



NUCLEAR ENERGY IN MARITIME

A Focus Series on **Advanced Nuclear Technology**



ISSUE

2

The Pulse of Public Perception:
Nuclear Power and the Path Forward

Table of Contents

On the Horizon 2

The Pulse of Public Perception 3

Risk Engineering: Building Trust Through Design 5

The Quest for Cleaner Energy 6

The Path Forward 7

Food for Thought 8

ON THE HORIZON

In a world increasingly defined by regulatory reforms, energy security and technological acceleration, nuclear power is again stepping into the spotlight, but not without thoughtful and balanced consideration of the risks. While the public's perception of nuclear power remains complex for various reasons, there is a new narrative emerging. Not one that is shaped by historical anxieties and past incidents, but by the need for cleaner, more reliable energy and the evolving values of a generation far removed from times past.

Perceptions about nuclear power are a shifting landscape that should be viewed through a

contemporary lens to carefully examine the place of nuclear-powered vessels within the maritime industry, how risk is understood and engineered, and how international and regional regulations create a path for nuclear implementation.

Addressing public perception is a critical piece of the puzzle. This means unpacking important concerns such as safety, radiation, cost and waste to understand how nuclear power is being perceived and how it can potentially be embraced in a changing world. Rather than revisiting the past, we're placing a finger on the pulse of today's conversations and innovations that will shape tomorrow's energy decisions.

To the skeptic — let the empirical record **replace fear with understanding**. To the optimist — let the weight of responsibility **temper zeal with vigilance**.

THE PULSE OF PUBLIC PERCEPTION

Despite peaceful commercial applications of nuclear technology — with low fatality rates compared to other energy sources and other industrial work environments — a small number of high-profile past incidents have overshadowed the overall positive and ever-improving safety record for nuclear energy.

Though emotional imprints among older generations may remain, perception is evolving as younger generations begin to reframe the narrative surrounding nuclear power. Surveys show rising support for nuclear energy, with younger respondents becoming more open to its use in energy resilience and carbon reduction. According to Bisconti Research, U.S. public support for nuclear energy remains high with 72 percent of people favoring its use and 28 percent of people opposing its use.

DID YOU KNOW?

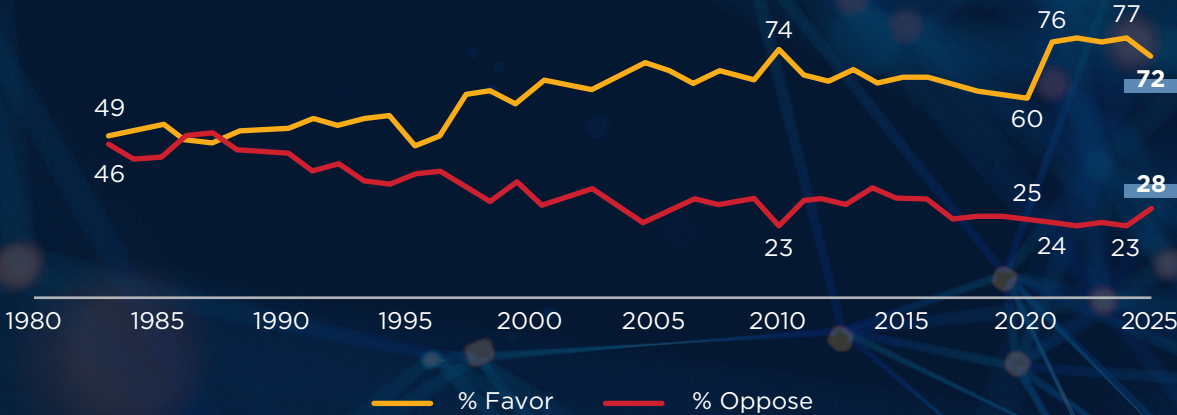


NUCLEAR GOES VIRAL:

In 2024, a Texas A&M University student held up a sign on national TV that read, "I ❤️ Nuclear Energy." The message went viral, inspiring similar signs at college football games across the country — from Berkeley, California, to Baton Rouge, Louisiana.

