

Future Thinking S2 E4: The roadmap to bring nuclear to commercial shipping

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<v SPEAKER_1>Hello and welcome to Future Thinking, an Alongside mini-series from North Standard, one of the world's leading marine insurers.

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<v SPEAKER_1>I'm Helen Barden, and in this mini-series, we will, with the help of my guests, navigate our way through some elements of maritime decarbonization.

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<v SPEAKER_1>In this penultimate episode, I'm joined by Mikal Boe, Chair and CEO of CorePower.

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<v SPEAKER_1>CorePower is a market-leading innovation company specializing in scalable new nuclear power technology for ocean transport and heavy industry.

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<v SPEAKER_1>Mikal is actively engaged in the nuclear community, serving on related advisory boards and committees internationally.

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<v SPEAKER_1>Thank you for joining me today, Mikal, and welcome to the Alongside podcast.

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<v SPEAKER_2>It's nice to be here, Helen.

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<v SPEAKER_1>It's great to have you on the podcast because certainly over the past couple of years, and I think especially since the International Maritime Organization's revised greenhouse gas strategy in 2023, there is a lot more talk about nuclear as being part of the energy transition and a way in which the shipping industry might actually meet the revised greenhouse gas target of getting to net zero around 2050.

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<v SPEAKER_1>And I heard you say at the new nuclear in maritime summit in June, that you could see nuclear contributing to reducing emissions in shipping between 25 to 50% in the future, which is obviously a significant amount.

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<v SPEAKER_1>And I'm sure you'd probably also agree that there's a lot of work to do to get to that point.

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<v SPEAKER_1>So I wonder if we could just have a little look at some of the challenges and work to be done, I suppose, in terms of getting nuclear in maritime to that point.

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<v SPEAKER_1>And one of the first elements of work that I know you're very busy working on is around the technology.

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<v SPEAKER_1>So perhaps you could give the audience a bit of information about the preferred technology that CorePower is looking at and how that development of the technology is going.

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<v SPEAKER_2>Before I do that, Helen, I think it's probably worth setting the scene so that it's obvious what the narrative is around this.

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<v SPEAKER_2>Why nuclear, why not something else?

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<v SPEAKER_2>And if we're going to use nuclear, why are we choosing different technologies from the one that exists today?

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<v SPEAKER_2>And I think it comes down to a few basic things.

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<v SPEAKER_2>I mean, it's not just something that's happening in shipping, in maritime ports, and in our sector.

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<v SPEAKER_2>It's happening all over the world.

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<v SPEAKER_2>People are starting to actually realize that, what matters in dealing with greenhouse gases isn't beliefs, it isn't hope, and it isn't some wishful thinking that we can solve this in some simple way.

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<v SPEAKER_2>It comes down to chemistry, it comes down to physics, it comes down to the laws of nature, and the gradual realization that there's simply not going to be any net zero without nuclear.

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<v SPEAKER_2>Nuclear is not going to be the solution to everything, but if you're going to replace reliable energy sources, the stuff that we've built our world on today, we need to replace that with something that doesn't emit, and the only energy source we have that doesn't emit anything is nuclear.

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<v SPEAKER_2>And we know that nuclear at sea works really well.

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<v SPEAKER_2>Over 700 reactors have operated at sea, but they've been operating really for the most part in a military domain, and those military domain naval reactors, if you like, cannot be commercially insured.

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<v SPEAKER_2>And since they cannot be commercially insured, we can't bring them into ports.

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<v SPEAKER_2>And if we can't bring them into ports, well, there's not much we can do with them in the commercial maritime business.

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<v SPEAKER_2>So that's one side of it.

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<v SPEAKER_2>The other way is, of course, that nuclear is an industry that's gone for economies of scale.

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<v SPEAKER_2>I mean, in order to make these massive construction projects affordable, you need to build bigger and bigger as we go along.

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<v SPEAKER_2>And there is a better way to do this, enabling nuclear to be delivered on time and at an affordable price.

