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International experience. Local knowledge.

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Overview

This report is a short extract of Le Beck's special reports on aviation security in the Middle East. This extract focuses on anti-aircraft weapons in the hands of some of the various militias operating in the region.

The main threat stems from the relatively wide circulation of man-portable air-defense systems (MANPADS), thus limiting most of the threat to the take-off and landing phases and underscoring the importance of securing a large perimeter around regional airports. Militias and terror groups across the region have used such weapons with different levels of efficiency. What's clear, however, is that all of them have gained significant experience in the use of such weapons, and that despite efforts to control their circulation, the conflicts in Syria, Iraq and Libya have made it possible for anti-aircraft weapons to be used by local groups even outside of these conflict areas.

Other groups, particularly the Houthis, have also displayed more advanced capabilities, through the use of outdated yet still efficient anti-aircraft weapons. Our broader Specialized Security Report (SSR), of which this report is an extract, discusses these threats, the motivation behind potential attacks against civilian airliners, potential warning signs and trigger events, along with over trends that relate to aviation and airport Security.

Islamic State

Syria & Iraq

Overview

Despite its de facto military defeat in Iraq and Syria, Islamic State (IS) still operates in Iraq and holds some territory in Syria. The group has proven capable of using relatively advanced weaponry looted from both the Iraqi and Syrian army to attack and down military aircraft at low altitude.

Type of weapons used and previous incidents

IS elements within both Syria and Iraq have used anti-aircraft weaponry on several occasions to successfully down aircraft used by either the Iraqi air force, the Syrian Arab Air Force (SAAF), and the Russian air force. The group has created several “anti-aircraft units” that primarily use ground cannons against warplanes carrying out airstrikes against cities the group controlled.

The group has exclusively used MANPADS and anti-aircraft cannons to target low-altitude aircraft, particularly combat helicopters and older Soviet jets used by the Syrian army. This includes, among others, the downing of an Iraqi combat helicopter in Mosul in May 2017 using what appears to be a 9K38 Igla missile. In July 2016, the group also used an unidentified MANPADS to shoot down a Russian combat helicopter near the city of Palmyra. IS is likely to have more advanced versions of the same weapons, as these were also used by the Iraqi and Syrian military. In 2014, the group also released a series of related photos, including one showing that the group had likely looted a Chinese-made FN-6 anti-aircraft missile. Other more advanced systems have never been used despite the fact that anti-aircraft batteries likely have fallen in the hands of the group.



Figure 1: An IS militant using a MANPADS near Mosul

Conclusion

IS has developed significant anti-aircraft capabilities over the past three years using mostly MANPADS to target low-altitude warplanes. Several of its fighters likely have gained significant experience in using these missiles. IS has, however, seen its capabilities largely undermined by a broad push against the group in 2017, with no successful attack reported since May 2017.

Still, while the group is clearly in decline, IS militants may still be able to carry out such attacks and the potential experience gained by its members in the use of anti-aircraft missile would be particularly concerning if militants are able to leave the Iraq-Syria theatre. The use of MANPADS, however, limits IS’s ability to target airliners to the landing and taking-off phases, underscoring the importance of creating a strong defense perimeter around airports.

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| Date | Location | Incident |
|-------------------|--|---|
| 17 May 2017 | Mosul, Iraq | IS shoots down an Iraqi combat helicopter near Mosul using what appears to be an Igla anti-aircraft missile |
| 6 April 2017 | Mosul, Iraq | IS shoots down an Iraqi combat helicopter in Mosul, killing two of its crew, using anti-aircraft cannon. |
| 3 November 2016 | Huwaysis, near Palmyra, Syria | IS claims they downed a Russian helicopter near Palmyra using a “guided missile”. |
| 20 October 2016 | Markadah, Eastern Syria | IS claims to have shot down a US A-10 warplane. The US-led coalition denies. |
| 21 September 2016 | Eastern Qalamoun region near Damascus, Syria | IS claims they shot down a Syrian fighter jet near Damascus, without mentioning the weapon used. The Syrian regime confirms the loss of the plane without mentioning the circumstances. |
| 18 September 2016 | Deir ez-Zor, Syria | IS claims they shot down a Syrian fighter jet in Deir ez-Zor. There is no information as to the weapon used. |
| 8 July 2016 | Palmyra, Syria | IS shoots down a Russian combat helicopter using a MANPADS near Palmyra. Russia’s Ministry of Defence confirms the loss of a combat helicopter. |
| 17 February 2016 | Fallujah, Iraq | A Bell IA-407 support helicopter is shot down by IS near Fallujah, killing two pilots. The Iraqi military indicates the aircraft was downed by anti-aircraft cannon fire. |
| 24 May 2015 | Kweres, eastern Aleppo, Syria | IS claims they shot down a Syrian helicopter near Kweres, with reports suggesting they used an anti-aircraft missile. The Syrian military claims the incident was due to a “technical fault”. |

