

A satellite map of the Persian Gulf region, showing the Arabian Peninsula, the Persian Gulf, and the Strait of Hormuz. The land is depicted in shades of brown and tan, while the water is a deep blue. The Strait of Hormuz is clearly visible as a narrow passage between the Persian Gulf and the Arabian Sea.

Use Case  unseenlabs

How can space-based radio frequency
detection help monitor a conflict?

The Strait of Hormuz Under Pressure

An aerial, monochromatic image of the Strait of Hormuz, showing the narrow waterway between the Persian Gulf and the Arabian Sea. The surrounding land is rugged and mountainous, with some coastal infrastructure visible. The water is dark and deep.

What Unseenlabs reveals About Maritime Activity in the Strait of Hormuz



In the Strait of Hormuz, fewer ships on an AIS¹ map do not necessarily mean fewer ships at sea. Since tensions escalated in late February 2026, attacks on vessels, restrictions on passage, and changing routes have disrupted this vital maritime corridor. Some ships wait offshore, while others transit without broadcasting AIS, leaving gaps in the picture of maritime activity.

Unseenlabs detected a sanctions-listed vessel linked to Russia's shadow fleet during its campaign in the Strait of Hormuz. It is part of a broader question: how does maritime activity change during a conflict, and what can we still see when AIS positions are missing?

With three to four radio frequency (RF) collections per day across the area, Unseenlabs compared activity before and during the deterioration of navigation conditions. This use case examines vessels detected without matching AIS positions and shows how repeated observations can support monitoring near sensitive subsea cable corridors. Together, these findings reveal how space-based RF intelligence helps clarify a changing situation at sea.

To understand what Unseenlabs observed, we first need to understand the waterway. Connecting the Persian Gulf to the Gulf of Oman, the Strait of Hormuz carries roughly a quarter of global seaborne oil trade, alongside LNG and other essential goods. Its geography and strategic importance have shaped shipping routes and regional tensions for decades. In 2026, the escalation changed how vessels moved through the area and made that activity harder to monitor.

¹A cooperative tracking system that broadcasts a vessel's identity, position, course, and speed via radio signals. Mandatory for most commercial ships, AIS improves safety and traffic management but can be turned off, spoofed, or manipulated—making it unreliable as a sole source of maritime awareness.

A strategic passage shaped by decades of tension

The Strait of Hormuz lies between Iran and Oman's Musandam Peninsula. It connects the Persian Gulf to the Gulf of Oman, which opens onto the Arabian Sea and the Indian Ocean. This makes the strait the maritime gateway between Gulf ports and international markets. Since 1968, an International Maritime Organization (IMO²) traffic separation scheme has organized vessels traveling in opposite directions through the passage. Its geography concentrates commercial shipping in waters where changes to navigation routes have immediate operational consequences.

Its economic reach is global. In the first half of 2025, an average of 20.9 million barrels of oil crossed Hormuz each day, equivalent to approximately one quarter of global seaborne oil trade. More than one fifth of global liquefied natural gas trade also passed through, primarily from Qatar. The strait is important to agriculture as well: UN Trade and Development estimates that around one third of seaborne fertilizer trade uses this route³. Saudi Arabia and the United Arab Emirates have pipelines that allow some oil exports to bypass Hormuz, but their capacity is insufficient to replace its normal flows. A disruption can therefore spread through energy markets, freight costs, and food supply chains.

