



Open Source Update: April 2023

**Intelligence & Analysis Division
Open Source Update**

April 2023

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Threats

Russia Hosts Multilateral Arctic Exercises – Foreign Nation-State Military (FNSM)

Summary

Russia hosted the multilateral Safe Arctic 2023 exercises across nine (9) regions of the country's Arctic zone during 06 and 07 April. Participants included nine (9) non-Arctic nations from Africa, Latin America, and elsewhere in Eurasia. The exercises were intended to demonstrate rescue methods as well as vehicles, aircraft and other types of domestically-produced equipment. Moscow also dispatched a 12-day research expedition to test equipment in the Arctic climate. The exercises were conducted as part of Russia's chairmanship of the eight-nation Arctic Council from 2021-2023. The other seven (7) nations boycotted the exercises. Full cooperation via the Arctic Council ceased following Russia's invasion of Ukraine last year. The United States, Canada, Denmark, Finland, Iceland, Norway, and Sweden have continued to coordinate their efforts without Russia. While the Safe Arctic 2023 exercises were not necessarily military in nature, they demonstrated Moscow's interest in leveraging partnerships with non-Arctic nations to secure its interests there, even though they may not share borders. It is unknown if regional cooperation with Russia that includes the seven (7) other member nations of the Arctic Council will resume in the future.

Analyst Comment

With Finland joining NATO, and Sweden set to join soon, Russia will be the only Arctic state that is not a member of the alliance. This will expand NATO's borders with Russia and enhance cooperation among member states. Sixteen (16) NATO states already participated in the month-long Arctic Forge exercise that concluded on 17 March 2023. Without support in the region, the Kremlin is also encouraging Chinese, Indian and Middle Eastern companies to invest in Arctic initiatives that formerly involved Western firms. This includes a possible trans-Arctic container shipping road along the Northern Sea Route from New Delhi to Europe. If secured with the cooperation of India, this would further cement the involvement of nations from outside of the region. The U.S. Department of Defense (DoD) has installations near the Arctic Circle, including Pituffik Space Base in Greenland and Joint Base Elmendorf-Richardson, Clear Space Force Station, Eielson Air Force Base, Fort Wainwright and Fort Greely, all in Alaska. The DoD released its 10-year National Strategy for the Arctic Region in October 2022. The plan includes four (4) pillars, the first of which is enhanced U.S. military presence and increased cooperation with partner nations. Russia has reopened and modernized hundreds of installations in the Arctic since the U.S. released its last strategy in 2013. The presence of foreign-nation state military assets and personnel from outside the region will present an ongoing challenge to the seven (7) remaining member nations of the Arctic Council as they consider a future without Russia's involvement.

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North Korea Hacking Group Targets Cryptocurrencies – Cyber

Summary

In January, the FBI reported it was able to confirm the Lazarus Group (APT38) was responsible for the attack on the so-called Horizon Bridge in June 2022. Hackers stole \$100 million worth of cryptocurrencies in the attack. Traders use the Horizon Bridge to swap digital tokens between different blockchain networks. The FBI also noted that following last year's attack, the attackers used the Railgun system to launder over \$60 million worth of the token Ether that had been stolen. Ether is the native token used by the Ethereum blockchain and network as a payment system for verifying transactions. The Railgun system is designed to help preserve the anonymity of people moving cryptocurrency. A portion of the stolen Ether was sent to several virtual asset service providers and converted to Bitcoin.

Analyst Comment

When the attack occurred, there were immediate indications that the Lazarus Group (a hacking group linked to the North Korean government) was behind the attack. The latest attack is just one of many cyberattacks carried out by the group. In 2022, North Korean acquired over \$1 billion worth of cryptocurrencies. That same year, the Lazarus Group was identified as the likely perpetrators of a \$620 million heist on the Ronin Network. In 2021, North Korean hackers stole almost \$400 million from cryptocurrency platforms, and a majority of these attacks were conducted by the Lazarus Group. Cumulatively, Lazarus has been accused of stealing \$571 million from cryptocurrency exchanges between January 2017 and September 2018 and \$316 million from 2019 to November 2020. Earlier attacks by the group include in the "WannaCry" ransomware attacks, the hacking of international banks and customer accounts, and the cyberattack on Sony Pictures in 2014.