Egypt

Overview

Islamic State's (IS) Wilayat Sinai or Sinai Province has also used MANPADS to target Egyptian aircraft over the past year. Most significantly, the group is the only IS affiliate to have successfully targeted a civilian airliner. In 2015, the group used an explosive device hidden inside a Russian airliner that took off from Sharm el-Sheikh to down the aircraft and kill 200 passengers.

Types of weapons and previous incidents

With the notable exception of the abovementioned 2015 downing of the Metrojet airliner in Sinai (which relates more to airport security than anti-aircraft weaponry), IS operatives in Sinai have used mostly MANPADS and anti-aircraft guns to target Egyptian jets. The group has boasted of its capabilities on multiple occasions, including via the release of pictures purportedly showing its members learning to use an Igla missile. In terms of operational history, while they have used guided missiles (particularly the Russian Kornet anti-tank missile) on multiple occasions, anti-aircraft weaponry in Sinai has been largely limited to a single incident: in July 2015, the group released a series of photos showing the purported downing of an Egyptian Apache in an undisclosed area of the Sinai Peninsula. Again, the photos suggest that an Igla anti-aircraft missile was used.



Figure 2: An IS training course on the use of anti-aircraft missiles



Figure 3: Purported explosive device used to bring down Metrojet 9268

With regard to the crash of the Russian airliner, one of the most significant attacks against a civilian aircraft in recent years, IS released what it claimed were photos of the device used to bring down the jet. At this time, Egypt has yet to publically release the result of its investigation, yet Moscow's decision to suspend flights to Egypt for the past year suggests the possibility of a serious failure on the part of security personnel. Since then, Cairo has engaged in extensive efforts to upgrade airport security through a \$76 million security plan. In this context, it is possible that IS was able to bring the explosive materials on board through airport personnel, as some reports have suggested.

Conclusion

While IS Wilayat Sinai's weapon systems may not significantly differ from other jihadist groups, given that they have mostly used MANPADS and anti-aircraft cannons, the group has demonstrated its ability to use specific and likely in-depth intelligence to maximise the impact of its attacks. This is evidenced by the Metrojet crash, but also on a more regular basis with other attacks that showcase their ability to gather sensitive intelligence on military operations in Sinai. This was, for instance, highlighted by an attack against a helicopter transporting Egypt's Defence and Interior Ministers last year at the al-Arish airport. While the attack occurred after the two officials had disembarked, this demonstrates the group's ability to access highly sensitive information.

Syrian opposition (moderates & jihadists)

Overview

Anti-aircraft weapons have regularly been used by Syrian opposition groups, whether they be moderates or jihadists. As is the case with other local militias, their capabilities are limited to low-altitude weapons, mostly MANPADS and anti-aircraft canons. These weapons may have been acquired both by looting Syrian weapons depot, as well as through direct or indirect supply from countries supporting the opposition. The US and other Western countries have, however, maintained a policy of not supplying such weapons to the opposition (even vetted groups that received other advanced weaponry), while further monitoring any third-party delivery (by other countries cooperating with Washington) when possible.