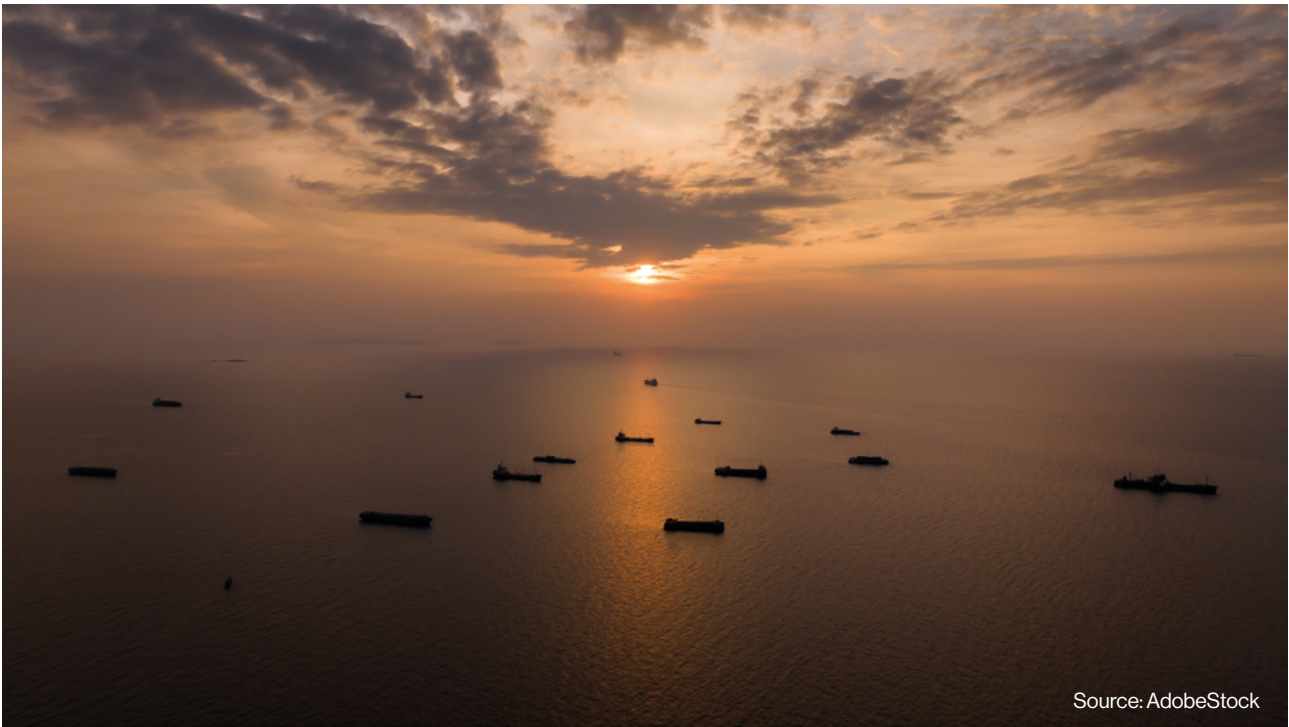
The area has a second role below the surface. Five active submarine telecommunications cable segments cross the strait, connecting Gulf countries to wider communications networks. The International Cable Protection Committee describes Hormuz as an important regional connectivity corridor⁴. These cables add to the infrastructure interests concentrated in and around the passage.

Geography has also made Hormuz a focus of longstanding political and military tensions. Iran and the United Arab Emirates dispute sovereignty over nearby islands, including Abu Musa and the Greater and Lesser Tunbs. During the Iran-Iraq War in the 1980s, attacks on merchant vessels and the use of naval mines threatened shipping across the Gulf in what became known as the "Tanker War." In 2019, attacks on tankers near Hormuz and in the Gulf of Oman raised security concerns again. Iranian forces then seized the British tanker *Stena Impero* while it was transiting the strait. These episodes form part of the history behind present-day decisions about passage, ship security, and insurance.

² The [International Maritime Organization \(IMO\)](#) is the United Nations agency that sets global standards for the safety, security, and environmental performance of international shipping.

³ "Around one third of global seaborne fertilizer trade (about 16 million tonnes) passes through the Strait" UN Trade and Development (UNCTAD), [Strait of Hormuz Disruptions: Implications for Global Trade and Development](#), March 10, 2026

⁴ The [International Cable Protection Committee \(ICPC\)](#) is an international nonprofit organization that brings together cable owners, operators, and governments to promote the protection and resilience of submarine telecommunications and power cables.



The latest crisis began on February 28, 2026, with U.S. and Israeli strikes on Iran followed by Iranian retaliation across the region. Commercial shipping was soon affected by attacks and the threat of further escalation. Shipowners delayed voyages, while vessels remained in the Gulf or waited near its approaches. UN Trade and Development estimated that average daily transits through Hormuz fell from around 130 in February to just 6 in March. By mid-April, the IMO reported that nearly 2,000 vessels and approximately 20,000 seafarers remained trapped in the Persian Gulf⁵.

The situation continued to shift. An April ceasefire brought limited relief, but by late April Kpler estimated transits at only around 10% of their previous level. A U.S.-Iran agreement in mid-June supported a temporary increase in crossings. Renewed attacks in July reversed much of that improvement: in the periods tracked by Kpler, average daily crossings fell from approximately 45 to 13. By late August, the IMO estimated that up to 400 ships still could not leave the Gulf safely.