North Korea has used stolen and laundered cryptocurrency to fund its missile and nuclear programs for several years. However, fluctuations in cryptocurrency markets and the collapse of the world's second-largest crypto exchange, FTX, may have depleted North Korea's funds. For example, Chainalysis (a blockchain/cryptocurrency analysis firm) estimated North Korea had holdings of multiple cryptocurrencies worth \$170 million in December 2021. These had not been converted into cash. Those same holdings were estimated to be worth \$65 million in June 2022. The exact gains and losses depend heavily on the date when the funds were acquired and the type of cryptocurrency, as the value of each currency shifts constantly. Any funds held by the country that have not been cashed

out (converted to traditional fiat currency) are likely to be held until the price of the relevant cryptocurrency increases.

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FAA Makes Regulatory Changes to Unmanned Aerial Systems

— *Unmanned Aircraft-Unmanned Aerial Systems (UA-UAS)*

Summary

There has been a rapid proliferation of commercial unmanned aerial systems (UAS; or “drones”) for recreational, business, scientific, and government use over the past decade. In light of this, the Federal Aviation Administration (FAA) intends to increase regulatory control of these systems to maintain aviation safety nationwide. Among of the most significant updates is the implementation of Remote Identification (RID). These updated regulations take effect on 16 September 2023.

RID will require small UAS (anything over 250 grams or .55 pounds) to broadcast certain information that can be received by other parties, similar to transponders aboard manned aircraft. The broadcasted information includes individual UAS identification, location of both the unit and its control station, altitude, time, and the emergency status of the UAS. Broadcasted information will not include payload types such as pictures, videos, or thermal imagery.

Exemptions to the RID regulations include UAS operated by the Federal Government and those designed for aeronautical research. State, local, and tribal government agencies operating UAS must comply with the new regulations.

Analyst Comment

The impacts of these changes will be felt beyond the sphere of aviation safety. UAS activity has been reported at a number of DoD installations which could be indicative of malicious activity, including foreign intelligence collection, smuggling contraband, disruption of operations, pre-planning for terrorist attacks and civil disturbance, and use of UAS to deliver small explosive devices.

Most UAS flights are not malicious, even if they inadvertently cause a disruption. Registration of UAS and the use of RID will help mitigate such incidents, including flights by hobbyists or aviation enthusiasts who unwittingly breach protected airspace.

Potential threat actors may attempt to circumvent these regulations and fly without registration or RID. The new regulations allow authorities to detain noncompliant operators and investigate them, including notifying federal authorities if and when a situation warrants as much. These new regulations will also give DoD security personnel the tools to distinguish malicious UAS flights from legitimate operations when accompanied by proper training and implementation.

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National Guard Veteran Arrested for Terror Plot – *Terrorism*

Summary

In early February 2023, a National Guard veteran and a female companion were arrested for allegedly plotting to damage electrical substations in the Baltimore, MD area. According to an FBI affidavit, the couple was charged with conspiring to secure a firearm and “put holes” through transformers at five (5) energy substations. The former Guardsman, a self-identified neo-Nazi, was released from prison in 2021 following a 2018 conviction for the possession of an unregistered destructive device and improper storage of explosive materials. In 2015, the former Guardsman started his own neo-Nazi group, called Atomwaffen Division (AWD). The group is well-known to both law enforcement and experts on extremism.

According to law enforcement and the Anti-Defamation League (ADL), AWD is a U.S.-based racially or ethnically motivated violent extremist group with cells in multiple states. The group’s targets have included racial minorities, the Jewish community, the LGBTQ community, the U.S. Government, journalists, and critical infrastructure. In addition, open-source reports indicate that AWD has international ties. In July 2020, following the arrests of the National Guard veteran and other AWD members, the group rechristened itself as the National Socialist Order (NSO).

