

2024 Air and Space Power Conference Transcript – Operating in Northern Australia

Mr Cameron Smith

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CAMERON SMITH: Good morning, and thank you for the opportunity to speak here today. I've got to say, I do take immense pleasure in the absolute horror of my former Academy Air Force classmates, that he would see one of their Army classmates standing here at an Air and Power Conference. I'm also conscious we've had an excellent presentation here on the importance of our people and the psycho-safety of our people. For the jet pilots in the room, I know it's early, it's only 11:30. So, if there is anyone feeling a bit unsafe, I did notice outside there were cucumber sandwiches and they did say they can cut the crusts off to give you that comfort that you might need. (LAUGHTER) So, it's a pretty strange thing to be standing at an Air Power Conference, really representing what has traditionally been a mining company for Australia. What I want to do today is talk as much as I can and try and give you some understanding of the challenges that we face operating in remote environments, and some of the ways we've overcome those challenges. It's, you know, much like the Defence Force is constantly evolving to meet new threats, the reality is the marketplace and major industrial activities are changing, particularly with the onset of the cyber environment, the cyber domain, and also the introduction of AI and its impact on our operations. I'll start by giving you some sense of what Fortescue as a company is. So, Fortescue, not very old, established in 2003, but we're now the third-largest miner in Australia and the fourth largest-iron ore miner in the world. We mine about 200 million tonnes of iron ore per year that we ship into Asia. On any given day, we move about 2 million tonnes of earth around up on our mine sites. We do that with a market cap of the company of around about \$80 billion, an operating budget right around \$10 billion against revenues that come just under \$20 billion. Not the largest company, by any means, but certainly large enough. We're divided effectively into two major groups - the traditional company you may

be aware of, the mining company in the north-west and the Pilbara operations. That is the metals part of our business. Now expanding also in Africa and we have a significant exploration program globally, where we operate in a lot of remote environments, particularly in Latin America and also in Central Asia.

We also have started, about four years ago, an energy part of our business. And I will talk about energy resilience and energy independence towards the end of my presentation. That is a focus really on operating green hydrogen projects and enabling the technology and infrastructure needed to face the future energy matrix. That company is supported by Fortescue Capital, based out of New York, which is our fund, and then two technology companies. Fortescue Williams Advanced Engineering, based out of UK, the Williams Formula One company, and they work on zero-emissions power trains for major fleet and major vehicles. The second is my company, Fortescue Hydrogen Systems, a manufacturer of electrolysers, the machines you use to make green hydrogen for storage or use.

On the topic today of remote operations, I want to give you some commentary on the way we're laid out and the assets. And this will be the only slide that I need to refer to today. So, if you take a look there in the north-west of Australia, the distance from Port Hedland in the top down to the Chichester Hub on the bottom right there, is about 400km to 500km. Like military operations and the broader resource sector, our mines operate 24/7, 365. There is no shutdown of a mine at any point. Now, we heard yesterday the experience through the AEC. They have an incredibly large geographic area and a very, very compressed time frame. In many ways, we're the opposite. We are concentrated in a remote and austere environment, but we operate 24/7 with a no-fail requirement to keep our machinery and equipment going. That's enabled by our personnel. They operate in extreme weather conditions each day. They have no-fail operations and we operate across the land, air, sea, and the cyber domains. On any given day in those areas you see on the screen, we have between 6,000 and 10,000 individuals on the ground. I can't give you a brief without a military map, so to ensure I give some context here, if you look at the Chichester Hub on the bottom right, that was the first two mines we operated. That is known as one of the hubs

of the key mining operations for haematite. On the left, the Solomon mine, the largest single mine site, and also the Eliwana mine, both connected by power and rail. The Iron Bridge mine, between Chichester Hub and the Port, is our new magnetite mine. Power-dependent. It unlocks all bodies around the world that are able to take that ore body, process it and take it in a form to the markets, where it can be used. And then port operations in Port Hedland, which really focuses on our rail, our unloading, and our shipping operations. So, to give you an understanding of the equipment and the plant, we have about 800 pieces of the large mobile equipment. Of that, 350 of those are 270-tonne trucks, and those trucks - much like the Tonka truck you'll see when you're a kid - they are completely autonomous. They all are operated across the mine sites, they are able to refuel as they need to. What's important is that they operate about 23 hours a day. So, if you take your personal vehicle, for example - there's a good chance you drive that somewhere between 200 to 300 hours per year. Our mine trucks are operating about 7,500 hours per year on the site. What that means, and what you can imagine from that, is the incredible maintenance, both planned and unplanned activities, that go into operating an automated fleet of that size in one of the most austere and harsh environments on the planet.