September showed how much the trade system had changed. Kpler estimated that crude exports from Gulf countries other than Iran had recovered to their earlier volume, but 40% left through routes that bypassed Hormuz. Some tankers crossing the strait traveled with AIS turned off or transferred cargo offshore. Preliminary tracking data counted just two commodity vessels crossing on September 21, a single-day figure that excluded possible crossings without AIS. Regional export volumes and visible vessel counts were therefore describing different parts of the maritime picture.

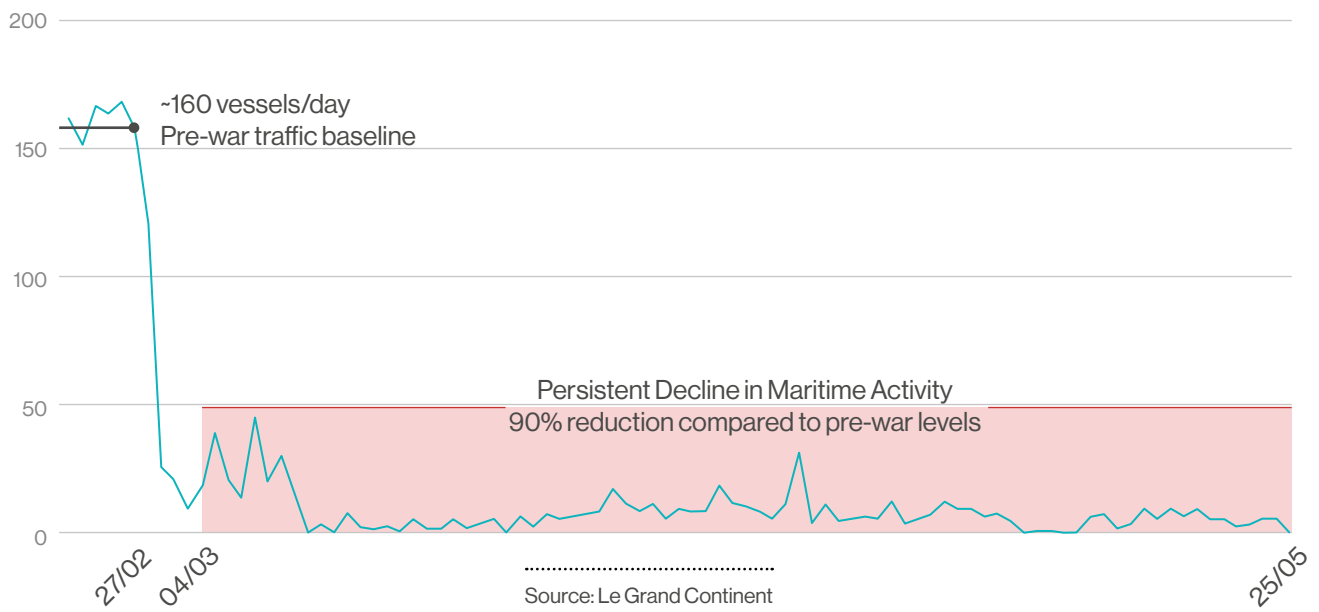
This history and geography explain the stakes of the current crisis. The disruption has changed where ships travel, where they wait, and how reliably their movements can be observed.

⁵ International Maritime Organization (IMO), "[France-UK: Summit on Freedom of Navigation in the Strait of Hormuz](#)", remarks by the IMO Secretary-General, April 17, 2026.s