During an investigation into the 2017 murder of two (2) of his roommates (in which a third roommate was found to be guilty) authorities discovered that the National Guard veteran had plotted to attack power lines along “Alligator Alley” and a nuclear power plant in Florida. Starting in June 2022, he sent encrypted messages to an FBI informant. He encouraged him to attack critical infrastructure, including sniper attacks against substations and using Mylar balloons to short out a power transformer. Using an online pseudonym, the former Guardsman’s female companion introduced herself to the FBI informant in January 2023. She was also previously arrested in 2006 for multiple offenses, including armed robbery. Their contact with the source resulted in their arrest and federal charges for conspiracy to destroy an energy facility.

Analyst Comment

This incident highlights the growing threat of both extremist groups in the U.S. and among active-duty and veteran servicemembers. On 05 February 2021, the U.S. Secretary of Defense announced a department-wide standdown to address the problem of extremism in the ranks. According to the research collected from the Profiles of Individual Radicalization in the United States (PIRUS) database, from 1990 through July 2022, at least 545 individuals with U.S. military backgrounds committed criminal acts that were motivated by political, economic, social, or religious goals. More specifically, over 30% of the subjects in PIRUS with military backgrounds espoused views supporting white supremacy, white nationalism, and/or xenophobia. In addition, PIRUS data indicates that 82 subjects (about 15%) were serving on active duty, reserve duty, or in the National Guard at the times of their arrests.

A Department of Homeland Security bulletin released on 30 November 2022 warned that domestic violent extremists pose a heightened threat against critical infrastructure targets in the U.S. On 17 January 2023, just weeks after two (2) power substations were hit by gunfire in Moore County, NC, a power substation in Thomasville, NC, was found damaged by an apparent gunshot. Furthermore, on 25 December 2022, four (4) substation attacks impacted thousands of customers in the Tacoma, WA, area. A DoD installation, its assets, and its personnel could be severely impacted by a substation attack that results in power outages.

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Shooting at Coronado Naval Base Gate – Crime

Summary

On 17 March 2023, a vehicle entered the main access control point of the Coronado Naval Base, Naval Air Station North Island. The driver was later identified as an off-duty San Diego County Sheriff's deputy. The deputy behaved aggressively towards installation gate guards and refused to follow instructions. Then, he attempted to drive onto the installation without proper authorization.

Guards opened fire on the vehicle after it breached the gate. A witness residing nearby reported that he heard sirens followed by approximately 10 shots fired. No one was injured. The deputy was taken into custody and charged with driving under the influence by local authorities and released, pending a hearing. He is currently on administrative leave during an internal investigation by the San Diego County Sheriff's Office. The Naval Criminal Investigative Service is also examining the incident. The entire base was placed on lockdown and the main entrance remained closed into the next day during the investigation.

Analyst Comment

It is unclear why the final denial barrier was not used to prevent the accused from entering the installation. Final denial barriers are mechanical devices within the control zone of an access control point that can be raised to stop vehicles. The possibilities include a mechanical malfunction, slow reaction time by guards, or a lapse in training.

Access control point operations are inherently dangerous. The vast majority of those entering an installation are authorized personnel, their families, and cleared visitors. However, there is nothing to stop curious citizens, activist demonstrators, and even threat actors from approaching an installation. Guarding a gate can become routine and mundane for personnel, fostering complacency. Servicemembers may also lack adequate experience, or they may be posted at the installation entrance as a reprimand for infractions.

As the first point dividing the installation from the community, public-facing entrances are often the site of initial contact during an incident. Previous incidents at CONUS installation entrances include shootings, explosive detonations, terrorist attacks, civil disturbances, and emergencies wherein civilians arrive seeking assistance. As a percentage of gate traffic, these incidents are rare, but when they occur, they pose a significant risk to the installation, its assets, and its personnel.

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Increase in Fentanyl Deaths Among DoD Personnel – Narcotics

Summary

Recently published DoD data indicated that fentanyl was involved in about 52% of fatal overdose (OD) cases in the military between 2017 and 2021. Over this period, the DoD noted that fatal fentanyl overdoses increased from 36% in 2017 to 88% in 2021. Of the 332 fatal drug overdoses from 2017-2021, fentanyl and fentanyl analogs were the only drugs reported in 73 cases, while one (1) or more other drugs were taken in combination with fentanyl and its analogs in 101 cases.

