in 2021. Leonardo will manufacture 130 TH-73As.

The Navy selected Leonardo's proposal despite the company being underbid by Airbus by $85 million. Airbus filed a bid protest with the U.S. Government Accountability Office (GAO) over the service's decision to select Leonardo to manufacture a training helicopter to replace the aging TH-57 Sea Ranger.

GAO determined Airbus' allegation that the Navy did not accurately access certain technical aspects was "without merit." Leonardo's trainer also beat out Bell's Model 407GXi.

FUNDING & POLICY

Artemis Accords Evolving, NASA Official Says

MARK CARREAU, mark.carreau@gmail.com

HOUSTON—NASA is making progress with potential partner nations on the set of principles known as the Artemis Accords for governing future efforts to establish a sustained human presence on the Moon and then Mars, a NASA official says.

But the official also said it would be premature to offer specifics on which countries were involved in the deliberations and how a summary of the accords, released in mid-May, is evolving into individual bilateral agreements.

The assertion was made by Mike Gold, NASA's acting associate administrator for international and interagency relations, while speaking during an Aug. 26 virtual presentation before the Space Court Foundation.

Gold stressed that NASA is committed in its deliberations to respect the principles for avoiding conflict outlined in the 1967 Outer Space Treaty, which has more than 120 international signatories. Many are not engaged in human space exploration or only beginning to do so.

"We are making some excellent progress. I can say I'm extremely pleased with the response to the accords," Gold said.

Under a March 2019 White House directive, NASA is to return to the lunar surface with astronauts in 2024, four years earlier than the timetable it was previously pursuing.

Part of the agency's strategy to establish sustainability is the assembly of a lunar-orbiting, human-tended Gateway. The outpost would be assembled in an orbit giving astronauts arriving aboard NASA's Orion crew capsules access to a range of lunar landing sites not possible during Apollo.

NASA is pursuing Intergovernmental Agreements (IGAs) to assemble the Gateway, Gold said. They are similar to those established with 15 countries in 1998 for the International Space Station. He specifically mentioned talks with the European, Canadian and Japanese space agencies.

NASA is working with commercial companies under initial Human Landing System contracts to develop a means to transport astronauts from lunar orbit to the Moon's surface.

The accords are to provide principles for how NASA and its international partners operate beyond the Gateway on the lunar surface, Gold said.

"This is a give and take. This is a dialogue," he said. "Unfortunately, I can't talk specifics, and the reason I cannot talk specifics is a good one. We don't want to get ahead of ourselves because we are still talking to partners about what the text should be and we respect their input."

In general, the accords attempt to prevent conflict, reduce risk by seeking openness in registering the nature and location of lunar surface activities. They also seek to develop standards for interoperability among hardware and operating systems, open sharing of scientific findings and the respecting of regions with historic value, such as the Apollo landing sites.

A notable concern raised since the accords were released is a provision supporting a right by exploration initiatives to seek out and make use of lunar resources. This includes large deposits of water ice in permanently shadowed craters at the north and south poles that could be mined for the production of liquid hydrogen and oxygen rocket propellants and life support needs.

Though he withheld specifics, Gold believes the discussion process is improving the objective of the accords, which is to preserve principles outlined in the widely supported Outer Space Treaty.

"We created some draft text, and I can tell you it is substantially improved from the feedback we received from international partners. It is still evolving from everything we have seen. My hope is that you don't have to wait too much longer before additional announcements and perhaps seeing some text," he said.

Gold explained some of his reserve is based on respect for individual exploration objectives.

"In each country, there will be an annex for a specific activity that we are doing. But because the agreement will belong as much to the partner as it does to us, we can't come out right now with the draft text because the text is not finished yet. We are still negotiating. They have great ideas, great feedback. The accords will belong to the partners as much as they do to us."

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make possible "joint warfare from the sea," greatly improving the maritime power of navy. Also, the budget has room for paying for such a ship, Boo wrote in the Korea Times.

The ministry published a picture of a flattop warship with its announcement, but this depicted either the originally planned LHD or a ship not really optimized as an aircraft carrier. Looking much like the America class, it lacked an aircraft carrier's usual overhanging flight deck and even a ski jump, which any navy but the U.S. Navy would regard as essential for STOVL operation.

When the LHD was designed, the South Korean navy demanded high commonality with the America class, an industry source said.