Rising tensions in Hormuz are degrading maritime monitoring reliability

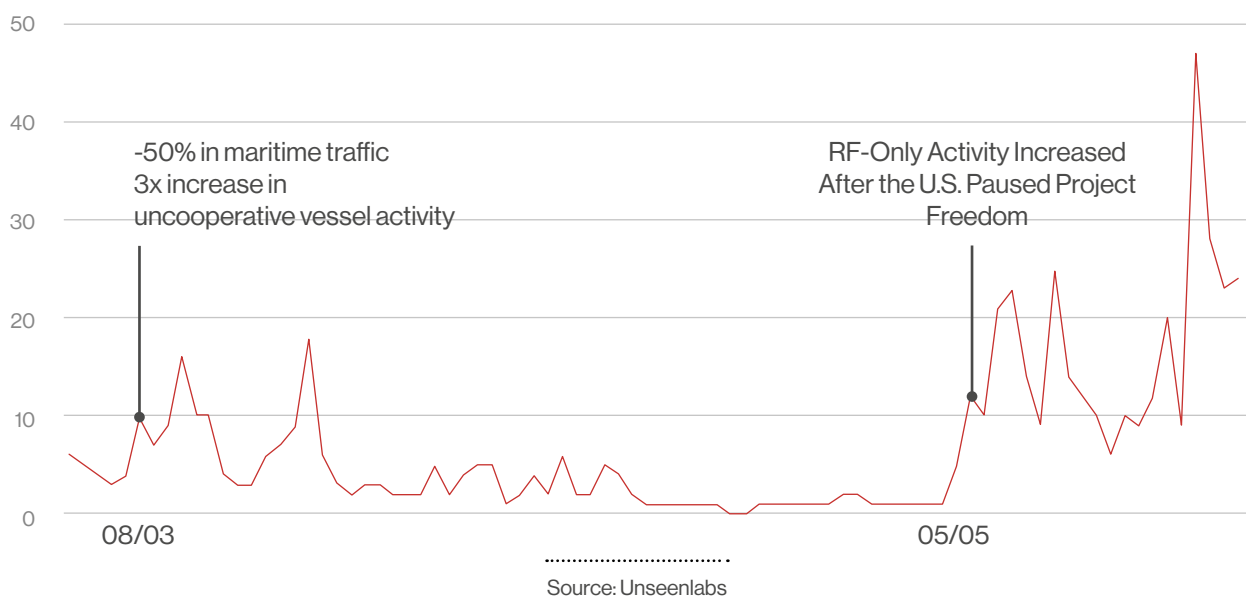
Evolution of Declared Maritime Traffic

From 27/02/2026 to 25/05/2026



Uncooperative Vessels Detected by Unseenlabs

From 03/03/2026 to 25/05/2026



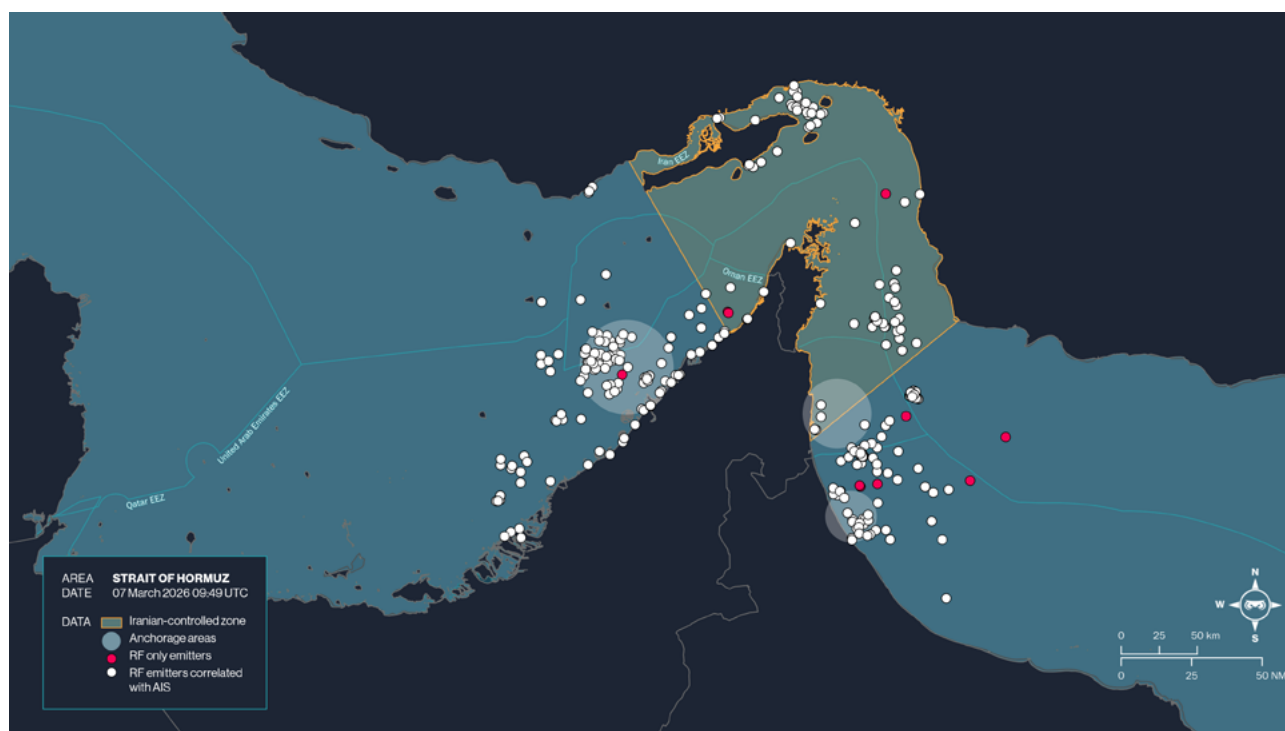
As declared traffic fell, Unseenlabs' RF detections revealed activity that AIS alone could not show.