Further analysis of the DoD data indicates that active-duty OD deaths were relatively unchanged from 2017 to 2019 but slightly increased in 2020 and 2021. Among the services, the Army reported 171 fatal OD cases, comprising 51% of all OD deaths from 2017-2021. Comparatively, the Air Force, the Marine Corps, and the Navy recorded 45, 36, and 80 OD deaths, respectively. Also, of the fatal drug overdoses, servicemembers accidentally overdosed in 84% of cases, while approximately 12.7% of incidents were ruled a suicide. Ultimately, overdose deaths made up about 7% of all military deaths from 2017 to 2021.

In addition to the 332 fatal drug overdoses reported, the DoD noted 14,961 non-fatal OD cases from Fiscal Year (FY) 2017-2022. Most of these non-fatal OD cases were deemed intentional (6,345), accidental (4,624), or undetermined (2,021). Of the non-fatal overdoses from 2017-2021, the Navy, the Air Force, and the Marine Corps recorded 1,930 (20%), 1,577 (17%), and 1,183 (12%) cases, respectively. The Army had the most non-fatal overdoses compared to the other services, reporting 4,793 cases (50%) from 2017-2021.

Analyst Comment

In addition to the increase in active-duty OD deaths in 2020 and 2021, the CDC also noted an increase in national drug overdose deaths. According to the CDC, U.S. overdose deaths increased from 93,655 to 107,622 from 2020 to 2021. Furthermore, from 2020 to 2021, overdose deaths involving synthetic opioids, including fentanyl, increased from 57,834 to 71,238. Considering this information, the recently published DoD data reveals that 59% of continental U.S. overdose deaths from 2017-2021 occurred in the 10 states with the largest military populations.

As indicated by the recent increase in fatal OD cases, illicit narcotics use remains a significant issue among active duty servicemembers and the entire U.S. population. However, open-source data suggests active-duty servicemembers and veterans could be more likely to use illicit narcotics compared to the general population. According to the most recent Health Related Behaviors Survey (2021), which was developed to understand the health, health-related behaviors, and overall well-being of servicemembers in 2018, illicit drug use amongst active-duty DoD personnel was substantially higher than among the general population. In addition, in October 2019, the National Institute on Drug Abuse indicated that more than one (1) in 10 veterans had been diagnosed with a substance use disorder, which is slightly higher than the general population. Ultimately, the National Institute on Drug Abuse notes that the “stresses of deployments and the unique culture of the military offer both risks and protective factors related to substance use among active-duty personnel.” Nevertheless, the DoD highlights that drug abuse significantly affects total force readiness.

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Camp Blaz Activation on Guam Met With Protest – *Civil Disturbance*

Summary

With its commandant and Guam’s governor in attendance, the Marine Corps held a second activation ceremony on 26 January 2023 for its first new installation on the island in 70 years. Marine Corps Base (MCB) Camp Blaz is still under construction just west of Andersen Air Force Base, after a soft activation in October 2020. Completed projects include several barracks, an aviation maintenance hangar, firing ranges, and critical infrastructure. The installation is expected to receive approximately 5,000 Marines within the next several years. While no date has been set for a transfer of forces from Okinawa to Guam, it will likely begin in the mid-2020s.

The 4,000-acre base was named in honor of the late Marine Brig. Gen. Vicente “Ben” Tomas Garrido Blaz, who was a Guam native. The installation will host approximately 1,300 members of the III Marine Expeditionary Force. An additional 3,700 Marines will be assigned there as a rotational force. Nearly 40 Marines and about 110 civilians were working at Camp Blaz as of December 2022. The Marine Corps noted in its press release that it is “partially funded by a monetary contribution from the Government of Japan.”