Source: Texas A&M University, engineering.tamu.edu

Figure 1. U.S. Favorability to Nuclear Energy 1983-2025



Source: www.bisconti.com

EVERYDAY RADIATION EXPOSURE:

Everyday activities often expose us to more radiation than living next to a nuclear facility. In fact, spending an entire year near a nuclear power plant exposes you to less radiation (0.01 millisieverts or less) than taking a single 10-hour flight (0.037-0.05 millisieverts) or even eating bananas regularly (which contain naturally occurring radioactive potassium).



DID YOU KNOW?

However, the demand for more transparency, better communication and a clear application plan accompanies the public's openness. For them, nuclear implementation must be about powering the future in a manageable and affordable way, not repeating the past.

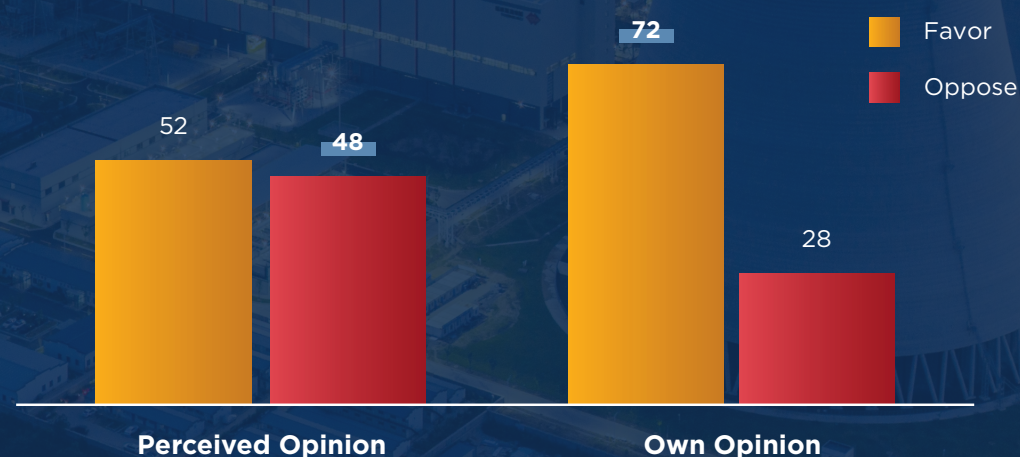
THE PERCEPTION GAP

When it comes to nuclear energy, there's often a gap between what people personally believe and what they think others believe. For example, surveys show that while a strong majority of individuals may support nuclear energy, many of those same people assume their community or the broader public is less supportive. This perception gap can influence how openly people express their views and how quickly new technologies are accepted.

Misjudging public sentiment can slow down conversations, innovation and policy progress, as leaders may be reluctant to act without substantial support.

When it comes to nuclear energy, there's **often a gap** between what people **personally believe** and what they think **others believe**.

Figure 2. The U.S. Perception Gap of Nuclear Energy



Source: www.bisconti.com

RISK ENGINEERING: BUILDING TRUST THROUGH DESIGN

Risk engineering in nuclear power isn't just about meeting regulatory and safety requirements; it's about designing systems that earn public trust. Today's advanced reactors and maritime applications feature enhanced inherent safety and improved engineering resilience.

For example, in issue 1, we mentioned how modern small modular reactors (SMRs) are built with inherent and passive safety systems. Modern nuclear designs for ships and floating platforms can use these systems to shut down reactors safely without operator intervention or external power. This is crucial at sea, where immediate human or grid response may not be possible. Next-generation reactors, like Generation IV, are designed to handle extreme conditions, adapt to disruptions and recover quickly —qualities essential for seaborne operations where isolation and harsh environments are the norm.