- **February 27 | Baseline:** Approximately 160 vessels per day appeared in the declared traffic data, immediately before the conflict began on February 28.

- **March 7–8 | Diverging signals:** The campaign figures show a 50% drop in declared maritime traffic alongside a threefold increase in uncooperative vessel activity.
- **May 5 onward | RF-only activity rises:** In the days following the U.S. decision to pause *Project Freedom*, Unseenlabs detected a further increase in activity without matching AIS positions. The timing does not, by itself, establish a cause.

Some vessels continued to operate beyond the view provided by AIS. Space-based RF detection helps reveal that activity, including near sensitive offshore infrastructure.

From usual observations to a surge in RF-only activity

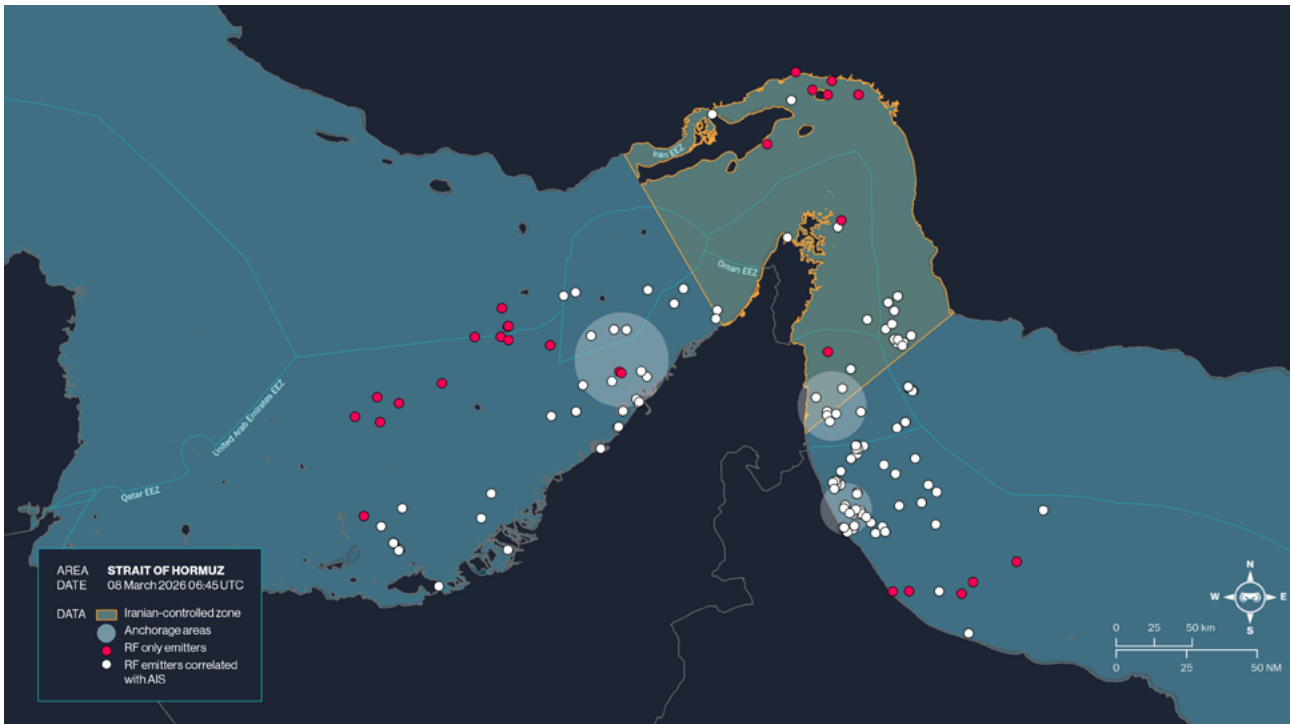


March 7, 2026 | A reference observation

By early March, the conflict had already disrupted passage through the Strait of Hormuz. Yet Unseenlabs' collection at 09:49AM UTC on March 7 still resembled those of the preceding days. It recorded **555 correlations between RF detections and AIS positions**. RF-only activity remained limited, accounting for approximately **1.8% of detections**, with most unmatched emitters located outside the area marked as Iranian controlled. This snapshot provides a reference point for the campaign: most detected activity could still be connected to a declared vessel position.

That picture changed in the collections that followed. On March 7, Iran's Revolutionary Guards [claimed a drone strike on the tanker *Prima*](#). The next phase examines the surge in RF-only activity after the reported strike and what it reveals about the limits of AIS-based monitoring.

To the consequences of Iran's strike



March 8, 2026 | RF-only activity surges

By the following morning, the pattern had changed. At 06:45AM UTC on March 8, Unseenlabs recorded 228 RF–AIS correlations, down from 555 in the March 7 collection. Meanwhile, the number of RF-only emitters had roughly tripled. They now represented approximately 12% of detections, with most located inside the area marked as Iranian controlled.

The two observations show how quickly maritime visibility can change: fewer RF detections matched declared AIS positions, even as more emitters remained detectable through RF alone. That gap becomes especially important when examining a vessel of interest.

The next observation shows how RF data helped confirm the position of a sanctions-listed tanker linked to Russia's shadow fleet.