Local protesters were present at the activation ceremony. They objected to the name of the installation, the status of Guam as an unincorporated territory of the U.S., the installation's environmental impact, the destruction of local sacred sites, and a concern that the increased military presence will make the island a target for attack.

Analyst Comment

Per a Marine Corps press release, Guam was chosen as a location for a new base in 2012 as part of a broader defense agreement between the U.S. and Japan. That agreement "set the framework for the relocation of Marines from Okinawa to Guam." Approximately 9,000 Marines and their families will eventually be relocated from Okinawa, 5,000 of which will go to MCB Camp Blaz. Guam currently hosts 22,000 U.S. troops at Anderson Air Force Base and Naval Base Guam.

Camp Blaz's activation comes as the Marine Corps shifts its focus to threats from China. Force Design 2030, a restructuring plan for the Marine Corps, places a spotlight on the Indo-Pacific region. A goal of opening the installation is to promote regional security and stability. The mission statement of Camp Blaz is to "Provide the Fleet Marine Forces with operational functionality in order to enhance warfighting capabilities, facilitate the strengthening of coalition partnerships and joint region relationships, while projecting forward presence."

Continued protests directed toward the installation are possible as expansion continues over the coming years. While most protests remain peaceful, the potential exists for violence.

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Hazards

Navy Dry Docks Closed for Earthquake Resiliency Improvements

– Earthquakes

Summary

In February, the Navy started work on two (2) Washington state submarine dry docks that the service shuttered the prior month. An assessment revealed that issues with the docks' structural integrity put them at risk for earthquake damage. In late January, the service closed four (4) dry docks. Three (3) were at Puget Sound Naval Shipyard and Intermediate Maintenance Facility in Bremerton, WA, and the other was the delta pier at the Trident Refit Facility in Bangor, WA.

On 10 February, the Navy issued a \$76.35 million task order to Kiewit-Alberici SIOP MACC JV "for the rapid implementation of recommended courses of action based on concurrent existing conditions assessments at three (3) dry docks in Puget Sound Naval Shipyard and Intermediate Maintenance Facility, and Naval Submarine Base Bangor." The maximum amount is capped at \$80 million. The Secretary of the Navy described the project as "getting ahead of the problem."

Analyst Comment

Earthquakes can result in structural failures, triggering a multitude of potential issues. Communications, security systems, power, potable water systems, and transportation of essential goods and personnel may all be hindered or disrupted. In this particular case, there were concerns that the structural failure of the drydocks could cause damage to the submarines maintained there, some of which use nuclear material. The structural failure of these drydocks could lead to loss of life and/or injuries. Currently, 14,000 personnel work at the shipyards.

Both the Puget Sound Naval Shipyard and Intermediate Maintenance Facility and the Trident Refit Facility are located near several fault lines. While these measures are preventative, they are necessary, as the region experiences regular earthquakes. Washington State, itself, experiences near daily earthquakes, though most are small enough not to be felt. The state has the second highest risk of earthquake occurrence in the country, making preventative measures such as the dry dock improvements crucial.

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Flooding and Mudslides in California – Natural Hazards (Meteorological)

Summary

On 21 March 2023, California experienced scattered flooding and mudslides following heavy rain and snow. About 17 million people reside in the region where the National Weather Service (NWS) issued flood watches, including most of greater Los Angeles and a significant portion of western and central Arizona. Furthermore, open-source reporting indicates that gusty, gale-force conditions were present around Santa Cruz and the Bay Area, with sustained winds of 60 to 70 miles per hour. The winds toppled trees and powerlines. More than 14,000 people across California were instructed to seek higher ground due to flooding. Approximately 47,000 people were under evacuation warnings. Approximately 250,000 homes and businesses were without electricity across California.

The storm also resulted in increased snow in the coastal mountains and the Sierra Nevada range. Forecasts indicated elevations above 6,000 feet received as much as three (3) to four (4) feet of snow. Over 20 people have died from storms in California this winter. The extreme weather also caused widespread property damage and upheaval for thousands of residents. At its time, the mid-March storm marked the twelfth atmospheric river since December to hit the U.S. West Coast. According to open-source research, an atmospheric river holds (as vapor) more than 20 times the amount of water the Mississippi River carries. Furthermore, reports note that California experienced 31 atmospheric storms from October 2022 to March 2023. Of the 31 storms, one (1) was categorized as extreme, and six (6) were strong. Furthermore, almost half of the storms were moderate, and 11 were weak.