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<v SPEAKER_2>We believe that if we can build floating nuclear power plants in shipyards with the right technology, we get the combination of both things.

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<v SPEAKER_2>We get to deliver clean energy to industry, transport and infrastructure.

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<v SPEAKER_2>And we create that independence, that energy independence, energy security, which pulls hungry assets off the grid and makes the job of wind and solar that start being invested in so much easier.

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<v SPEAKER_2>We also know that approximately 7,000 of the largest ships in the global fleet today emit about 50% of greenhouse gas emissions.

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<v SPEAKER_2>So there's an immense opportunity to use these new technologies to both eliminate greenhouse gas emissions and improve energy efficiency.

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<v SPEAKER_2>It's not just about greenhouse gases, it's about getting a better system as well.

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<v SPEAKER_2>We think this is a \$6 trillion market between now and 2060.

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<v SPEAKER_2>And as the pendulum of geopolitics swings towards more regional trade blocs, that opportunity to build that market in and around the OECD could really revitalize shipbuilding and manufacturing and those industries in the Atlantic, in Europe and North America, et cetera, which we see as a big benefit.

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<v SPEAKER_2>So the technologies that we're pushing forward for, these are the ones that meet the criteria for commercial insurance in the maritime industry.

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<v SPEAKER_2>Commercial insurance is absolute must in all of this.

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<v SPEAKER_2>And the technologies that do really well out of those criteria is the molten salt reactor and something called the heat pipe reactor.

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<v SPEAKER_2>Both are being developed today and will be with us commercially available in the early 2030s.

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<v SPEAKER_1>I think it's really interesting that you talk about, I suppose, the use of nuclear, how you see that providing energy in terms of like a floating storage and outside of just having that as propulsion on a ship.

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<v SPEAKER_1>Do you also see it working in tandem with the other fuels that are currently on the table as being future fuels?

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<v SPEAKER_1>So the likes of ammonia, where there is going to be a need, if we're going to be looking at green ammonia, to produce that green hydrogen, which is obviously a very energy-intensive process.

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<v SPEAKER_2>You know, the thing with the green hydrogen is that there is not much we can do about the physics and chemistry of how it works and how it's going to be made.

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<v SPEAKER_2>I mean, if you're going to make green hydrogen, you have to make it through electrolysis of water, and that takes a certain amount of energy.

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<v SPEAKER_2>There's nothing we can do, nothing anyone can do to change how much energy is required to split that water into hydrogen and oxygen, and that's why it's so difficult.

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<v SPEAKER_2>So if you're going to have these vast amounts of reliable 24-hour-a-day energy, which is clean in itself, to make that hydrogen, which is a feedstock for ammonia and other synthetic fuels, you're going to have to have a nuclear option in order for it to work.

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<v SPEAKER_2>It's the only way for it to become affordable as well.

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<v SPEAKER_2>So absolutely see that as one of these things that floating nuclear power plants can do.

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<v SPEAKER_2>I mean, the advantage of a floating nuclear power plant is that it's constructed as a fully modular, small power plant.

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<v SPEAKER_2>It's not civil construction.

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<v SPEAKER_2>It's built in the shipyard, just like we build ships, and it is floated into place.

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<v SPEAKER_2>All of the workforce that manufactures it stays in the same place.

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<v SPEAKER_2>We float that into place, and we're able then to make fuel out of, or that can power the production platforms that produce fuel from air and water, which is what ammonia is at the end of the day.

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<v SPEAKER_2>So that's absolutely right.

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<v SPEAKER_2>I mean, hydrogen, the other thing with hydrogen, Helen, of course, is that it's not transportable.

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<v SPEAKER_2>You can't efficiently transport something so light in quantities like that.

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<v SPEAKER_2>So you really want to make these fuels where they're needed.

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<v SPEAKER_2>So the ability then to set up that kind of ammonia and synthetic fuel refineries in the ports or in the areas where they're needed, that's going to need power in those areas, and that's where the floating nuclear power plant, the FNPP, really comes into its own.

