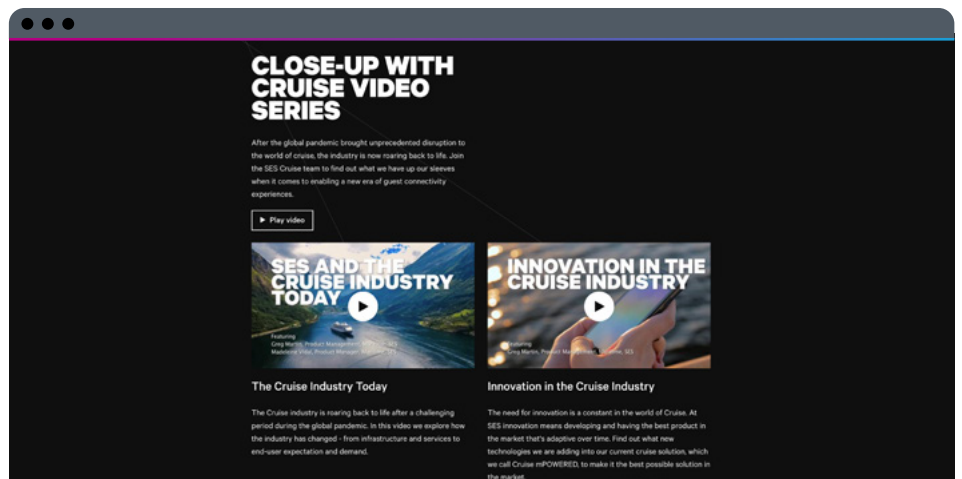# SES △

CLOSE-UP WITH CRUISE

CONTENTS

ABOUT THIS HANDBOOK

This handbook supplements the Close-Up with Cruise video series. In each section, you'll find a brief overview of the topics discussed, descriptions and visual representations of key concepts, and additional information.

WATCH THE VIDEOS

KEY TERMS

GEO
Geostationary Earth Orbit

MEO
Medium Earth Orbit

LEO
Low Earth Orbit

NGSO
Non-geostationary Orbit

Gateway
A ground station that transmits data to and from a satellite

Latency
The delay in data transmission from one communication endpoint to another

5G
Fifth generation technology standard for cellular networks

IoT
Internet of Things

INTRODUCTION

—
CONNECTIVITY FOR CRUISE SHIPS

SES's vast, intelligent satellite and ground infrastructure delivers high-performance video and data solutions to 99% of the world's population. As a pioneer in the satellite industry, we have built our success on delivering next-generation space technology, including the world's first NGSO constellation. Our upcoming O3b mPOWER satellite communications system will bring customers connectivity of unprecedented scale, flexibility, and performance to help them take their success to the next level.

For cruise line operators, reliable broadband connectivity is vital to staying ahead of the competition. Between 2020 and 2030, average bandwidth consumption per vessel is expected to increase from 40Mbps to 340Mbps. This trend is driven by both guests and crews who expect to be able to binge their favourite TV shows, continue working remotely, and share their trip highlights on social media—no matter where the ship travels. At SES, we deliver the only global cruise connectivity solution capable of addressing the cruise industry's rapidly growing demand for better connectivity.

MEET OUR SPEAKERS

GREG MARTIN

As VP Product Management, Maritime, for SES, Greg Martin oversees the development of products and services tailored to customers operating at sea.

MADELEINE VIDAL

In collaboration with product and technical teams, Madeleine Vidal directly supports cruise line customers as Product Manager, Maritime, for SES.

SHIRA LEVINE

As Portfolio & Segment Marketing Lead for SES Cloud Solutions, Shira Levine supports sales activities and communicates SES's cloud offering.

MARK BIEBERICH

Mark Bieberich leads strategies to communicate the core value SES brings to all its customer bases as VP Portfolio & Segment Marketing.