Types of weapons and previous incidents

The Syrian opposition has been able to shoot down several regime warplanes, as well as one of the older aircraft still in use by the Russian air force (an Su-25) and a Russian transport helicopter (Mi-8). In 2016, in particular, the opposition carried out a string of attacks using MANPADS that led to a shift in Russian tactics, with the replacement of a squadron of Su-25 by combat helicopters equipped with state-of-the-art anti-missile counter-measures. Syrian opposition groups were able to bring down aircraft used by the regime as early as February 2013, when a video surfaced of the shooting down of a Syrian aircraft by opposition fighters using an FN-6 MANPADS in Deir ez-Zor. Other attacks include the shooting down of a MiG-23 over the Eastern Qalamoun, or the shooting down of a MiG-22, south of Aleppo.



Figure 4: A Syrian rebel seen with a Chinese FN-6 MANPADS in the Homs Province in 2016

As for the type of weapon used by these groups, most of the MANPADS that can be identified are either Russian-made Igla types or Chinese-made FN-6 types. Some reports in 2013, had claimed opposition groups received FN-6 MANPADS from Qatar, with some likely ending up in the hands of jihadist groups such as IS (See IS section) after being taken over from other groups. These attacks have been made possible by the fact that Syrian aircraft are relatively outdated and are required to fly at low-altitude to carry out combat missions. While a Russian aircraft was also shot down, most of the Russian air fleet flies at higher altitude, and thus cannot be targeted by the opposition.

Conclusion

While the Syrian opposition has not been provided with weapon systems capable of downing high-altitude aircraft, the mere number of MANPADS in the ends of the various factions opposing Bashar al-Assad represents a threat that may not be limited to Syria. Despite efforts by Western governments to keep a close eye on such weapons, and even implement procedures to de-active them remotely, the very nature of the Syrian conflict make it impossible to track all of these weapons, that can relatively easily cross the border to Lebanon or Turkey for instance. An FN-6 was, for example, found following a raid on an al-Qaeda-tied group in Lebanon in 2016.

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| Date | Location | Incident |
|------------------|-------------------------|---|
| 26 June 2018 | Daraa Province | Pro-opposition sources claim a regime warplane was shot down. It is not clear that the aircraft indeed crashed, with reports suggesting it managed to make an emergency landing. |
| 3 February 2018 | Saraqib, Idlib Province | Hayyat Tahrir al-Sham (HTS) claims responsibility for the downing of a Russian Su-25. Reports suggests an Iglu missile was used. |
| 26 December 2017 | Hama Province | A Syrian jet is shot down by opposition forces in the northern Hama Province. The Pilot was killed according to Syrian state TV. |
| 15 August 2017 | Sweida Province | Osud al-Sharqiyah, a group that received support as part of the defunct CIA train & equip program, claims to have shot down a regime MiG-21 aircraft using anti-aircraft canons. |
| 1 August 2016 | Aleppo Province | A Russian Mi-8 helicopter is shot down by opposition fighters near Aleppo city, killing five people aboard. The weapon used is unknown. |
| 2 July 2016 | Damascus Province | Jaish al-Islam claims to have shot down a regime drone over the Eastern Ghouta region. |
| 1 July 2016 | Eastern Qalamoun | Jaish al-Islam shoots down a MiG-23 over Jayrud. There are no reports as to the weapon used. Pro-regime sources claim the crash was due to a "technical fault" |
| 4 May 2016 | Aleppo Province | The Syrian State TV confirms that a MiG-22 was shot down by a surface-to-air missile over al-Eis, south of Aleppo city. The pilot is captured by militants belonging to the al-Qaeda-tied al-Nusra group. |
| 18 August 2013 | Latakia Province | A Syrian MiG-21 Fighter is downed in the Latakia countryside. Videos suggest an FN-6 missile was used. |

Libyan militias

Overview

Following the fall of Gadhafi, Libya's weapons depot were often looted by fighters and others who sought to sell these weapons. As such, Libyan weapons have fueled the black market across the region, including anti-aircraft weapons – most of them MANPADS. Libyan weapons have thus been transferred to various conflict zones in the region, including Syria, with a cargo from Libya and en route to Syria intercepted in Lebanon as early as 2012, and Mali, amongst others. This is despite an effort to monitor these weapons, by various western governments. Libyan militias have also used these weapons during the course of the ongoing civil war.