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<v SPEAKER_1>I suppose one of the other things with these new fuels as well is the cost side.

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<v SPEAKER_1>So when we're moving away from fossil fuels and into the energy transition and whether we're looking at nuclear or whether we're looking at alternative fuels like ammonia or methanol, the issue of cost obviously comes into play and the concern around, well, how much is all this going to cost?

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<v SPEAKER_1>Something that I took away as being a very interesting comment when I attended the new Nuclear Maritime Summit was there was a comparison between the life cost of a 15,000 TEU methanol ship and a 15,000 TEU nuclear powered ship.

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<v SPEAKER_1>And with the CAPEX and the OPEX cost for the methanol ship, it was 2.7 billion life cost and for the nuclear powered ship, it was a 1 billion life cost with the CAPEX cost on the basis that that is the cost you don't have to obviously keep refuelling the ship in the same way that you do with a methanol vessel.

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<v SPEAKER_1>So there obviously is a view that it's going to be competitive when we're looking at the cost side of things.

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<v SPEAKER_1>I just wondered if you wanted to elaborate on that as well.

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<v SPEAKER_2>With future costs, predicting the price of oil is probably the most futile thing that anyone can do.

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<v SPEAKER_2>So predicting the cost of energy in the future is probably equally futile, Helen.

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<v SPEAKER_2>But I do think the numbers for a large ship like 15,000 TEU container vessels operating at full design service being on green methanol at 2.7 billion sounds rather low.

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<v SPEAKER_2>I think it's going to be rather a lot more than that.

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<v SPEAKER_2>We need to think about this in terms of the, what you get from the energy that you have.

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<v SPEAKER_2>I mean, if the energy source that you're relying on is not available, then it doesn't really matter how much it costs.

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<v SPEAKER_2>It's the energy that you don't have that is the costliest of all.

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<v SPEAKER_2>So the whole point really of a nuclear powered vessel is that it's fueled for life.

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<v SPEAKER_2>You never have to bunker it.

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<v SPEAKER_2>You never have to stop and refuel it.

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<v SPEAKER_2>It carries on.

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<v SPEAKER_2>It does millions of miles on a single fuel load.

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<v SPEAKER_2>And that energy is already there.

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<v SPEAKER_2>It's not something that you have to worry about the cost of.

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<v SPEAKER_2>Now clearly, if we build nuclear the way we do today, sort of one plant at the time, prototyping forever, things are always going to be very expensive.

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<v SPEAKER_2>There's nothing special about nuclear in that sense.

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<v SPEAKER_2>I mean, everything that you prototype costs a huge amount of money.

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<v SPEAKER_2>And if you're building a one-off ship in a shipyard, it's going to be monstrously expensive.

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<v SPEAKER_2>You have to build a series of them.

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<v SPEAKER_2>So this idea that we build fully modular construction, build series of nuclear ships, series of floating nuclear power plants in large numbers, it's kind of the same product again and again and again.

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<v SPEAKER_2>The cost comes down dramatically, as does the cost of the reactor systems, as does the cost of nuclear fuel.

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<v SPEAKER_2>Once you've got that, you don't really need to think about the cost of that energy that you've got.

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<v SPEAKER_2>So, you know, I think cost-wise, this is going to be extremely competitive.

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<v SPEAKER_1>Another challenge I see in relation to public perception, which I suppose then feeds into the kind of political will.

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<v SPEAKER_1>How do you think the nuclear industry can go about breaking down those barriers when it comes to any negative public perception of nuclear and nuclear ships going into, or commercial nuclear ships going into ports?

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<v SPEAKER_2>This is changing all the time.

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<v SPEAKER_2>I mean, whether something is popular or unpopular is very much to do with the narrative and discourse in the public domain.

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<v SPEAKER_2>And to be fair, we've been taught, we've been taught very well to be afraid of nuclear by those who stand to profit from nuclear not being part of our energy mix.