JARROD LAMPHERE

Acting as Senior Manager, Maritime Systems, Jarrod Lamphere oversees the testing of solutions to enhance SES's products and services for cruise customers.
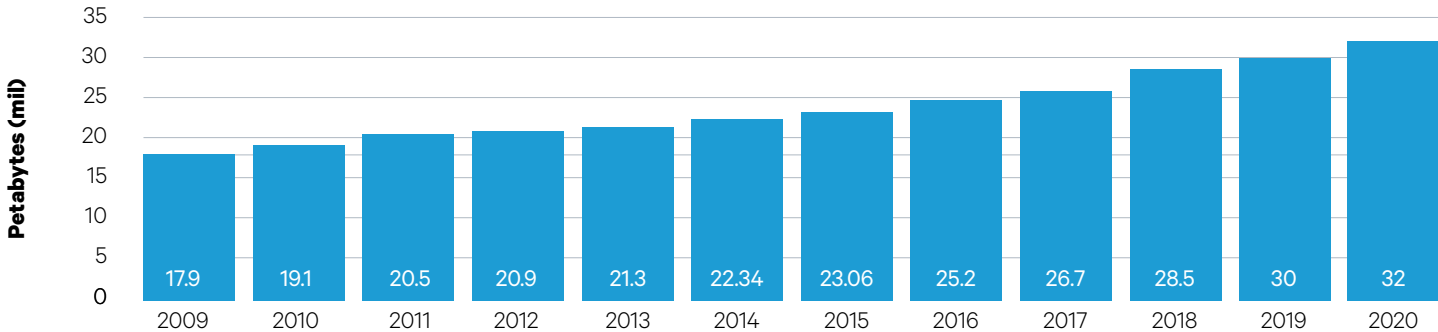
SES AND THE CRUISE INDUSTRY

—

THE CRUISE INDUSTRY AT A GLANCE

Today, approximately 300 cruise ships are in service—many of which operate year-round and offer itineraries from the Caribbean to the Mediterranean, to the Arctic. Compared to a decade ago, cruise lines typically welcome thousands more passengers per voyage. As a result, internet services available on each vessel need to meet the needs of both guests and crew members, who expect the same online experience they have at home—including catching live sports events, making video calls to loved ones, or sharing their reels from the day's adventures.

Expected total number of global cruise passengers

Year	Petabytes (mil)
2009	17.9
2010	19.1
2011	20.5
2012	20.9
2013	21.3
2014	22.34
2015	23.06
2016	25.2
2017	26.7
2018	28.5
2019	30
2020	32

Source: Cruise Lines International Association, 2020

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EVOLVING SERVICES FOR ONBOARD CRUISE CONNECTIVITY

Today, many cruise ships that previously required one or two antennas to meet travellers' connectivity demands now require up to five per vessel. Cruise lines are also quickly realising that GEO satellite technology lacks the performance attributes to manage increasingly bandwidth-intensive applications across crew and passenger laptops, tablets, and smart phones. MEO satellites, which can deliver high-throughput, low-latency connectivity over large geographical areas, are vital to keeping pace with internet service requirements onboard cruise ships—now and in the future.

CHAMPIONING OUR CUSTOMERS' SUCCESS

Each cruise line we work with has a set of connectivity requirements they need to ensure guest and crew satisfaction. Our MEO-based cruise offering—enabled by our proven NGSO satellite constellation—has helped our cruise partners quickly and easily deploy services that meet the changing needs of travellers.

Princess Cruises partnered with us to bring its MedallionNet™ internet service programme up to date, and keep users connected throughout any itinerary.

Mediterranean Shipping Company (MSC) approached SES to launch a new broadband service intended to take their guests' experiences to the next level.

Royal Caribbean is a founding partner for our MEO services in the Caribbean and has since expanded to several locations—where we service more than 10 of its vessels. Read the case study.