Types of weapons and previous incidents

Libyan militias, including government backed entities and jihadists have all possess shoulder-fired anti-aircraft weapons. This includes the Tripoli-backed Libya dawn, the Libyan National Army (LNA) affiliated with Major General Khalifa Haftar, and multiple jihadist formations, such as IS's local affiliate, and some al-Qaeda-tied movements such as Ansar al-Sharia and the Mujahideen Shura Council of Derna (MSCD). Both IS and Ansar al-Sharia have released pictures of MANPADS they likely either looted from Gadhafi's weapons depot or acquired through the black market. With regards to the confirmed use of such weapons, the LNA used an Iгла anti-aircraft missile to shoot down a MiG-23 in 2015, while the Brigade for the Defense of Benghazi (BDB – a coalition of Islamist militias that is assessed to include some radical elements) also shot down an LNA transport helicopter in 2016, killing three French soldiers who were aboard.



Figure 5: Two Ansar al-Sharia militants posing with Russian-made MANPADS in Benghazi in 2014

Conclusion

As is the case with other militias, the threat represented by the proliferation of MANPADS in and from Libya is limited to the low-altitude phases of a flight. The threat further differ depending on the various factions operating in Libya. Several jihadist groups, including IS and Ansar al-Sharia, are likely to be motivated to target civilian airliners provided they have an opportunity to do so and feel this is in their interests. Additionally, and specifically in Tripoli, control over civilian air traffic is a source of revenue for several key militias, and some actors may feel it is in their interest to reroute air traffic to the facility they control. During the capture of the Tripoli International airport, for instance, a local militia who controlled another airport inside the city, did not hesitate to burn the facility to the ground, so as to make sure all air traffic goes through the airport it controlled at the time.

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| Date | Location | Incident |
|-----------------|-----------------|---|
| 29 July 2017 | Derna | The Mujahideen Shura Council of Derna (al-Qaeda-tied) claims to have shot down a MiG-23 fighter jet south of Derna. The Libyan National Army (LNA) confirms the crash. The weapon used is unknown. |
| 10 August 2016 | Sirte | The Islamic State claims to have shot down a warplane belonging to Libya Dawn over Sirte. |
| 20 July 2016 | Benghazi | The Brigade for the Defense of Benghazi shoots down a helicopter belonging to the LNA. Three French soldiers are killed in the crash. A surface-to-air missile along with anti-aircraft canons were used. |
| 8 February 2016 | Derna | Ansar al-Sharia (al-Qaeda-tied) shoots down a MiG-23 belonging to the LNA. The LNA claims the crash was caused by a technical failure. |
| 23 March 2015 | Zintan | The LNA shoots down a Libya Dawn MiG-23 fighter jet that was on a bombing mission near Zintan using an Igla anti-aircraft missile. |

PKK

Overview

Anti-aircraft weapons have rarely been used by the PKK, with the last reported incident occurring in 2016. The rare instances in which such weapons were employed have been limited to MANPADS targeting Turkish military helicopters in southeastern Turkey and Iraqi Kurdistan. While the source of such weapons remains unclear, the weapons used may have been acquired via Syrian or Iraqi affiliates.

Type of weapons used and previous incidents

PKK forces claimed responsibility for downing a Turkish AH-1 Cobra attack helicopter in the southeastern Cukurca district, near the Iraqi border, using a MANPADS in May 2016. The group released a video of the attack. The anti-aircraft weapon used appears to have been Russian-made Igla. It is worthwhile noting, however, that Turkey claimed that the crash was due to a technical failure.

The May 2016 is believed to be the first successful use of advanced, third generation MANPADS by the PKK, although it has used less advanced anti-aircraft weapons in two previous incidents: two using SA-7 (first generation) in 1997 both targeting Turkish helicopters in Iraqi Kurdistan.



Figure 6: Snip from a video showing the downing of a Turkish Cobra helicopter by a PKK militant

The PKK's contemporary weapons source remains unclear, although it is worthwhile noting that several arms caches, including SA-18, belonging to the Assad regime have been overrun. Furthermore, Turkish reports suggest that the US and/or Russia equipped the PKK-linked groups in Syria with such weapons. As such, the PKK may have acquired MANPADS through Syrian affiliates such as the People's Protection Units. The YPG may, itself have used such weapons in at least one instance to shoot a Turkish helicopter in the northwestern Syrian region of Afrin, during a Turkish offensive this year.