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<v SPEAKER_2>I was always shy about this.

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<v SPEAKER_2>I mean, the reason why nuclear, which has the most incredible safety track record of any energy system out there is being touted as something that isn't safe or something that you can't trust, et cetera, is a gross misperception of how the system works.

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<v SPEAKER_2>Now, obviously, in the very early days of any technology, people make mistakes, things happen, et cetera, et cetera.

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<v SPEAKER_2>But 80 years of civil nuclear energy development has produced the smallest number of injuries and deaths of anything that you can compare it with.

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<v SPEAKER_2>It's quite laughable, actually, that it's like that.

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<v SPEAKER_2>But people have found to realize this.

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<v SPEAKER_2>A little bit of information goes an awful long way in this.

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<v SPEAKER_2>And we've found that by having discussions about how this actually works and what actually happens when you use nuclear technology and energy systems, we have that conversation with professionals in the shipping industry, with ministers in government, with youngsters at universities, with anyone, really.

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<v SPEAKER_2>We find that little information goes an awful long way.

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<v SPEAKER_2>And it's sort of, you start to get familiar with what it actually is.

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<v SPEAKER_2>That fear disappears very quickly.

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<v SPEAKER_2>I think public perception on nuclear is changing rapidly.

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<v SPEAKER_1>Yeah, and I suppose as part of that as well, it's the technology that's being developed is being developed so that it is suitable in the maritime space.

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<v SPEAKER_1>And also alongside that, there needs to be the development in relation to the regulatory landscape.

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<v SPEAKER_1>In terms of what you think needs to be done from a policy side, I would think there needs to be discussions, not just from the UN's nuclear organisation, but also the UN's maritime organisation to develop international regulations.

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<v SPEAKER_1>How are those conversations going at the moment?

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<v SPEAKER_2>We love those conversations, Helen, because what we actually know and what people realise is that the rules and regulations are already in place.

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<v SPEAKER_2>They were put in place during the 60s and 70s, and they're extremely well thought through, but they were thought through for that time.

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<v SPEAKER_2>So they were appropriate for what we had in the 60s and 70s.

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<v SPEAKER_2>It's very different from what we have today.

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<v SPEAKER_2>It was also pre a lot of development of international safety standards, security standards at the IMO and the IEA.

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<v SPEAKER_2>I mean, the world has moved on enormously since the 60s and 70s in our lifetime, actually.

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<v SPEAKER_2>And what we're finding is that there is very little that needs to be done in terms of new stuff that needs to come to the market.

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<v SPEAKER_2>We kind of need to revise the stuff that's there to make sure that it's relevant for today.

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<v SPEAKER_2>And it's not as big a task as people think.

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<v SPEAKER_2>The interesting bit is when you start to overlay the nuclear safety security standards with the maritime safety security standards, you find that there are some gaps in there.

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<v SPEAKER_2>They're not fundamental or no showstoppers, but it does require a collaboration between one tribe on one side of the river, which is nuclear, and another tribe on the other side of the river, which is maritime.

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<v SPEAKER_2>They don't really speak each other's language.

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<v SPEAKER_2>So we've taken on that role of translating what maritime needs from nuclear and what nuclear needs from maritime, and then forming this new NGO, the Nuclear Engine Maritime Organization, NEMO, which is applying for NGO status at both IAEA and IMO, and really helping regulators through that difficult work of trying to understand what it actually means to take maritime safety rules and nuclear safety rules and put them together.

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<v SPEAKER_2>But the framework's already in place.

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<v SPEAKER_2>So the conditions for how this is going to work have been set, they've been agreed by the industry, and that's been transmitted to both the IMO and the International Energy Agency, the IAEA, for a revision of those safety standards, both for floating nuclear power plants and for nuclear ships.

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<v SPEAKER_2>And we expect to see very substantial progress being made by the international community to bring those standards up to date in the coming few years so that new nuclear for maritime can be commercialized already in the early 2030s.