The aircraft carrier will cost KRW2 trillion ($1.6 billion) and its F-35Bs KRW4 trillion, the Chosun reported. According to the Segye, it will carry about 10 F-35Bs.

Staff

EDITORIAL
2121 K Street, NW, Suite 210, Washington, DC 20037
+1-202-517-1100 awin.aviationweek.com

EDITORIAL STAFF
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Assistant Editor Andy Savoie
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Fax: +1-800-455-3145
Email: tech_assistance@aviationweek.com

INTELLIGENCE AND DATA SERVICES
Managing Director Anne McMahon
Tel: +1-646-291-6353, anne.mcmahon@aviationweek.com
Senior Director, Business Development Thom Clayton
Tel: +44 (0) 20 7017 6106, thom.clayton@aviationweek.com

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User Engagement Laurie Grossman
Tel: +1-646-233-4434, laurie.grossman@aviationweek.com
Online access to Aerospace Daily & Defense Report is available at awin.aviationweek.com

ADVERTISING
Sales Director Melissa Crum
Tel: 913-284-2951, melissa.crum@informa.com

REPRINTS
Wright's Media
Tel: 1-877-652-5295 (within U.S.)
Tel: 1-281-419-5725 (outside U.S.)
informa@wrightsmedia.com

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SUPPLIERS

Rolls-Royce Targets Disposals As COVID-19 Ravages Revenues

TONY OSBORNE, tony.osborne@aviationweek.com

LONDON—Aero-engine manufacturer Rolls-Royce is looking to sell off assets as the impact of the coronavirus crisis on the travel industry bites deep into the company's finances.

The British engine-maker said it has identified "a number of potential disposals" that would allow the company to generate proceeds of £2 billion ($3 billion), including Spanish aero-engine firm ITP Aero.

Rolls suffered pre-tax losses of £5.3 billion for the first six months (H1) of 2020 through June, the company announced Aug. 27. This included write-offs of £1.1 billion and £2.6 billion from foreign exchange hedging contracts. The company made an operating loss of £1.7 billion compared to a profit of £200 million the same time last year.

Most of the losses were a direct result of the impact of COVID-19 on the company's civil aviation business, which has led to reductions in flying hours, maintenance revenues and new engine orders.

Rolls CEO Warren East said the pandemic had "significantly affected our 2020 performance," and that the company was now taking steps to increase liquidity.

"In light of ongoing uncertainty in the civil aviation sector, we are continuing to assess additional options to strengthen our balance sheet to enable us to emerge from the pandemic well placed to capitalize on the long-term opportunities in all our markets," East said.

East said a restructuring of the company's Civil Aerospace business was making "significant progress," with the aim of reducing the civil aerospace business' headcount by 8,000 along with another 1,000 personnel from the company's central functions. Some 4,000 people had already left the company in 2020 by Aug.27, with the remaining 5,000 expected to have left by the end of the year.

The changes also include the consolidation of widebody engine assembly and test from three sites in the UK to one, at Derby, England. Trent fan blade production currently performed in Barnoldswick, England and in Singapore will be consolidated to the company's Singapore site. Advanced disc and turbine blade machining will be focused on the UK. Blisk production will transfer from the current three sites to two, in Derby and Oberursel, Germany.

Rolls also confirmed the departure of its chief financial officer, Stephen Daintith, who resigned to take up another opportunity. The CFO will remain in the role long enough to support an orderly transition to oversee £1 billion of cost-cutting.

The engine-maker said it is on target to deliver around 250 engines during 2020, having delivered 137 engines in H1, but noted that flying hours from those engines under long-term service agreements had been reduced by 47%, although business jet and regional flights were less severely impacted. In its outlook, the company said there will be a gradual recovery in flying activity to 70% of 2019 levels by 2021 and around 90% by 2022—Rolls said this was its base case scenario "where there is assumed to be no second wave."

Large engine deliveries will remain at around 250 a year through to 2022, with the company optimistic about returning to positive cash generation in 2022.

PROGRAMS

Russia Nears Su-57 Production, Orders Su-30SM2 Upgrades

PIOTR BUTOWSKI, butowski@post.pl

Russia's Sukhoi Su-57 multirole fighter aircraft, years in the making, is nearing the start of production.

However, the ramp-up will still take several years, especially in light of the military's effort to squeeze the program's manufacturing and operating costs. In the meantime, the United Aircraft Corp. subsidiary's Far Eastern production facility will remain focused on the export-intended Su-35.