We have another 450 major pieces of equipment up to and including our 600-tonne diggers, 400-tonne diggers, a completely autonomous drill fleet, which operates with our blast operations, and all of the standard graders and dozers, etcetera. Now, while that force is not about to be brought to bear as part of Australia's air power, if we do need to dig a massive tank ditch to prevent forces coming down from the north, I do think it's worth giving us a call.

On our rail operations, you can see there, we operate 760km of heavy-haul rail. All of the equipment I'm talking about is internal to our company. What that means, and much like our armed forces, is that we're not reliant on third parties for any of these major operations. Across our rail system, we have 70 loco motives and about 2,500 org cars. They're broken up into a rake, which is a full system which is loaded and moves down to the port. Any rake has got two locos at the front, two at the back, and about 240 or 250 rail cars, and 35,000 tonnes of iron ore on board. We need to move about 15 of those rakes from our

mine sites down to the port operations every day, on average. That also means we need to load all of those 15 rakes per day, and we do that by our major train operations and train loading facilities at each of the major mine sites. What we do have, and one of the innovations we're using right now, is that those mines you see in Chichester and the Western Hub are about 500m above sea level. Anyone familiar with Formula One will understand that they use regenerative braking, where they are building electrical power based on the braking they are using. We're under way with an infinity train, using regenerative braking, while it's loading, down to the elevation of the port, that generates enough energy to return the empty cars back up to the mine sites as well, with no need to refuel at any point along the system. I say this to give you an indication of the innovation and the concepts that we are trying to employ to make sure that we remain not just world-class but world-leading. Our port operations, we own eight cape-size vessels. So, a cape-size vessel, about 260,000 tonnes. They only move about 10% of our iron ore in total. But what is critical is that gives us both an understanding of the supply chain and also an understanding of all of the detailed costs that go within that supply chain. We operate the port in Port Hedland. That has five Cape-class berths. We operate ten tugs and we need to get 2-3 shipments out per day, every day, to ensure we fulfil our customer needs. To support those shipping operations, we have over 60km of heavy conveyor. That conveyor runs anywhere from 40-60km/h as well, and that moves about half a million tonnes per day, the 3km from where we unload our trains into the port operations. And most importantly for an Air Power Conference, we operate a total of five aerodromes across our sites. Four 8,000ft runways and one 6,500ft runway. Each of those aerodromes is full AGL day and night flying capabilities, at any given time, we can have two A320 or 737-sized aircraft on the ground. And we have both overwing and underwing refuelling capabilities across those sites. We have our standard operations of brown handling and terminal facilities, and we move anywhere between 1,000-2,000 people in and out of our sites every single day. That's covered across between 15 and 20 flights, depending on the site requirement.

This is all, naturally, integrated and brought together by the cyber domain.

The cyber domain has become absolutely critical to our operations and we run that through what is known as the Fortescue Hive based out of Perth. Very similar to integrated complex military operations and a forward-deployed force. The integrated operations centre, the Hive, is responsible for the ongoing operations across all of our domains. It hosts our planning operations and mine control teams, and it brings together the value chain of our port, rail and shipping operations as well. And, naturally, that cyber domain is then supported by a very, very heavy, complex, and highly efficient communications network that includes satellite communications and fixed plant across all of our sites and down in Perth as well. To support these activities, we have maintainers to make sure that plant and equipment is running as planned and up to the speed we need. Our mean time between failures are world-leading. What's important here is that while the motivator for a commercial company like Fortescue to maintain world-class operations and world-leading operations is different to a military force, the necessity for it to occur, the systems and effort that need to be in place to maintain those operations consistently for now over 20 years are very, very similar. Now, I have been the direct beneficiary on multiple deployments throughout the Middle East, where I was on the ground and I was subject to the ability of our combined air components to deliver battlefield effects, often within metres of my own position. I can tell you I don't believe there is a more important aspect of warfare than that ability to deliver a certain battlefield effect in support of those that are doing it tough in the remote, austere environments, and particularly in combat. Equally, I can't think of a more alarming position to be in than to be on the ground in these hostile environments without the ability to have that battlefield effect delivered at the time and place where it's needed the most.

I would love to stand in front of all of you right now and say that Fortescue has won it, we've got the trick, you can buy a certain piece of equipment, there's a certain system or a certain process that enables all of these operations in these remote and austere environments and keeps it at the forefront. I think, fittingly, following the panel we've just had, I can tell you without doubt and without question, the superpower behind a company like Fortescue and the performance of

a company like Fortescue, it sits in our people. And I'll talk a little bit now about the importance of making sure that we set ourselves up for success in regards to our people attraction, retention, and ongoing training, which is equally important obviously in an air environment and a broader military domain.