O3b mPOWER Satellite Constellation

Gateway

High-Density Maritime Area

Throughput

LARGE

MEDIUM

SMALL
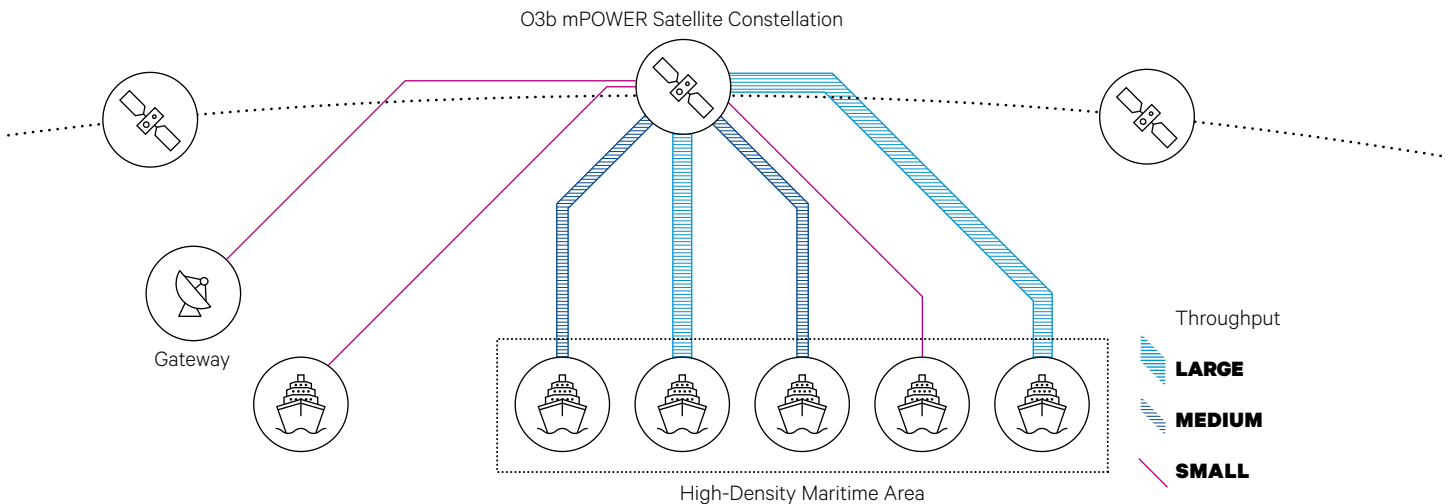
Dynamic beamforming steers capacity to ships

With the launch of our next-generation O3b mPOWER communications system, cruise lines will be able to further elevate guest experiences by providing reliable low-latency connectivity up to the multi-gigabits—no matter where ships travel. Read more about how O3b mPOWER is transforming the cruise industry in chapter 5.

BRINGING MORE VALUE TO OUR CUSTOMERS

During the COVID-19 pandemic, countless cruise passengers and crew members were stranded on ships docked in locations where they wouldn't normally receive coverage. Our team stepped in to provide connectivity to these vessels, so that the people on board were able to communicate with their loved ones while in quarantine.

The pause on cruise ship operations provided the opportunity for our team to improve the overall performance and flexibility of our services. In addition to upgrading equipment on ships, we invested in tools that make it easier for our support teams to remotely access customer systems and perform adjustments or fixes—improving the overall Quality of Service (QoS) our partners receive as the cruise industry gains momentum.

"While the pandemic was devastating, it gave us the opportunity to enhance equipment on ships and help our customers gain a competitive advantage. We upgraded antennas and connectivity systems on vessels—optimising them to provide superior guest experiences as people come back aboard."

—Madeleine Vidal, Product Manager, Maritime for SES

INNOVATION

—
ADOPTING NEXT-GENERATION TECHNOLOGY TODAY

Technologies such as 5G and the Internet of Things (IoT) are bringing greater convenience to our everyday lives. At SES, we proactively look for opportunities to integrate our services with new technologies and help our partners create truly differentiated guest experiences. We work closely with our cruise customers to identify solutions with the potential to solve their ongoing and emerging challenges and advance their position in the market.