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<v SPEAKER_2>The Director General of the IAEA, Rafael Grossi, that many people have seen on television and in the newspapers, called publicly for a roadmap to be created so that the IMO and the IAEA could get on and actually get this done, because it's such an important part of Net Zero, not just for nations, but for global trade as well.

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<v SPEAKER_2>So that's a message from the top that we've taken to heart, and we're creating that roadmap now for the regulators.

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<v SPEAKER_1>Yeah, I mean, it's obviously extremely necessary work, and from an insurer's perspective, one of the kind of regulatory areas that we focus in on, to some extent, is liability frameworks when it comes to various fuels.

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<v SPEAKER_1>So in terms of nuclear, like you say, it's not necessarily that it's starting from scratch.

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<v SPEAKER_1>There has been a convention in the past looking at this.

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<v SPEAKER_1>It's just not been ratified or it's not entered into force and will need to be looked at and updated and any gaps filled in.

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<v SPEAKER_1>But it's not necessarily a case of having to start from scratch.

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<v SPEAKER_1>But it's not just, I suppose, the IMO and the IAEA.

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<v SPEAKER_1>It's also ensuring that the countries within those organizations are pushing in the right way for the required regulations as well and making sure that the industry is speaking to those organizations to get these regulations put in place as soon as possible, because we all know it's not a quick process to come up with conventions.

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<v SPEAKER_2>And anything in the international community takes time, because it's all based in consensus.

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<v SPEAKER_2>What we do see though is that we see member states now, key member states, not just any old pockets around these two IGOs, but key member states, tier one member states, standing up and going, right, this needs to be done.

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<v SPEAKER_2>This is important.

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<v SPEAKER_2>This needs to get done.

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<v SPEAKER_2>We have the ability to do this because we've got a competent nuclear authority and we've got a competent maritime authority, and we will leave it up to them to get this done.

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<v SPEAKER_2>So we're starting to see that come through, and we're expecting this to be worked through over the next few years.

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<v SPEAKER_2>I mean, what you said about liability is very important because there are many things that are important when you think about nuclear and maritime, but liability insurance is the absolute number one, because without it, you can't enter into an airshore environmental report.

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<v SPEAKER_2>Now, here's the key thing.

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<v SPEAKER_2>I tried to say this earlier on.

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<v SPEAKER_2>I'll try and unpack that a little bit with these conventional nuclear technologies, the ones that those standards were written for back in the 60s and 70s, that simply isn't possible.

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<v SPEAKER_2>And the reason for it is to do with emergency planning.

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<v SPEAKER_2>And when you've got emergency planning duties, and that emergency planning zone is moving, it's moving across towns and schools and farms and communities.

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<v SPEAKER_2>And there is just no way, even how hard you try, that you can maintain responsibility for emergency planning in that area.

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<v SPEAKER_2>Insurers aren't going to do it.

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<v SPEAKER_2>So the reason we don't have nuclear ships today isn't because nuclear doesn't work.

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<v SPEAKER_2>It's not because it's too expensive or it isn't safe.

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<v SPEAKER_2>It's simply because you can't commercially insure it.

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<v SPEAKER_2>So the conditions for commercial insurance are sort of technical, and that technology that we're developing now is the one that really changes that whole landscape.

00:19:46.923 --> 00:19:57.123

<v SPEAKER_2>So now the liability conventions for nuclear-powered ships were developed actually back in the 1950s, and it was in the early 1960s that was just about to be signed.

00:19:57.143 --> 00:20:06.443

<v SPEAKER_2>It was the 25th of May, 1962, just about to be signed by over 50 member states, and then the Bay of Pigs happened.

00:20:06.963 --> 00:20:14.383

<v SPEAKER_2>And there was a massive standoff around nuclear, and it proliferated through politics, and they said, we're not going into this.

00:20:14.403 --> 00:20:15.783

<v SPEAKER_2>And lots of things happened.