Agencies like the International Maritime Organization (IMO), International Atomic Energy Agency and the World Nuclear Transport Institute are working to standardize best practices, provide regulatory language and strengthen regulatory interoperability. This unified approach is vital for vessels that cross international waters and docks at ports worldwide.

SAFETY FEATURES OF SMRs

- ✓ Advanced coolants
- ✓ Operation at atmospheric pressure
- ✓ Engineered containment
- ✓ Stability at low power

DID YOU KNOW?

CORE DAMAGE FREQUENCY (CDF) is a key safety metric for nuclear reactors, estimating the likelihood of a major accident. For advanced designs, CDF is approximately 1 in 100 million reactor operating years (1×10^{-8}).



Nuclear energy alone **maintains atom-level custody** of every material to ensure that its **true cost is not deferred** to tomorrow.

THE QUEST FOR CLEANER ENERGY

Energy is a universal currency, and every currency has a cost. Fossil fuels have long been valued for their energy density, availability and affordability. However, their convenience is now subject to increasingly strict regulations on safer, more secure energy.

The IMO has set emissions reduction targets for the shipping industry, outlining a 50 percent reduction in greenhouse gas emissions by 2050 compared to 2008 levels. These goals are driving a fundamental transformation in how assets are powered and how the industry thinks about energy.

While alternative fuels like ammonia, hydrogen and biofuels are being explored, each comes with its own technical, economic and safety hurdles. Nuclear energy is emerging as a serious candidate for cleaner energy with a range of strategic uses. For example, as part of a joint development project between ABS, Core Power and Athlos, feasibility studies are underway to explore floating nuclear power plant deployment to support the energy needs of islands, ports, and coastal communities in the Mediterranean Sea.

As the industry seeks scalable, reliable and low- or zero-emission solutions, policy incentives, such as tax credits and proposed legislation (the SHIPS for America Act in the United States), could support the adoption of nuclear energy in the commercial maritime sector.

Speaking at the Core Power Argo Conference, ABS Chairman and CEO Christopher J. Wiernicki emphasized nuclear's unmatched energy density, reliability and strategic independence, making it a credible long-term solution for emissions reduction and the future of global shipping.

Nuclear is a credible **long-term solution** for the future of shipping.

DID YOU KNOW?



RADIATION SAFETY PRINCIPLES:

The nuclear industry adheres to the as low as reasonably achievable principle, prioritizing minimal radiation exposure even at significant cost and effort. In contrast, general industrial safety follows the as low as reasonably practicable approach, balancing risk reduction with practicality to avoid disproportionate efforts.

