

Implications of Houthi Success in Shooting Down MQ-9 Reaper in the Red Sea Crisis

Introduction:

On 27 Apr 2024, Yemen's Houthi rebels claimed to have shot down an MQ-9 Reaper drone near the Saada/Marib province with a Surface-to-Air Missile as part of their operations against the United States (US) and its allies in the ongoing Red Sea crisis. They also released video footage which shows the missile hitting an object in the night, and a close-up shot of the destroyed drone with serial numbers and logos corresponding to the drone manufacturer General Atomics. A US Pentagon official admitted that a US Air Force (USAF) MQ-9 Reaper had crashed in Yemen, shying away from admitting the fact of the drone being shot down.^[1]

Again, on 21 May 2024, the Houthis claimed to have shot down another MQ-9 Reaper in a similar manner over the province of Bayda with the release of footage. The US Central Command acknowledged the downing report.^[2] The success of the Houthis in shooting down US drones raises serious questions about their vulnerabilities in partially contested zones along with their effectiveness in non-state actor strongholds. From being a weapon of choice in the Afghan-Iraq war to becoming vulnerable in the fight against the Houthis, the US's drone warfare strategy needs serious introspection.

Previous Instances of Houthi Success Against US Drones

Since the beginning of Yemen's civil war in 2014, the US has lost at least five military drones as confirmed by the US officials.^[3] Taking into account the reports of drones shot by the Houthis in the ongoing Red Sea crisis, this number rises to nine drones with seven being directly shot down by the rebels in the mid-flight phase. Out of these nine drones, seven are MQ-9 Reaper drones and the rest two are MQ-1 Predator drones. These drones are operated by different US agencies like the USAF, US Intelligence, Central Intelligence Agency (CIA), etc.

It has been observed that while the footage and images of the destroyed drone are released clearly by the Houthi rebels with full confidence, the US officials are very guarded in their reply to these instances of their drones being shot down and often term these instances as 'Drone Crash' with the cause of crash under investigation. Due to the involvement of multiple agencies operating the drones, it has been seen that while one agency like the USAF will reject the report of their drone being shot down, the other agency like the CIA will decline to comment on the same matter.^[4] This difference in the responses by the US agencies regarding the instances of drone crashes is obviously not to invite negative hype about the capabilities of their military products.

Vulnerabilities of MQ-9 Reaper:

The MQ-9 Reapers are manufactured by General Atomics Aeronautical. It can fly at 50,000 feet and has a maximum endurance of 27 hours with a maximum air speed of 27 Knots True Airspeed (KTAS) or 31 miles/hour. It also carries a Lynx multi-mode radar. This radar is used for surveillance, tracking and targeting operations.^[5] The US Office of the Director, Operational Test and Evaluation (DOTE) in its 2018 report has flagged various defects in the capabilities of MQ-9 Reapers in its annual assessment. It reported that the MQ-9 system was not operationally capable of conducting wide area searches to hunt fixed or moving targets with the Lynx

Synthetic Aperture Radar (SAR). Also, during the assessment in 2017, it was mentioned that the system had some radar deficiencies which were yet to be resolved. The 2018 assessment states that the Lynx radar is difficult to configure and remains unreliable. Additionally, the unencrypted and encrypted data transmitted in some frequencies were poor and radio communication was found not to be working properly. The transmission of metadata from Vortex to Rover was found to be unreliable.^[6]

Now it is a topic of investigation whether all these deficiencies flagged by the US Office of DOTE were resolved by the manufacturers of the MQ-9 Reaper. All of these deficiencies are somehow interlinked to each other and make a drone vulnerable to getting shot down. For example, if the Lynx SAR is not able to search for fixed or moving Air-Defence (AD) assets of the adversaries, then it may unknowingly venture into the operational range of such systems and get shot down. Secondly, if the SAR is itself not functioning well, then there will be huge difficulty in conducting any Intelligence, Surveillance and Reconnaissance operations in cloudy or rainy environments which in turn will give the AD systems to lock and engage via long-range radars. As far as communication of data is concerned, if the correct video feed is not being sent to the ground control stations of these drones, then there is a high chance that the drone operator/pilot is not able to see the AD or man-portable missiles which can be used against the drone. Also, lack of clarity in video feed communication is likely to encourage the drone operator to fly at a lower level in a non-state contested zone, ignoring the fact that nowadays even non-state actors can possess AD and anti-drone systems. While it is not reported how many MQ-9 Reapers suffer from these above-mentioned deficiencies, these deficiencies are definitely related to the protection of any Unmanned Combat Aerial Vehicle in current contemporary contested zones.