00:20:15.823 --> 00:20:24.863

<v SPEAKER_2>Lots of things happened in the background that caused both the Americans and the Soviets to pull away from signing this liability convention.

00:20:24.883 --> 00:20:28.123

<v SPEAKER_2>And so Venezuela died a death, and nothing happened again.

00:20:28.143 --> 00:20:44.083

<v SPEAKER_2>So now, all these years later, 62 years later, we're now in a position where we can take all that excellent work that was done and we can get modernized, make it suitable to the modern world and to the technologies being developed, and revisit how that's done.

00:20:44.103 --> 00:20:53.063

<v SPEAKER_2>Because if the conditions for commercial insurability is there, that convention can be brought back to the table and ratified once that work is done.

00:20:53.083 --> 00:21:05.843

<v SPEAKER_2>But we kind of need the IAEA and the IMO to make sure that standards are set, so we can have safety standards and security standards that are uniformly agreed in the international community for that then to sit on top.

00:21:05.863 --> 00:21:07.403

<v SPEAKER_2>It's kind of part of that roadmap.

00:21:07.523 --> 00:21:17.983

<v SPEAKER_1>It will be very interesting to see the roadmap and see the elements that are considered to be necessary in order to get nuclear to commercial shipping.

00:21:18.743 --> 00:21:20.603

<v SPEAKER_1>It's been a really interesting conversation.

00:21:20.623 --> 00:21:40.063

<v SPEAKER_1>I suppose if we just end by assuming that all of these hurdles are achieved and we get to a point where we have nuclear-powered ships on the water, how do you envisage that a nuclear-powered ship will look in terms of the operational side?

00:21:40.443 --> 00:21:41.983

<v SPEAKER_2>That's a good question, Helen.

00:21:42.063 --> 00:22:03.763

<v SPEAKER_2>It's not one that I think we can predict fully because there's so much more work to be done in how crewing is going to function, how training of crews is going to work, how systems and board are interlinked, how electronics are going to function on these vessels.

00:22:04.163 --> 00:22:07.703

<v SPEAKER_2>But we're starting to see the outline of what this might look like.

00:22:07.923 --> 00:22:17.783

<v SPEAKER_2>And it's sort of taking the basic approach that in order to be able to operate a nuclear reactor or a nuclear system, you have to be a licensed operator.

00:22:18.143 --> 00:22:29.963

<v SPEAKER_2>So the chance is that at least in the first few generations, most ship owners or shipping companies that would operate vessels will not want to become licensed nuclear operators.

00:22:29.983 --> 00:22:30.583

<v SPEAKER_2>Not straight away.

00:22:30.603 --> 00:22:32.603

<v SPEAKER_2>It's got a high barrier to entry there.

00:22:32.603 --> 00:22:34.883

<v SPEAKER_2>It's a lot of investment required to be able to do that.

00:22:35.463 --> 00:22:54.083

<v SPEAKER_2>So you can start to see the formation of these joint ventures, joint adventures, if you like, in investment in these vessels, which are then potentially on long-term leases to operators rather than being owned by individual companies, which of course changes the way that we think about the S&P market.

00:22:54.383 --> 00:22:56.163

<v SPEAKER_2>It changes the way we think about financing.

00:22:56.183 --> 00:23:00.803

<v SPEAKER_2>It changes the way we think about flags and classification and insurance as well.

00:23:00.823 --> 00:23:19.543

<v SPEAKER_2>So you sort of, at least in the first generation, you're coming back to more of this industrial carriage concept, where instead of having a ship that's there as a sort of tradeable asset, if you like, it's more one that is inserted into the value chain between shippers and receivers on fixed trades.

00:23:19.563 --> 00:23:26.823

<v SPEAKER_2>I mean, think about the iron ore trade, think about the engine trade, think about the grain trade, think about containers, industrial components, durable consumer goods, that kind of thing.

00:23:27.203 --> 00:23:38.783

<v SPEAKER_2>You're inserting a completely zero, a true zero emission transport medium into that value chain that is able to do a lot more than what current vessels are able to do.