Over 20 years of operating in some of the harshest conditions in the world in our mining operations, the reality is there are times we have failed. We have, unfortunately, in the course of our business, we have lost employees over that time. What we have done, and the reason we have been able to consistently perform and outperform our peers, is we have focused consistently on ensuring that we attract and retain the best people. Given the importance of this centre of gravity, and the importance of providing an offering that attracts talent, we can't underestimate the importance of ensuring that our recruiting and our personnel strategies remain agile. Even through the event of COVID, we've had an excellent window into the difference and the changing nature of power between employers and employees, and in the instance of this environment, between service members and their needs. What we found, categorically, is that it's us - it's the company - that provides the conditions of service and the conditions for our employees that need to be agile, we need to listen to what it is they need to do their job, and we need to make sure we are in a position to provide that. The answer to everything is absolutely not to just pay people more. What we have found is that people care a lot. Our employees care about their working conditions and they care about whether they believe their company is there to support them. We have some of the best people in the world. Our next generation of our employees have grown up with the internet, they've grown up with technology, they're both familiar with it and they're comfortable with it. The challenge for us as a business is to ensure that we are leveraging those technologies so that we can ensure we remain at the front end of our capability. Every single leader in the room here today understands and has heard from the day we started our training that people and well-led people is the most important thing. Our business resilience, much like the resilience of a major military force, lives and dies by the resilience of our individuals and by our ability to lead those individuals and to provide that operating environment for them. We often like to

talk about the complex adaptive enemy. The reality is, we need to lead a complex, adaptive workforce. These individuals consistently find ways in some of the toughest environments because they're happy to do the job, because we provided an environment for them up on those sites, in those difficult conditions, where they believe they are valued and they believe they can contribute to the company.

This means at Fortescue we place a huge emphasis on being a values-led organisation. Every company I have been to in the world, you'll walk into those companies and see the values on the wall. It's unlikely in any conversation within that organisation that you're going to hear about them again. The truth is, we use our values as our core leadership tool. We ask all of our leaders on the ground to use the values when they make decisions and not to pick and choose which values they use in which particular situation. We have values such as: Stretch targets, courage, determination, innovation. And they sit equally alongside: Safety and family. The most important values we use in motivating that workforce to overcome the many, many problems you have when you're working in remote and austere environments. Mining has a history of listening to our operators. We have a history of listening to the people that have been on the ground and have seen all the problems and have fixed those problems. It's a very easy environment to work in. Because when you're looking for a solution to a problem, all you need to do is ask. It's upon the leadership of the company to make sure that we create that culture. Probably one of the most empowering and enabling assets of working in Fortescue is the willingness of the leaders to let you fail. It takes a long time to teach a group of individuals that failure is not the opposite of success, failure is the bricks and mortar and the key steps to getting to success. The way a leader reacts when a group fails to meet a target is incredibly important to the psycho-safety of the individuals who we wish to innovate, we wish to think, and we wish to go and solve our problems for us. It takes a long time, when you're dealing with a PhD in molecular chemistry, to convince that individual who has been perfect almost all of their life, "It's OK to fail. I don't need a 100% solution two years from now, but I need an 80% solution by 2pm this afternoon." When you can create an environment where

individuals are willing to sit around a table and talk to each other about how to achieve, we make those decisions and then we make the decisions right. When we get that wrong, we fail fast, we learn, and we move on. All of that is executed through the quality of the people. So, while there may be very, very different reasons and different motivations behind the individuals that we are trying to attract to come and work in our environment, the reality is the major aspects of capability, of efficiency, and of operating in a complex and remote environment like the Pilbara are very, very similar in many ways to the ability to project air power, and power of the remaining domains in a supported military operation. And I want to close now by talking about the impact of the energy transition on heavy industry. Much is said about the need and the value of an energy transition. You hear terms like low-carbon, green hydrogen, like energy security, and they're debated politically, in the media. Almost as if at some point one will be the winner over the other. The reality is, whether we believe in the energy transition or not, it's happening. Whether we believe we need to have energy independence in time, every single operation we conduct in a military sense is enabled completely by the ability to deliver electrons into the systems and the equipment that we use. That is always going to come from a source of energy. For a company like Fortescue today, we consume over 650 million litres of diesel. 4.1 petajoules of natural gas. As it grows, the requirement for that energy increases as we need to move ore further to get it processed and to the port. What we are doing today is much like Defence. When we procure a fleet of highly mobile trucks, for example, we don't procure those vehicles to operate for the next 2-3 years. Those vehicles and those fleets and the infrastructure are procured with a total operating life that leads to 10, 20, and 30 years from now. The same happens with our ships, when we're procuring a ship today we need to know that the power train and the drive train behind that ship is still going to be effective, or at least will be able to be modified in order to meet the demands of the energy transition. The reason this becomes really important is because what we're seeing across industry today is that new oil and gas and fossil fuel projects are having trouble being funded. While the specs and the models behind the projects might look great,

the major investment houses of the world are baulking at putting more and more money into the fossil fuel environments, and they are putting more and more money into the energy transition. What that means is major industrial organisations, like any military around the world, must begin now with a focus on looking at how they will put the right molecules and the right electrons into their systems over the next 30-40 years, and they must make sure that their procurement houses are working along the technology lines that will define an ability to adjust to that energy transition along the way.