Russia's defense ministry is concluding its decade-long state armaments program this year and is negotiating a new round of contracts for aircraft. On Aug. 12 Defense Minister Sergei Shoigu visited two of United Aircraft's fighter manufacturers—in Komsomolsk-on-Amur in Russia's Far East and Irkutsk—promising to purchase new aircraft.

During Shoigu's visit to the assembly hall in Komsomolsk, the company rolled out the second preliminary series Su-57, or T-50S-2 (T-50 is the internal designation for Su-57 prototypes and T-50S is the initial production version). Since the first aircraft, T-50S-1, crashed on Dec. 24, 2019, during a delivery flight, the first aircraft the Russian Aerospace Forces will receive will be the T-50S-2.

The T-50S-2 on display was still not fitted with at least one of the engines, some covers were not yet in place, and it had a makeshift radar nose cone. The tail fins were a bit of a mystery: they wore a pixel camouflage typical of Su-57 prototypes, while the rest of the aircraft was still unpainted. This raises the question: Were the fins from another, earlier aircraft?

The aircraft was to be moved to the flight station on Aug. 20, according to Alexander Pekarsh, director of the plant in Komsomolsk. "By Oct. 30, it is to be handed over for operations." The airplane will likely go to the 23rd Fighter Air Regiment at Dzyomgi, which is also the airfield of the Komsomolsk plant, to ease qualified maintenance.

According to a chart presented to Shoigu, the T-50S-2 will be the only Su-57 made this year, while the plan for 2021 envisions the production of four. Volume is expected to increase in the following years. In July 2019, the defense ministry placed an order for 76 Su-57s for delivery by 2028.

Shoigu stressed during his visits to Komsomolsk and Irkutsk that purchase prices and operating costs are of key importance

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FUNDING & POLICY

UK Calls For Consensus On Responsible Use Of Space

TONY OSBORNE, tony.osborne@aviationweek.com

LONDON/ANKARA—The UK has launched a draft UN resolution on the responsible use of space, as concern grows about the potential impacts to national economies if space-based infrastructure is damaged through accidents or misunderstandings between nations.

The British government is hoping the resolution will broker international consensus for responsible behavior in space.

The decision to pursue the resolution follows UK and U.S. criticism of Russia following an apparent test of an in-orbit, anti-satellite (ASAT) weapon conducted by Moscow in July.

British Foreign Secretary Dominic Raab said the UK was taking the lead on a global discussion on responsible space behavior because of growing concerns that a space arms race or conflict could have "catastrophic consequences."

"Many countries use military space systems to control battlefield communications, defensive and offensive missile systems and even their nuclear forces," Raab said. "These systems are vulnerable to attack by space and Earth-based weapons systems, interference and malign cyber activity. When countries don't communicate about their intentions in space or act in a threatening way, the risk of retaliation increases."

British officials note that while weapons of mass destruction have been banned in space for more than 50 years, there are no constraints on a new generation of weapons and technologies that can damage or destroy space-based systems from the ground or in space. Such capabilities are proliferating beyond the major powers. India carried out a test of its Shakti anti-satellite weapon in March 2019.

There is concern that such actions could inadvertently create debris that could go on to damage communication or navigation satellites on which the global economy has a growing dependence.

Officials note that talks remain stalled as current proposals do nothing to prevent attacks on satellites from the Earth. They suggest the UK approach could break the impasse at the UN and lead to greater transparency and reduce the risk of miscalculation between nations that could lead to conflict.

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to the military. Pointing to the Su-57 price chart, he told industry representatives: "The lower [the price] goes, the stronger our friendship with you will be." He called for a reduction in flight-hour costs and for contracts covering the life cycle of an aircraft.

Production of the first T-50 airframe of 2010 required 785,000 manhours. The T-50S-2 required just 247,000 hr. In 2022-23, the labor required for one Su-57 airframe is predicted to drop below 200,000 hr. and hit 146,000 hr. by 2028. By comparison, the production of one Su-35S requires 120,000 hr. A program to improve the quality of material is also being implemented. Production of one Su-57 requires 78 tons of aluminum and 16 tons of titanium; the target is 64 and 14 tons, respectively. The plant has started managing Su-57's production flow.