At our research and development lab in Port St. Lucie, Florida, our engineering teams integrate and test technology to continuously expand our cruise service offering. Read more about this initiative in chapter 6.
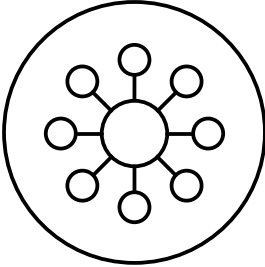
KEY CRUISE INDUSTRY REQUIREMENTS:
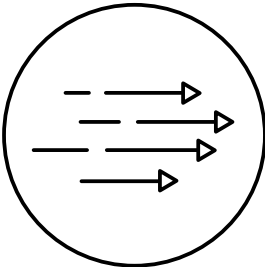
Higher capacity
Customers have recently requested capacity increases of more than 50% per ship
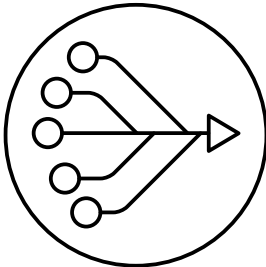
Greater simplicity
Solutions need to enable equipment on different parts of the ship to interoperate, and link to shoreside networks that support travellers' needs

Guaranteed consistency
Every ship in the fleet needs to offer the same level of performance from the moment it leaves the dock—24/7/365

"SES works directly with cruise lines to continuously gather feedback on our service. Our operations group maintains continuous contact with the vessels and management teams to address any service issues immediately. We're not just talking about issues that arise today, but the challenges that our customers will face in six to 18 months. It's important that we get in front of future roadblocks by investing time in them now."

— Greg Martin, VP Product Management, Maritime, SES

THE FUTURE OF CRUISE

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THE POWER OF OUR MULTI-ORBIT FLEET

Our cruise service offering combines our MEO and GEO fleets to enable greater availability, flexible traffic prioritisation capabilities, and guaranteed service resiliency in the event of a primary connection outage.

Since our GEO fleet can reach cruise ships outside of MEO coverage area, we're able to support a larger number of itineraries, including months-long transoceanic voyages to remote regions.

In combination with SES's GEO fleet, the Cruise mPOWERED service ensures seamless broadband globally and brings you the right combination of satellite and networking technologies for your business to sail smoothly.

SES Global Coverage Map

GEO Coverage

O3b MEO & O3b mPOWER Range +/- 50°
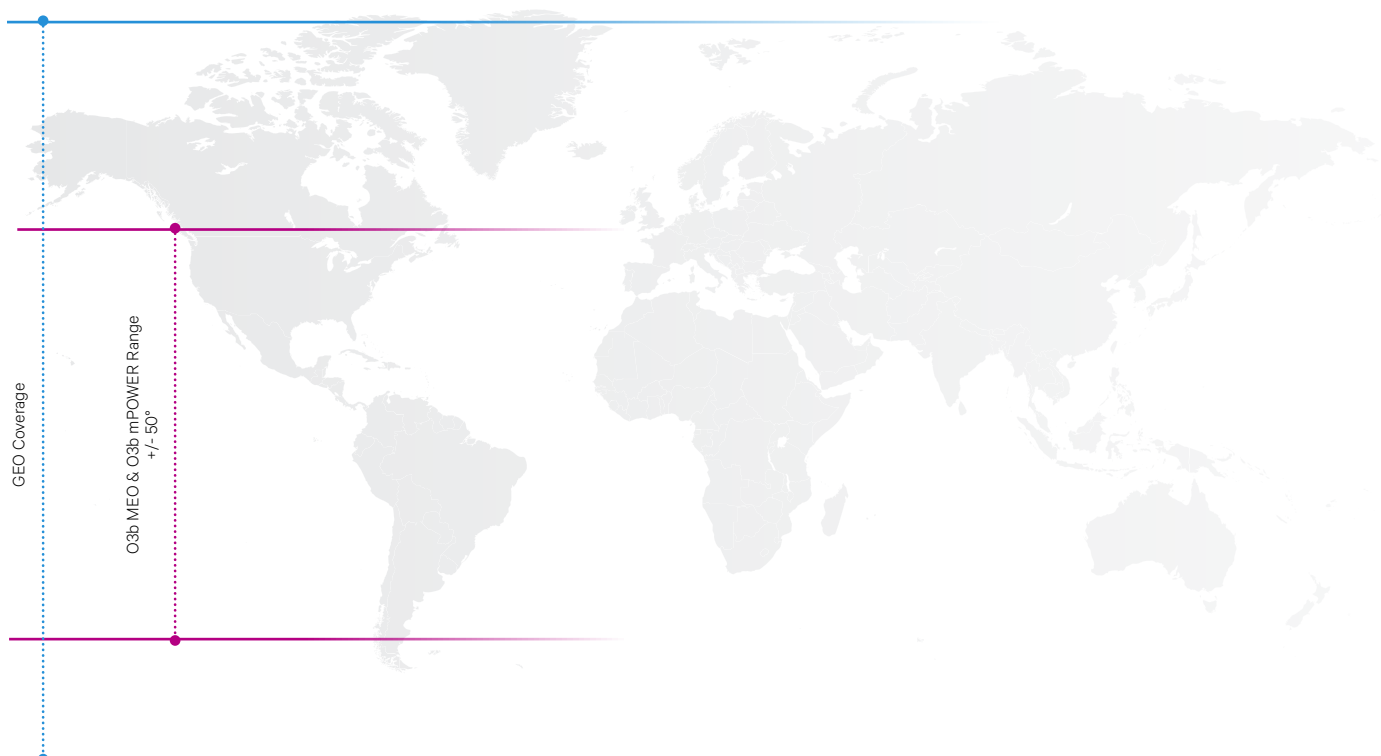
CRUISE mPOWERED