Analyst Comment

Floods, mudslides, and heavy snow events in California have the potential to impact DoD assets and installations in the region. For instance, a flood may cause an installation to experience structural damage, vehicular damage, unsafe food, contaminated water, and overall poor sanitation. Damage to critical infrastructure can impede transportation routes for assets and personnel, lead to power and internet outages, delay missions, and limit access to facilities. In addition, heavy snow events can lead to installation damage and temporary closure, limit access to facilities, require installation personnel to shelter in place, and affect power lines and internet connectivity.

Atmospheric rivers cause most of the flood damage in the western U.S., especially in California. While scientists consider weak atmospheric rivers to be beneficial since they produce modest rainfall, stronger atmospheric rivers can be hazardous. In the 2022-2023 winter, Central and Southern California encountered nearly double the average number of moderate and strong atmospheric rivers. Furthermore, some research suggests that atmospheric storms could be getting slightly wetter due to climate change. However, a minor increase could significantly intensify the system's effects.

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Increased Solar Flare Activity – Natural Hazards (Space Weather)

Summary

There have been seven (7) X-Class Solar Flares recorded to date in 2023. In perspective, there were seven (7) such solar flares in all of 2022, two (2) in 2021, and none recorded in 2020. The most recent event was 29 March 2023, causing a strong shortwave radio blackout over southeast Asia, Australia and New Zealand.

X-Class Solar Flares are the strongest class of solar flares and are caused by giant explosions in the sun that send light, energy and high-speed particles into space. These explosions are usually associated with solar magnetic storms known as Coronal Mass Ejections (CME). CME's have an 11-year cycle, with the peak of the current cycle arriving soon. Effects from X-Class Solar Flares include degradation or loss of HF/VHF/UHF radios, disruption or loss of satellite communications, disruption or loss of accuracy in GPS services, and in extreme cases, loss of power.

Astrophysicists at the U.S. Naval Research Laboratory are developing a system to predict how long the effects of a solar flare will last. Current solar flare modeling is slow and often the effects of a solar flare conclude before the model can be completed. Researchers are studying the use of several programs and computer models that allow computers to receive data sets from solar flares. Over time these data sets are analyzed, allowing the computer system to learn and create more accurate and timely models of solar flares. If and when these systems become more effective, the duration and severity of disruption could be more accurately predicted, giving commanders the information needed to make decisions that can mitigate the effects.

Analyst Comment

As the DoD becomes more reliant on technology, understanding the effects of and mitigation tactics for solar flares will become more important. The U.S. Navy and Air Force use HF/VHF/UHF communications frequently for over-the-horizon communications. Solar flares can have effects similar to jamming technology and could be confused as enemy action. Monitoring space weather forecasts and warnings can help leaders adjust the timing of operations to avoid these effects. Sometimes adjusting frequencies can improve the effectiveness of a system or altogether avoid the effects of solar activity. These aspects will be more important during the high point in the CME cycle.

Until predictions on the time, location and severity of solar activity become timely and reliable, training servicemembers to identify the effects of solar activity will be key to help them understand the changes in the operational environment and make critical adjustments to mitigate these effects.

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Diesel Fuel Spill at the Maui Space Surveillance Complex, Hawaii

— Accidental Events (Human or Technologically Caused)

Summary

On 31 January 2023, the Air Force announced that about 700 gallons of diesel fuel spilled at the Maui Space Surveillance Complex in Hawaii. According to the Air Force, a diesel fuel pump for an on-site backup generator failed to shut off on 29 January 2023. Maintenance personnel identified the failure at about 0800 on 30 January 2023 and proceeded to shut off the transfer pump. Maui Space Surveillance Complex, a mountaintop observatory on Maui operated by U.S. Space Forces Indo-Pacific, tracks satellites and space debris utilizing various telescopes atop Haleakalā, a dormant volcano. One (1) of the telescopes includes the DoD's largest optical telescope designed for tracking and imaging satellites, with visible and infrared sensors to collect data on near-Earth and deep-space objects.