The physical volume of a battery to power an 80-tonne Abrams tank would make it twice the size, which means it needs twice the armour, more power to operate, and it becomes unviable. There is no battery energy density in the world today that could pick a C-17 off the ground and fly it anywhere near the range that exists today. The reality is the aviation world, more than anybody, has got to find an effective way to decarbonise. Energy density becomes key. Batteries today are not capable of having the energy density that would be needed for large-scale lift flight, nor would it have the energy density for the high volumes of power needed in supersonic jet flight. There is a number of initiatives globally. It doesn't matter which university you turn to, the energy transition and how we best make use of the new energy systems is being studied. The question for an Air Power Conference is how much of that work is happening inside Defence and how much of that work is happening in industry that directly supports Defence and power trains for our systems? Investment in energy independence must be part of our future force planning, and a failure to do so could leave a brilliant fleet of aircraft and an equally brilliant force on the ground, unable to deploy those systems to have the battlefield effects that are so needed. As a major industrial miner, it would be very reasonable for a company like Fortescue to stand back and say, "This is a problem we're going to let somebody else solve first." We are an industrial company, we need to use energy, and we're going to let somebody else do it. If anybody has met our chairman, that's not how he rolls. He wants to lead the energy transition for a simple reason: We must demonstrate that it's possible, that the technology exists, and in an industry perspective, we must demonstrate it can be done

economically and commercially. We've invested well over \$2 billion in the initial parts of our energy transition and we have a fully costed plan to become a net-zero mining operation by 2030. That means we will remove all 630 million litres of diesel fuel, all of the gas, and all of the electrons that are not made through renewables today. This future-proofs capability and it ensures that we reduce our risks and our long-term operating costs across the business.

Fortescue is a large mining company that has now become a leading resources, energy and technology company. I would love to have said that we've done that and we've found the secret sauce, we have been able to replace all of our human beings with computers and systems. But the reality is our ability to continue to innovate, our ability to continue to be world-leading, not just world-class, rests with our people. The effort that we put into procuring our major capital systems MUST be matched by the effort we are putting in to managing a workforce, attracting a workforce, and ensuring that we are adaptable, that the workforce demands, because the key to our success - much like the key to future military success - is in the quality of the human beings we're able to attract and maintain to work with us. There's about four minutes left now. I think I'd like to give an opportunity, if there is any questions, I'd be happy to take them. Thank you. (APPLAUSE)

MICHAEL SLEEMAN: Thank you, Mr Smith, for your fascinating presentation. I note - and it's a bit of a theme throughout the conference - the conversation around people. I've got a question here that's at the top of the queue. In the section where you spoke about the values alongside safety and family, for the mining sector, is fly-in, fly-out operations - FIFO - a requirement or a lifestyle choice for your workers? And what can Defence learn from how you manage families balancing extended periods of time and extended separation?

CAMERON SMITH: Yeah, it's a good question. So, there's a lot of data that talks about the impacts of FIFO operations on your workforce, particularly some of the stresses that they create. The key learning we've got from FIFO operations is that some people really enjoy it, they're comfortable with it, and that's what they'd like

to do. And for others, it's incredibly difficult. So, the key for us, really, has been making sure that we have the ability to communicate with people, we have options across our business from the Hive in Perth, more permanent operations in somewhere like Hedland, to those who are happy to do their swing on a site and come back home to their family. Obviously, there's a large difference. During COVID, we had individuals from the eastern states who had to come to Western Australia and they remained in Western Australia for many months - five, six, up to eight months. That had a significant impact on the welfare of many of those individuals. So, that is a challenge that will exist very much in the major deployment space for military operations. The key for us has been having the conversations because it is always an interesting piece of feedback to understand that there's a certain number of individuals who really enjoy - that's the lifestyle choice that they want to make. The issue for us is being able to give them the option, if that's not a lifestyle choice they want to make, what other options do we have across our workforce? We do have a very large workforce, a global workforce now, we're operational in over 30 countries, particularly relating to the energy business, so we do have opportunities for individuals who don't find comfort around those FIFO operations.