With the upcoming launch of O3b mPOWER—our next-generation MEO satellite communications system— our Cruise mPOWERED service sets an entirely new standard for cruise ship connectivity. The system, which offers ultra-high throughput, low latency, and scalability up to multi-gigabits per second, allows cruise lines to deliver premium internet services to ships of any size. With the flexibility to land traffic anywhere and prioritise it at the application level, O3b mPOWER delivers right-sized connectivity to keep travellers connected and enable cruise lines to leverage smart technology that boosts operational efficiency and improves guest experiences.

**Low-latency and gigabit-scale throughput each trip**
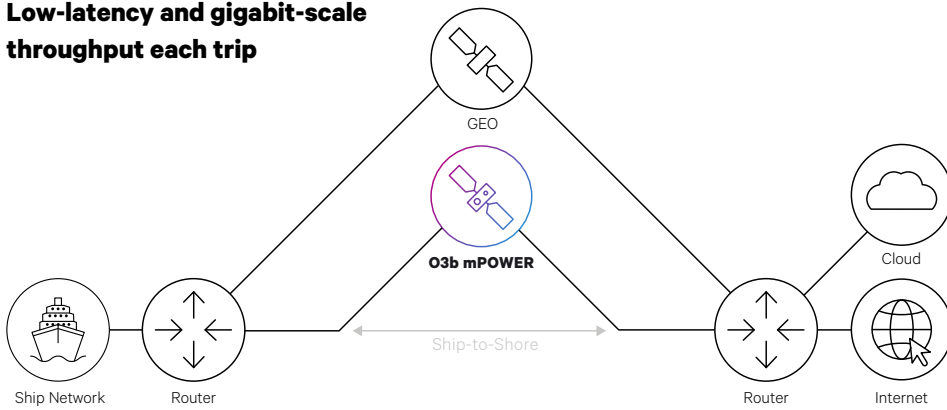
MOVING TOWARDS THE CLOUD

Guests and crews aboard vessels want to continue using the cloud-based services they access every day, including social media, video streaming, and online gaming platforms. More cruise lines are also investing in smart ship technology that continuously collects data for predictive maintenance, route optimisation, and weather monitoring— and can even provide guests using smart wearables with trip updates or activity recommendations. However, managing this volume of data effectively requires a robust, end-to-end connection to the cloud.

At SES, we recognised early how quickly the cloud is transforming the industries we serve. We took action to expand our partnerships with the world's leading cloud providers, and became the first satellite operator to develop direct peering relationships with Amazon Web Services and one of the first with Microsoft Azure. Through these partnerships, our multi-orbit fleet can deliver private dedicated connectivity to the cloud—for any cloud workload, in any location. O3b mPOWER raises the bar further, with its ability to adapt to changing network demand on the fly. This is critical for workloads that require cloud bursting, including ecommerce platforms, streaming services, and delivery apps that routinely experience sharp traffic increases.