Open-source reporting indicates that critics, such as the Sierra Club Hawaii, native Hawaiians, and local politicians are concerned about the military's footprint on Haleakalā and throughout Hawaii. According to local experts, Native Hawaiians use the summit area of Haleakalā as a religious site. In the days following the spill, local protest group Kāko'o Haleakalā demonstrated against the installation and DoD presence in the area.

Additionally, open-source research indicates that there have been protests in Hawaii over another site utilizing telescopes in the state. In 2019, several Native Hawaiians and Hawaiian rights activists camped at the foot of Mauna Kea, a dormant volcano, to block the only road to the mountain's peak on Hawaii's Big Island. The protestors prevented equipment from reaching the summit to begin construction of a \$1.4 billion scientific project, the Thirty Meter Telescope, and caused other scientific facilities to shut down. Since the summit is considered a sacred site in traditional Hawaiian culture, protestors expressed that they believed the state's economic interests had received priority over Native Hawaiian cultural and land use rights. At least 33 people were arrested in the protests.

Analyst Comment

HAZMAT releases on DoD sites can impact not only assets and personnel, but they can also result in community grievances. Following the diesel fuel spill at the Maui Space Surveillance Complex, the Secretary of the Air Force stated that the spill "calls into question the trust placed in us by local communities." There have been other HAZMAT spills on military sites in Hawaii, as the contamination of local tap water in 2021 sickened about 6,000 people who were mostly living in military housing at or near Joint Base Pearl Harbor-Hickam. At least 93,000 people living in military housing on and around Pearl Harbor were impacted by the 20,000-gallon jet fuel spill at the Navy's Red Hill Fuel Storage Facility. About 5,000 gallons of jet fuel seeped into the ground and tap water. Some activists, Native Hawaiians, and citizens protested in front of the headquarters of the U.S. Pacific Fleet following spill.

Investigations following HAZMAT spills can also delay or alter an installation's mission and personnel schedules. According to the commander of the U.S. Space Forces Indo-Pacific, teams were sent to conduct inspections of generators at military installations across Hawaii. Open-source research notes that the Space Force has six (6) generators at bases and installations throughout the state. According to the Space Force, as of 22 March 2023, Phase One of the excavation at the Maui Space Surveillance Complex was completed. About 84,000 pounds of soil were removed from the site, and the soil removed is being stored at the top of Haleakalā until a remediation plan is authorized in Phase Three. Due to slope and safety limitations, excavation averaged to about three (3) feet depth of previously disturbed soil. The Space Force notes that the scope of contamination will be determined in Phase Two by taking core samples at a depth of 40, 80, and 200 feet.

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Radioactive Capsule Lost and Recovered in Australia – Accidental Events (Human or Technologically Caused)

Summary

On 01 February 2023, Australian authorities found a radioactive capsule that was lost in the Outback after nearly a week-long search along a 1,400 km (870-mile) stretch of highway. Per the Emergency Services Minister, the military was verifying the capsule and it would be taken to a secure facility in the city of Perth. The radioactive capsule was part of a gauge used to measure the density of iron ore feed from Rio Tinto's Gudai-Darri mine in the state's remote Kimberley region. The ore was being taken to a facility in the suburbs of Perth. While the capsule was in transit, it fell off a truck. The capsule was eight (8) millimeters long and six (6) millimeters wide, making it even more difficult to locate.

Analyst Comment

The temporary loss of this radioactive capsule resulted in a unique HAZMAT situation. Due to the length of the journey (1,400 kilometers or 870 miles), the time and location in which the capsule fell off the truck was unclear. This necessitated a team of six (6) vehicles spending five (5) days searching 3,000 kilometers (1,864 miles). Radiation equipment was used to check for radioactive material. The capsule appears to have fallen off the truck approximately 120 kilometers into its initial journey. While the truck carrying the capsule arrived at its destination on 16 January, the capsule's loss was not discovered until 25 January.