00:23:38.823 --> 00:23:44.003

<v SPEAKER_2>One of them, for example, could be powering the loading and discharging air in ports.

00:23:44.423 --> 00:23:51.603

<v SPEAKER_2>So the ship is responsible for the clean energy that powers the port operations that it's in.

00:23:52.043 --> 00:23:57.483

<v SPEAKER_2>You have no need for slow steaming because you really don't need to save energy.

00:23:57.503 --> 00:23:58.303

<v SPEAKER_2>Your energy is there.

00:23:58.323 --> 00:23:59.743

<v SPEAKER_2>You can use it as you see fit.

00:23:59.763 --> 00:24:05.963

<v SPEAKER_2>So you can potentially achieve full design service speed rather than trying to go slower.

00:24:06.443 --> 00:24:09.583

<v SPEAKER_2>You don't have any need to stop for bunkering.

00:24:09.603 --> 00:24:11.143

<v SPEAKER_2>So you can change your routing.

00:24:11.243 --> 00:24:14.503

<v SPEAKER_2>You don't have to go via bunker ports, et cetera.

00:24:15.083 --> 00:24:27.583

<v SPEAKER_2>And you can start thinking more along the lines of what can a fully electric ship do in terms of taking full advantage of all of the new electronic and digital systems that are coming down the line.

00:24:27.603 --> 00:24:39.223

<v SPEAKER_2>So you get a more, I hate to say it, but a more sophisticated vessel in terms of its ability to manage a closed area network and cyber and all that kind of thing.

00:24:39.243 --> 00:24:45.243

<v SPEAKER_2>We see it as something that could potentially be quite disruptive and something that we're bringing the new generation of investors into this market.

00:24:45.363 --> 00:24:58.903

<v SPEAKER_2>And certainly something that I think the longer term shipping investors, longer term maritime participants are now starting to invest in.

00:24:58.923 --> 00:25:05.103

<v SPEAKER_2>Just like steamships sort of took the wind out the sail of the sailing ships, this has the potential to do the same sort of thing.

00:25:05.303 --> 00:25:07.823

<v SPEAKER_2>And that could be quite disruptive.

00:25:08.123 --> 00:25:12.243

<v SPEAKER_1>I suppose it requires a rethink in terms of investment and operational model.

00:25:12.503 --> 00:25:23.543

<v SPEAKER_1>It might be that it's kind of set up for utilizing, say, the green corridor kind of concept initially in terms of understanding how it will work.

00:25:23.983 --> 00:25:36.163

<v SPEAKER_1>So, yeah, I mean, it's been fascinating to talk to you today, Mikal, and thanks for guiding us through what a journey with nuclear in the commercial maritime space might look like.

00:25:36.363 --> 00:25:37.023

<v SPEAKER_2>Thanks, Helen.

00:25:37.043 --> 00:25:38.683

<v SPEAKER_2>It's been a pleasure to be on.

00:25:39.063 --> 00:25:43.583

<v SPEAKER_1>That's it for this penultimate episode of the Alongside miniseries.

00:25:43.923 --> 00:25:53.703

<v SPEAKER_1>Remember to listen to the other episodes in this miniseries where we look at the challenges and opportunities for shipping in the energy transition, as well as looking at sustainability through a wider lens.

00:25:54.263 --> 00:26:03.163

<v SPEAKER_1>In the final episode, I'll be speaking to Peter Jamieson of Boston Consulting Group, where we will go beyond just decarbonisation and look at sustainability more broadly.

00:26:03.803 --> 00:26:11.883

<v SPEAKER_1>You'll find the Alongside podcast and this miniseries on the North Standard website at northstandard.com or wherever you get your podcasts.

00:26:12.223 --> 00:26:15.823

<v SPEAKER_1>You can also click the link to ensure that you don't miss an episode.

00:26:16.243 --> 00:26:23.623

<v SPEAKER_1>So from me, Helen Barden, thank you for listening and bye for now.