Strategic Implications in Future

The implications of these instances of Houthis shooting down US drones are significant and can become strategic in future. Firstly, this marks the beginning of a period where the terrorist and non-state groups can take confidence in shooting down these drones and reverses the advantages which these drones enjoyed in the Afghanistan and Iraq wars. The terrorist groups can now also be widely supported by state actors by means of AD systems which can be effective in bringing down these drones. It is being suggested by Western analysts that the Houthis may have used the obsolete soviet era systems like the S-75 or the Chinese missiles which were acquired by the Yemeni army prior to the civil war. Iranian missiles are also suspected to have been fired since Iran has supplied the maximum missiles to the Houthis.^[7] Each MQ-9 Reaper unit costs around USD 30 million and the successive shooting down of such drones can send a signal to potential buyers whether to purchase such costly drones which are being shot down by non-state actor's obsolete and legacy weapons. Also, this can negatively reflect their performance capability vis-à-vis modern nation-state AD to be highly doubtful.

Conclusion:

The Houthis are a more sophisticated and modern non-state actor group militarily when compared to the previous US adversaries like the Taliban or Al-Qaeda. The benefits which the MQ-Reaper/Predator enjoyed over the last decades in the Afghanistan or Iraq Wars are a thing of the past and it will now be a challenge to operate these systems against modern-day non-state actors and terrorist groups, like the Houthis. Adding to that the deficiencies of these drones

flagged by US agencies, which are not yet known to have been resolved or not dent the effectiveness of these drones. As India is a potential client and is interested in operating these systems in future, it will be apt to reconsider such plans in light of the above events and devise suitable policies in drone warfare considering its threat environment.

Endnotes:

[1] Jon Gambrell, “Yemen’s Houthi Rebels Claim Downing US Reaper Drone, Release Footage Showing Wreckage of Aircraft”, AP News, April 27, 2024.

<https://apnews.com/article/yemen-houthi-rebels-us-predator-drone-israel-hamas-war-5443065ff28e4a40901ecc30d959a665>

[2] Samy Magdy, “Yemen’s Iran-Backed Houthi Rebels Claim They Shot down Another US Drone”, AP News, May 21, 2024.

<https://apnews.com/article/yemen-houthis-us-drone-war-gaza-7bbbcd1a1484baf581832da6f4d4dd18>

[3] Ibid.

[4] AP, “Third US Reaper Drone Goes down in Yemen, according to Houthi Images”, Voice of America, May 29, 2024.

<https://www.voanews.com/a/third-us-reaper-drone-goes-down-in-yemen-according-to-houthi-images/7634026.html>

[5] “MQ-9A Reaper (Predator B),” n.d, General Atomics Aeronautical Systems Inc.

<https://www.ga-asi.com/remotely-piloted-aircraft/mq-9a>

[6] Robert Behler, “MQ-9 UAS 269”, December 2018, Office of the Director Operational Test And Evaluation.

<https://www.dote.osd.mil/Portals/97/pub/reports/FY2017/af/2017mq9reaperuas.pdf?ver=2019-08-19-113931-413>

[7] Parth Satam, “Fourth U.S. MQ-9 Reaper Lost to Houthi Anti-Aircraft Missile in 6 Months”, The Aviationist, May 18, 2024.

<https://theaviationist.com/2024/05/18/fourth-mq-9-reaper-lost-to-houthi/>

Ajay Kumar Das, Independent Researcher and Analyst of International Affairs and Security Studies.

Article uploaded on 30-07-2024

Disclaimer: The views expressed are those of the author and do not necessarily represent the views of the organisation that he/she belongs to or of the USI of India