The silver capsule contained Caesium-137, which emits radiation equal to 10 x-rays per hour. While the search for the capsule was underway, civilians were instructed to stay at least five (5) meters (16.5 feet) away from the capsule if they spotted it. Caesium-137 has a half-life of about 30 years. If the capsule had not been located, it could have posed a risk for radiation burns or sickness to area residents and passersby for decades.

While the transportation of radioactive material is common, the loss of the material is unusual. It has not yet been reported how the capsule escaped the layers of radiation-proof packaging on the truck. When it fell off the truck two (2) hours into its journey, the capsule manager to cross a lane of highway traffic and land two (2) meters (6.5 feet) from the side of the highway.

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F-35 Joint Strike Fighter Engine Problem Reportedly Solved –

Accidental Events (Human or Technologically Caused)

Summary

Delivery of the F-35 Lightning II aircraft resumed on 14 March 2023 after a three-month delay, which was caused by a December 2022 mishap involving an F-35B at the Lockheed Martin assembly plant located at Naval Air Station Joint Reserve Base Ft. Worth. The F-35B is a Marine Corps aircraft capable of Short Takeoff Vertical Landing (STOVL). Video shows the F-35B hovering during a pre-acceptance flight. It bounced on the runway and spun on the ground before the pilot safely ejected.

The Joint Program Office (JPO) and the engine's manufacturer, Pratt and Whitney, determined the cause of the mishap to be "harmonic resonance." In layman's terms, vibration caused a fuel tube to fracture. A group of aircraft was identified to be of higher risk. Those models were grounded. This included some F-35s that were delivered to partner nations.

On 02 March, the JPO issued a time compliance technical directive (TCTD), which ordered the entire fleet of F-35s service-wide to complete a one-time fix for the issue. It involves a retrofit that requires between four (4) and eight (8) hours at the operational level. The fix is inexpensive, non-intrusive, and will maintain commonality of components across all models of the F-35. This retrofit will allow all grounded F-35s to fly.

Analyst Comment

Harmonic resonance is not a new issue to the F-35 and its F135 engines. In March 2020, an engine failed a predelivery test due to a vibration problem. After a four-month investigation, "additional pre-acceptance procedures" were put in place to detect and rectify any issues prior to the delivery of the engine. This new issue is said to be a different than the original vibration problems. The fix is being applied to all F-35 variants out of an abundance of caution and because the fix is reportedly both simple and cost-effective.

Complex weapon systems commonly have issues during the first years of use, and the F-35 is no different. It is critical that DoD personnel receiving these aircraft as well as the myriad of contractors involved identify and correct any issues safely and efficiently. Fast and effective resolution to these early issues helps maintain the confidence of aviators and partner nations. It also conveys to competing nations that American F-35s are prepared for combat operations should the need arise.

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On the Radar

- **North Korean Weapons Tests.** *The U.S. and South Korea recently completed the largest joint exercises in the last five (5) years. These exercises included all branches of the military and displayed joint interoperability across multiple domains of warfare. North Korea responded by testing ballistic missiles and a nuclear capable underwater drone. Joint U.S.–South Korean exercises followed by North Korean weapons testing has become a common cycle but may have greater significance against the backdrop of worldwide economic issues, tensions with China, and war in Ukraine.*
- **Supply Chain Challenges.** *Open-source reports indicate that the U.S. cannot quickly produce and ship weapons systems such as artillery and radar. According to expert logisticians, COVID-19's impact on manufacturing and supply chains highlighted an existing problem. At the same time, the war in Ukraine also magnified the capacity problem in sustaining combat operations at sea, on land, and in the air. Ultimately, the DoD faces a logistics conflict between efficiency and resiliency.*
- **El Niño.** *With increasing summer temperatures and the development of El Niño conditions, watch for impacts to the drought and wildfire cycles across the globe. Some experts speaking in open source media believe that 2024 may be the hottest year since 2016, which was the hottest on record.*