With Su-57 production just beginning, the main product in Komsomolsk remains the Su-35/Su-35S (the Su-35 is for export). According to Pekarsh, in 2020, the Su-35S makes up 42% of total production (including remanufacturing); export deliveries of the Su-35 constitute 31%; and the Su-57 handovers are 20%. The remaining 7% is devoted to civil production: the fuselage and outer wing panels for the SSJ-100 passenger aircraft.

The defense ministry earlier ordered two batches of the Su-35S: 48 fighters were completed in 2011-16 and 50 were delivered in 2016-20. Pekarsh says this year, the factory will deliver the last of 10 Su-35S fighters expected from the second contract, adding: "We delivered four airplanes in June; three will be handed over in September and three in November." The chart presented to Shoigu shows a previously unknown contract for six Su-35S fighters for delivery in 2021-22; perhaps it is an order to supplement retired aircraft.

According to Pekarsh, the plant has a full load for this year and next year. However, he explained, for financial stabilization in 2022-24, "it is necessary to contract 20 Su-35S aircraft soon."

Shoigu says, "We plan to conclude an additional state contract for the supply of multifunctional Su-35S aircraft. The contract amount will be 70 billion rubles."

This indicates the price of one Su-35S is 3.5 billion rubles or $47 million. The export price is much higher. Indonesia's now-canceled order from 2018 for 11 aircraft was worth $1.14 billion, or $104 million apiece.

The financial stability of the facility in Russia's Far East has an important social context. The plant employs 9,600 people in a city with a population of 250,000. Therefore, a large part of Shoigu's meeting was devoted to employment stability. During his visit, the defense minister was accompanied by the new governor of the Khabarovsk administrative district, where protests have been going on for weeks.

An interesting question is why the government is buying Su-35S fighters for "financial stabilization" rather than Su-57s. Perhaps the Russian Aerospace Forces or VKS do not want to increase the order for the Su-57 until the planned modernized "M" (T-50M) version with new engines enters production. The updated fighter is expected to enter service in the middle of this decade, Deputy Defense Minister Aleksey Krivoruchko has said.

During the defense minister's visit, there was no talk of export orders. However, in the long run, the market for the Su-35 is abroad. Russia does not plan further orders after the current "stabilizing" contract for 20 fighters.

The first foreign buyer, China, received 24 Su-35 fighters in 2016-18. Indonesia ordered its 11 in February 2018. But the country terminated the contract due to U.S. pressure resulting from the Countering America's Adversaries Through Sanctions Act.

In the chart shown to Shoigu, export production of the Su-35 was presented in two lines, suggesting there are two export contracts. Within one of them, 22 Su-35s are to be delivered this year, and eight more in the next year. Almost certainly, this customer is Egypt, which is known to have signed a contract for such a tranche of Su-35s in March 2018. In July of this year, five Su-35s without any nationality markings, but in a paint scheme similar to that of other Egyptian Air Force aircraft, were spotted in Russia.

The second Su-35 export contract remains a mystery. According to the chart, that contract provides for the delivery of 12 aircraft in 2022, 14 in 2023 and, probably, six-eight in 2024 (the picture is blurred) for a total of 32-34. The customer could be China again. Other countries known to have negotiated for the purchase of Su-35s are Algeria, the United Arab Emirates and Vietnam.

Shoigu held a similar conference at the Irkutsk Aviation Plant and declared the defense ministry would order 21 Su-30SM2 fighters and 25 Yak-130 jet trainers. The contracts are to be worth "over 100 billion rubles" ($1.4 billion) in total. Such orders mean more than a year of work at the Irkutsk plant.

The contract for Su-30SM2s is particularly interesting, as such a previous modification is unknown. In 2016, Sukhoi launched a Su-30SM upgrade program, which provided for a new computing system, improved radar antenna, more powerful transmitter and new Khibiny-U self-defense suite. The weaponry was to be expanded with new Kh-31M, Kh-35U and Kh-38M air-to-surface missiles, as well as heavy "izdeliye 620" air-to-air missile prototypes. Most likely, the Su-30SM2 is an aircraft modernized according to this program.

One more update program is shown in the Su-30SM(D), in which the 12.5-ton AL-31FP turbofans are replaced with 14.5-ton AL-41F-1S engines from the Su-35 (hence the D, Dvigatyel, engine, in the designation). The first Su-30SM(D) retrofitted with AL-41F-1S engines is ready, but it has not yet started flight tests.