Conclusion

While the PKK has used employed anti-aircraft weapons, namely MANPADS in the past (albeit rarely), the extent of its current operational cache remains unclear, particularly given the last reported use occurred over two years ago. Furthermore, the few instances in which MANPADS have been used, the PKK has solely targeted Turkish military assets in southeastern Turkey and Iraqi Kurdistan.

Houthis

Overview

As opposed to other militias, the Houthis have been able to use anti-aircraft weapons to target aircraft flying not only at low but also at medium and possibly high-altitude. The scope of the threat represented by the Houthis stems in part from its access to Yemeni military weaponry and from material support provided by Iran.

Types of weapons and previous incidents

Yemen's anti-aircraft arsenal can largely be traced back to the Cold War era and support provided by the Soviet Union. Houthi control over the capital (Sanaa) and military alliance with former and now-deceased President Ali Abdullah Saleh meant that a substantial amount of Yemeni military hardware came under Houthi control.

Examples include the SA-2 surface-to-air missiles (SAM), some of which were actually repurposed as surface-to-surface missiles fired at Saudi territory and called the Qaher-1 and Qaher-2. While largely outdated, the SA-2 can be used to target high-altitude flights. This ability to alter arms to suit their purposes is also exemplified by the March 2018 targeting of a Saudi F-15, which the Houthis claimed involved the Soviet R27T air-to-air missile, repurposed as a surface-to-air missile and mounted on a truck. Riyadh, for its part, states that its jet was unsuccessfully targeted in that incident. In January 2018, the group also announced that it had used a new and "locally developed" surface-to-air missile system to down a Saudi Tornado over Saada and an F-15 over Sanaa. In that instance, the Coalition announced that one fighter jet had crashed due to technical failure and that both pilots were killed. The know-how for locally developed air defence and ballistic missiles almost certainly comes from Iran. This is also highlighted by reports suggesting Iran is transferring their Sayyad missile, an Iranian-made surface-to-air missile based on an older anti-aircraft system used by the US navy (the RIM-66 Standard Missile 1), to the Houthis.



Figure 7: A Houthi "Qaher-2" missile/ repurposed SA-2 SAM

Conflicting accounts are commonplace in the Yemeni theatre, with the Houthis frequently describing the successful downing of planes and the launch of ballistic missiles that hit their targets, while the Coalition often describes the former as crashes due to malfunctions (or denies them altogether) and the latter as interceptions. What is clear, however, is that the Houthis do have the ability to target and bring down aircraft at low, medium and possibly high altitude. This is known from the limited incidents where Houthi claims are confirmed, such as the abovementioned incident in March 2018, the downing of a US MQ-9 Reaper Drone in October 2017, and a Moroccan F-16 that was shot down in May 2015. At the same time, the previously referenced conflicting accounts makes it difficult to accurately determine the extent of Houthi capabilities.

Conclusion

At this point, despite Houthi capabilities, their targets have been exclusively military aircraft from countries involved in the conflict or allied with the Coalition. Although it seems unlikely that civilian aircraft would come under such fire, this can also not be ruled out, as commercial, non-military vessels affiliated to Coalition countries have come under attack in the Red Sea. A shift would largely depend on the overall regional picture, and the level of tensions between Riyadh and Tehran.