Confirmation of actual position of tanker listed on Russian dark fleet list

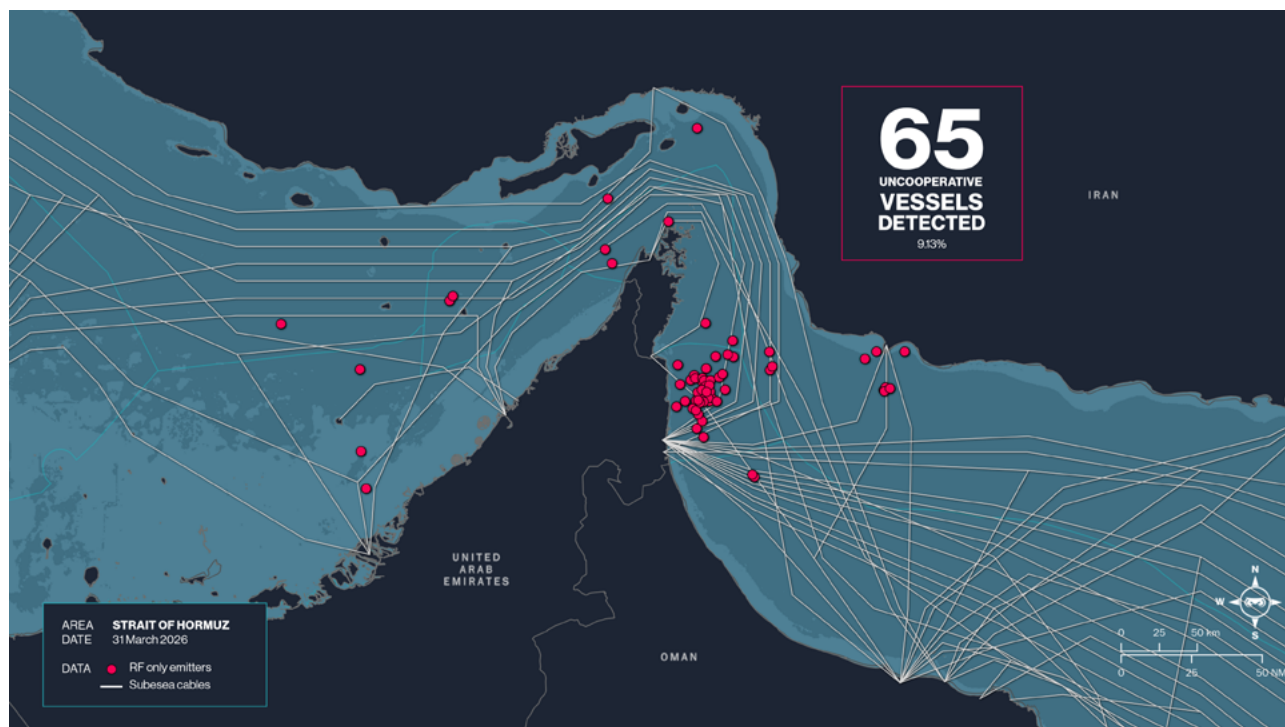


On May 12 and 13, a tanker listed as part of Russia's shadow fleet traveled through the Strait of Hormuz. It had changed names and flags several times over its operating history. Its AIS positions traced a route from waters near Iran, around Oman's Musandam Peninsula, and toward the UAE coast.

Three gaps interrupted that journey. While the tanker was anchored in the EEZ area marked around Abu Musa and the Greater and Lesser Tunbs, its AIS position disappeared for 4 hours and 35 minutes. A second gap lasted more than 13 hours. Later, near an anchorage off the UAE coast, its reported position was unavailable for another eight hours.

During that final gap, Unseenlabs detected an RF emission associated with the tanker near the anchorage, helping confirm its location. The successive observations show both where its AIS track broke and where RF data helped restore visibility.

RF monitoring over critical maritime assets



Beneath the Strait of Hormuz lies a network as important to the region as the shipping routes above it. Five active submarine telecommunications cable segments cross the strait, connecting Gulf countries to wider international networks. During a conflict, knowing which vessels are operating near these corridors becomes an important part of protecting regional connectivity. iscpc.org

On March 31, Unseenlabs detected 65 vessels with RF emissions but no matching AIS positions, representing 9.13% of the activity observed. Many were concentrated off the UAE coast, near mapped cable corridors. RF data established where these vessels were during the collection, even though their positions were absent from AIS.

If a cable incident were reported, these observations could help analysts identify activity requiring closer investigation. Proximity alone does not establish that a vessel interacted with or damaged a cable.

Turning RF Detection into Actionable Intelligence

Independent visibility when AIS is incomplete

Across the Strait of Hormuz, Unseenlabs conducted three to four RF collections per day. These successive observations located RF-emitting vessels, including those with no matching AIS position. As declared traffic fell, they provided another way to see how maritime activity was changing.

From detections to a clearer maritime picture