Aviation Week Forecasts

Global F-16 MRO Demand 2020-2029

Following the announcement on Aug. 14 that Taiwan's order for 66 Lockheed Martin F-16 Block 70 fighter had been finalized by the U.S. Department of Defense, a new maintenance, repair and overhaul (MRO) center is set to open in the country.

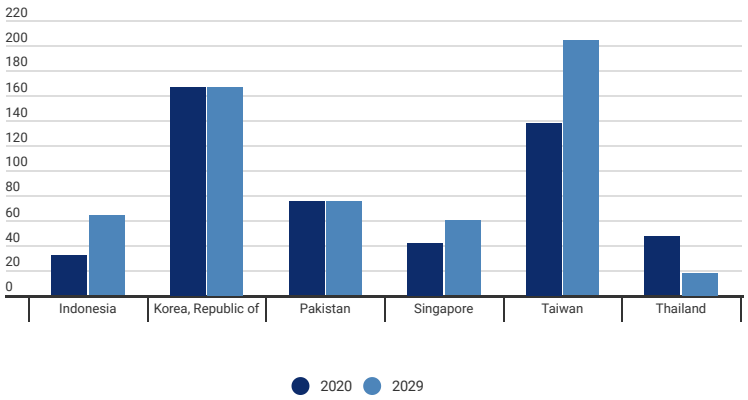
While the new facility ostensibly is being established to conduct maintenance on the Republic of China Air Force's growing fleet, which is now set to grow to 204 aircraft by 2029, it also is hoped the center will attract business from around the Asia-Pacific region.

At present, 519 aircraft are operated by the air forces of Indonesia, Pakistan, Singapore, South Korea, Taiwan and Thailand, equivalent to around 19% of the global fleet. However, with Aviation Week Network forecasting that Asia's in-service fleet of F-16s will have increased to 588 by 2029, and with fleets in Europe and North America declining, the Asia-Pacific will be home to 26% of the active fleet by the end of the decade.

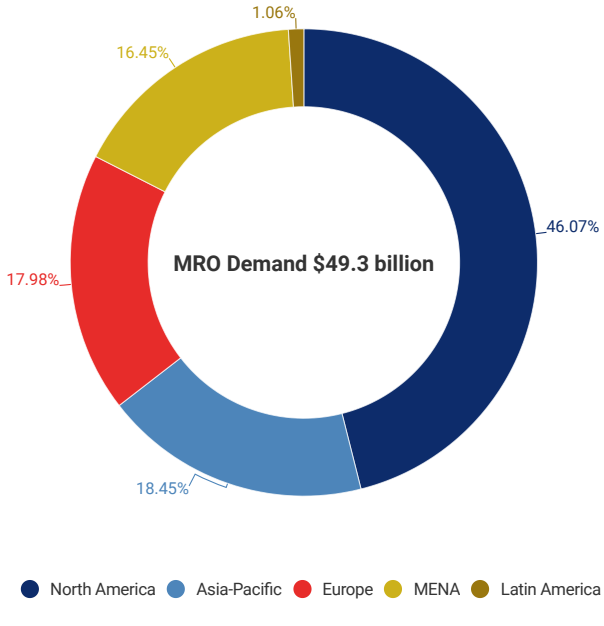
In total these Asia-based F-16s are projected to generate $9.1 billion in MRO demand over the decade, providing a potentially lucrative market for the new Taiwan-based facility. It will compete with the Korea Aviation Engineering and Maintenance Service (KAEMS) center, which also provides F-16 MRO in the region supporting Korean and U.S. Air Force aircraft in the country.

Globally the F-16 fleet is expected to generate $49.3 billion in MRO demand over the next 10 years even as it shrinks from 2,792 aircraft in 2020 to 2,278 by 2029. However, with the F-16 program having secured additional sales to Bulgaria, Morocco, Slovakia and Taiwan in recent years and the Pentagon placing a 10-year indefinite delivery/indefinite quantity contract for Foreign Military Sales valued at up to $62 billion, deliveries of new aircraft are anticipated throughout the next decade.

F-16 In Service Fleets In Asia-Pacific



F-16 Global MRO Demand 2020-2029



Source: Aviation Week Intelligence Network (AWIN) 2020 Military Fleet & MRO Forecast

For more information about the 2020 Forecast and other Aviation Week data products, please see: http://pages.aviationweek.com/Forecasts

Prepared by Craig Caffrey.