End-to-end cloud-optimised connectivity available anywhere
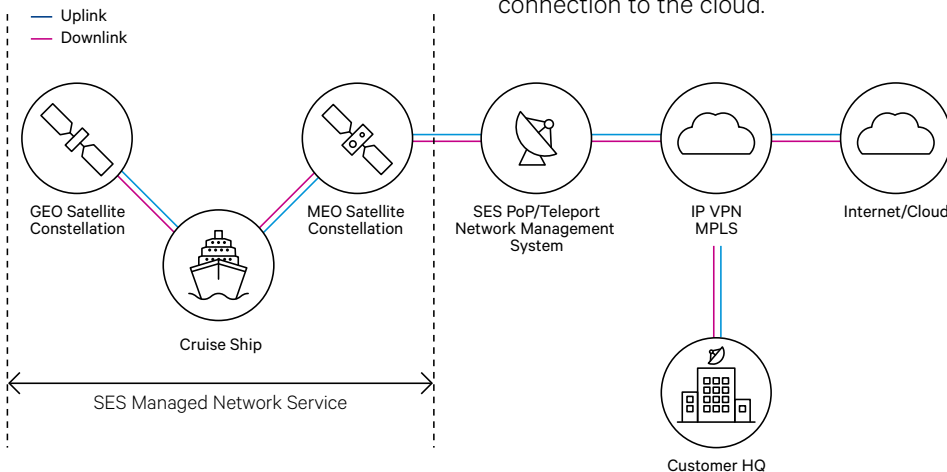
"Our cruise line customers have a fully-managed service—not just the end-to-end connection, but a full suite of adaptive traffic management capabilities that they can use to prioritise and manage the increasing volume of data that runs their operations, and that supports the overall guest experience. At SES, we're focused on helping cruise customers plan and execute their strategies over the next 10 to 15 years. With O3b mPOWER, we're able to provide a system that can scale with their plans to introduce new services and enhance customer experiences in innovative ways."

— Mark Bieberich, VP Portfolio & Segment Marketing

R&D LAB IN PORT ST. LUCIE
—
ENHANCING CRUISE CONNECTIVITY SOLUTIONS

In March 2021, we opened a testing facility to duplicate the cruise ship environment. Below deck, dual data centres installed on customer vessels can be integrated with potential software solutions. These are connected to above-deck antennas set up with different devices, such as state-of-the-art low-noise block downconverter (LND) boxes. The tests we perform with this equipment enable us to simulate and optimise our services before they're deployed for customers.
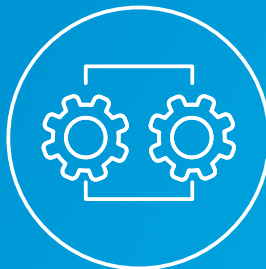
STRENGTHENING CUSTOMER RELATIONSHIPS

Through our Port St. Lucie facility, we're able to bring more value to the cruise industry in several ways:

Enabling existing and potential customers to see product demonstrations

Mitigating the risk of connectivity issues to maximise QoS

Testing configurations with new satellite systems, including O3b mPOWER

Identifying software integrations ideal for improving service performance and flexibility

Allowing customers to co-locate and test their equipment on-site

"Here at SES, we take the needs of our customers and their guests very seriously and are dedicated to making sure that they get the best experience possible. That's why we've invested heavily in a lab that replicates the connectivity cruise ships receive and verifies that any changes we make to our services result in consistent, if not superior, experiences for all passengers onboard a vessel."

— Jarrod Lamphere, Senior Manager, Maritime Systems

DIVE DEEPER INTO THE TOPICS DISCUSSED

SES Networks Transforms Cruise Market Again as Leading Cruise Companies Choose O3b mPOWER for Enhanced Connected Guest Experiences ▶

Empowering Extraordinary Experiences at Sea ▶

Expanded Partnership with SES to Give Princess Cruises First Access to Ground-Breaking O3b mPOWER Satellite-Based Communications System ▶

Royal Caribbean Cruises Transforms Connectivity at Sea with SES ▶

O3b mPOWER: Cruise & Maritime ▶

To learn more about our partnership with the cruise industry, visit
www.ses.com/find-service/cruise

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