Comparing RF detections with AIS shows where vessel positions are declared and where activity is visible only through RF. Across multiple collections, analysts can examine changing transit patterns, ships waiting offshore, and activity near subsea cable corridors. These findings help maritime surveillance teams decide which areas and vessels merit closer investigation.

Gen 2 broadens the view

Introduced in July 2026, Gen 2 now extends Unseenlabs' detection capabilities across the L (1–2 GHz), S (2–4 GHz), C (4–8 GHz), and X (8–12 GHz) bands. This broader frequency coverage opens access to more types of emitters, including maritime navigation and surveillance radars, satellite communications equipment, other radar and communications systems, and sources of GNSS interference. [Unseenlabs](#)

For maritime monitoring, these additional signals can help analysts examine activity when AIS positions are missing, assess operations near critical infrastructure, and investigate interference that may affect navigation. Gen 2 also extends RF monitoring to activity on land and in space, while Gen 1 continues to serve maritime missions. The initial Hormuz observations in this case study were collected before Gen 2's first launch.

Conclusion



The Strait of Hormuz campaign shows how a conflict can transform both shipping and the ability to observe it. As security deteriorated, declared transits collapsed and vessels waited offshore. Yet Unseenlabs' repeated RF collections continued to detect activity without matching AIS positions. The rise in RF-only detections in early March and again in May 2026, together with the AIS gaps observed for a tanker linked to Russia's shadow fleet, shows why declared traffic cannot tell the whole story.

By comparing RF detections with AIS across successive collections, Maritime Domain Awareness analysts can locate emitting vessels during AIS gaps, examine changing routes and anchorage areas, and identify activity near subsea cable corridors for closer investigation. These observations establish where and when activity was detected. Further evidence is needed to assess a vessel's intentions or any link to infrastructure damage.

Space-based RF detection helps monitor a conflict by providing independent observations when cooperative reporting becomes incomplete. Gen 2 now extends this approach to a wider range of signals across sea, land, and space. It opens the way to investigate new questions, including navigation interference, and to develop new use cases and markets.

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