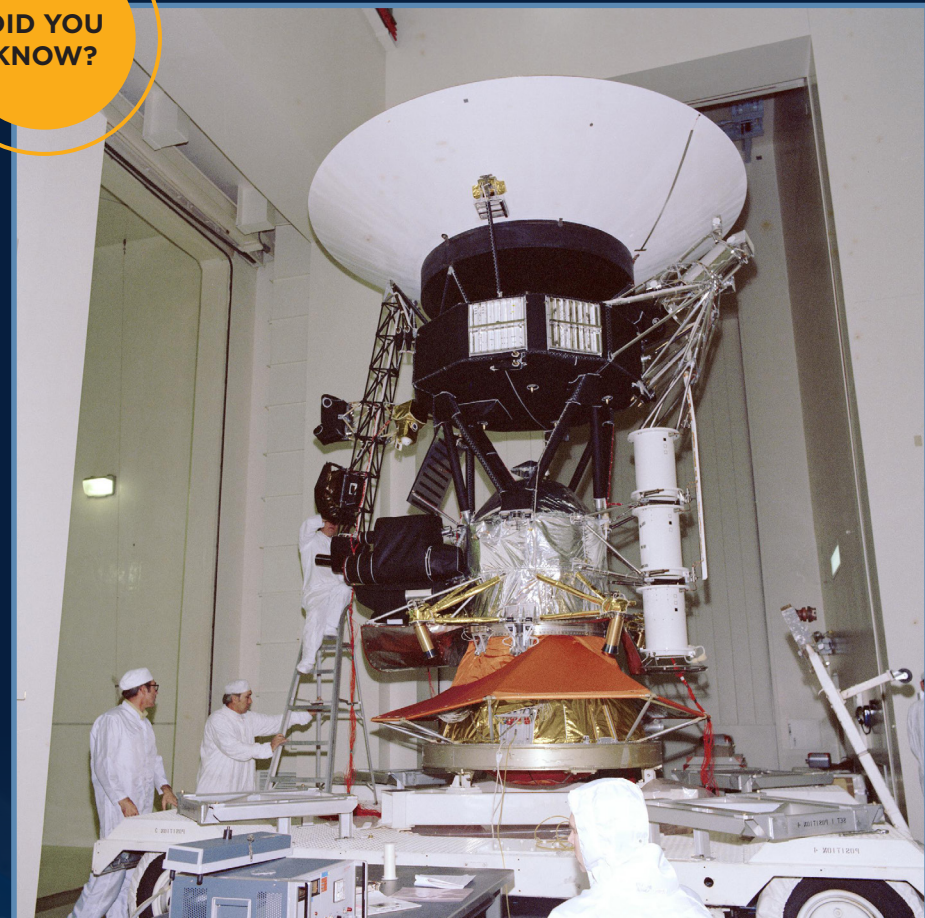
THE PATH FORWARD

As society considers the future of nuclear energy, it's important to acknowledge and grow from the challenges of the past. For nuclear to play a meaningful role in addressing global energy needs and meeting sustainability goals, the industry must:

- Build public trust through transparency and education.
- Demonstrate the safety and reliability of next-generation reactors.
- Foster international regulatory alignment and collaboration.

With advancing technology and shifting public attitudes, nuclear power could offer the maritime industry a viable alternative toward achieving its goals — if stakeholders are willing to collaborate, engage, innovate and lead.

DID YOU KNOW?



Voyager 1, launched in 1977, is a nuclear-powered spacecraft that has been traveling for over 48 years, making it the most distant human-made object. Currently about 23.5 light-hours (15.7 billion miles) away, it's projected to reach one light-day from Earth by late 2026. Its longevity is thanks to a radioisotope thermoelectric generator (RTG), which uses heat from decaying Plutonium-238 to provide power, allowing it to function for nearly half a century in the dark expanse of space.

Image source: NASA/JPL-Caltech

FOOD FOR THOUGHT

- What role should nuclear play in the broader portfolio of alternative fuels and technologies for shipping?
- How can the maritime industry help communicate the benefits and safety of modern nuclear propulsion to port communities and the public?
- How can the maritime industry balance transparency about nuclear technology with the need for security and regulatory compliance?
- What kind of partnerships are essential to make commercial seaborne nuclear energy a reality?
- How can regulatory bodies, classification societies and nuclear regulators better collaborate to help implement nuclear energy for the industry?

Join the Nuclear Maritime Conversation

What are your thoughts on nuclear power in maritime? Do you see it as a viable solution for powering maritime operations? Join the conversation by sharing your insights, questions or concerns in our upcoming industry roundtable discussions. We welcome your insights!

Have questions about nuclear maritime applications? **Let us know.**



www.eagle.org/nuclear

Want to collaborate on nuclear maritime research? **Reach out.**



nuclear@eagle.org

Follow this miniseries for more insights on maritime nuclear.



American Bureau
of Shipping



@ABSeagle



Follow the latest developments and conversations by downloading issue 1 of our nuclear focus series, available to download today at www.eagle.org/nuclear.



1701 City Plaza Drive | Spring, TX 77389 USA
1-281-877-6000 | sustainability@eagle.org
www.eagle.org

© 2025 American Bureau of Shipping.
All rights reserved.