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| Date | Location | Incident |
|-------------------|--|---|
| 21 March 2018 | Saada Province | Coalition confirms that an F-15 was unsuccessfully targeted with a SAM fired from the Saada airport. Houthis claimed that they struck and damaged the jet with an R27T air-to-air missile mounted on a truck. |
| 7-8 January 2018 | Sanaa & Saada Provinces | The Coalition announces that an unspecified fighter jet crashed due to a technical failure and that the two pilots safely ejected and rescued. Houthis claim that they shot down a Tornado over Saada and an F-15 over Sanaa. |
| 27 October 2017 | Sanaa Province | Houthis claim that a Saudi Typhoon jet was shot down east of Yemen. Other sources deny that this occurred. |
| 2 October 2017 | US describes “western Yemen”; Houthis say Sanaa Province | US MQ-9 Reaper drone is shot down. |
| 18 April 2017 | Marib Province | Saudi Black Hawk helicopter crashes, killing 12 officers. Some sources state that it was shot down by friendly fire. |
| 16 March 2017 | al-Hudaydah Province | Houthis claim they shot down a Saudi Apache helicopter. No confirmation. |
| 15 February 2017 | Marib Province | Houthis claim they shot down a US MQ-9 Reaper drone. No confirmation. |
| 24 February 2017 | Najran Province (southern Saudi Arabia) | Jordanian F-16 crashes due to technical reasons. The pilot survives. Houthis claim that they shot down the jet. |
| 25 January 2017 | Taiz Province | Houthis claim they shot down a Saudi Apache helicopter. No confirmation. |
| 14 March 2016 | Aden Province | UAE says a Mirage jet crashed due to a technical malfunction. Other sources allege that AQAP militants shot it down using an SA-7. |
| 21 September 2015 | Marib Province | Saudi Apache helicopter crashes due to technical issue. Houthis claim that they downed it. |
| 21 August 2015 | Jazan Province (southern Saudi Arabia) | Saudi Apache helicopter crashes, killing two pilots. Houthis claim they shot it down but the Coalition denies this. |
| 24 May 2015 | Sanaa Province | Saudi F-16 is shot down by Houthi fighters north of Sanaa. |
| 10 May 2015 | Saada Province | Morocco says than an F-16 fighter jet was shot down by anti-aircraft fire and is now “missing”. Houthis claim to have shot it down and disseminate images showing the crash and deceased pilot. |
| 7 May 2015 | Najran Province (KSA-Yemen border) | Saudi Apache helicopter is forced to make an emergency landing due to a technical issue. Houthis claim they shot it down. |
| 28 March 2015 | Saana Province | Sudan denies Houthi claims that it shot down a plane and captured the Sudanese pilot. |

Annex: Weapons specifications

Igla MANPADS

According to the state-controlled Russian defense company, Rosoboronexport, the Igla-S, which is the latest and improved version of the Igla, has a max operating range of 6,000 meters (20,000 ft) and maximum operating altitude of 3500 m (11,500 ft).

With regards to previous versions, the 9K38 Igla has a maximum range of 5200 m (17,000 ft) and maximum operating altitude of 3500 m (11,500 ft). The older 9K310 Igla-1 has maximum range of 5,000 (16,000 ft) and maximum operating altitude of 2,500 m (8200 ft). Depending on the type of system, it delivers a missile that flies at speeds between 570 to 800 m/s.

FN-6 MANPADS

The Chinese-made FN-6 is a third generation infrared guided MANPADS designed to engage low flying targets. It has a max engagement range of 5,500 meters and maximum operating altitude of 3800 m (12500 ft). It delivers a missile that travels at a speed of 600 m/s.

SA-2/S-75

The outdated but widely exported Soviet-made SA-2 is a surface-to-air missile produced at the end of the 1950s. Depending on the versions, the Sa-2 has a maximum operating range that varies between 30 to 45 km (18.5 to 28 mi) depending on the model (SA-2a, b, c, e and f) and maximum operating altitude of up to 22km (13.5 mi) for the Sa-2a and up to 30km (18.5 mi) for the other variants.

R-27T

The R-27T is a variant of the soviet-made R-27 air-to-air missile. The R-27T was a standard medium-range air-to-air missile for the MiG-29 in the Yemeni air force. While the missile was modified by the Houthis to serve as a surface-to-air missile, as an air-to-air missile the R-27T has a maximum operating range of 70km.

Sayyad (1-3)

The Sayyad surface-to-air missile is believed to be based on the RIM-66 (SM-1) naval surface-to-air missile Iran acquired from the US prior to the revolution. Iran has produced three versions of the missile (Sayyad 1, 2, 3), with Iran sources claiming the missile had a maximum operating range of 120 km (75mi), and maximum operating altitude of 27km (17mi).