

**ECONOMICS AND INDUSTRY
STANDING COMMITTEE**

**INQUIRY INTO SAFETY-RELATED MATTERS
RELATING TO FLNG PROJECTS IN AUSTRALIAN WATERS
OFF THE WESTERN AUSTRALIAN COAST**

**TRANSCRIPT OF EVIDENCE
TAKEN AT PERTH
WEDNESDAY, 12 NOVEMBER 2014**

SESSION TWO

Members

**Mr I.C. Blayney(Chair)
Mr F.M. Logan (Deputy Chair)
Mr P.C. Tinley
Mr J. Norberger
Mr R.S. Love**

Hearing commenced at 10.37 am

Mr ANDREW DAMIAN DOHERTY
General Manager, HSSE, Shell Australia, examined:

Mr IAN GROSE
Commercial Manager, Prelude, Shell Australia, examined:

Mr GERALD DIXON
HSSE Manager, Prelude, Shell Australia, examined:

The CHAIR: On behalf of the Economics and Industry Standing Committee, I would like to thank you for your appearance before us today. The purpose of this hearing is to assist the committee in gathering evidence for its inquiry into safety-related matters concerning FLNG projects in Australian waters off Western Australia. You have been provided with a copy of the committee's specific terms of reference. At this stage I would like to introduce myself and the other members of the committee present today. I am the Chair, Ian Blayney. Next to me is the Deputy Chair, Hon Fran Logan. There is also Jan Norberger and Shane Love. The Economics and Industry Standing Committee is a committee of the Legislative Assembly of the Parliament of Western Australia. This hearing is a formal procedure of the house and therefore commands the same respect given to proceedings in the house itself. Even though the committee is not asking witnesses to provide evidence on oath or affirmation, it is important that you understand that any deliberate misleading may be regarded as contempt of the Parliament. This is a public hearing and Hansard is making a transcript of the proceedings for the public record. If you refer to any documents during your evidence, it would assist Hansard if you would provide the full title for the record.

Before we proceed to the inquiry's specific questions we have for you today, I need to ask you the following: have you completed the "Details of Witness" form?

The Witnesses: Yes.

The CHAIR: Do you understand the notes at the bottom of the form about giving evidence to a parliamentary committee?

The Witnesses: Yes.

The CHAIR: Did you receive and read the information for witnesses briefing sheet provided with the "Details of Witness" form?

The Witnesses: Yes.

The CHAIR: Do you have any questions in relation to being a witness at today's hearing?

The Witnesses: No.

The CHAIR: We understand you want to go through a presentation, which we are happy about, but we do not want it to occupy the entire session, so if you can go through it as quickly as you can, that would be appreciated.

Mr Doherty: Mr Chairman, thank you. I will make a few opening remarks if I may and then move into the short presentation and keep it as brief as I can. My name is Damian Doherty. I am a chartered engineer by profession and have worked in Shell for over 20 years in a variety of operational and engineering roles before I recently joined Shell Australia as the general manager for

HSSE. With me today, as you are aware, are Ian Grose, the Prelude commercial manager, and Gerry Dixon, the Prelude project HSSE manager.

Firstly and most importantly I want to open with Shell's commitment to safety. Shell's priority is the protection of people and the environment. It is the guiding principle to everything that we do in all our operations all over the world. In my role as the general manager for HSSE for Shell Australia, I am responsible for ensuring and providing support to the organisation to deliver on those commitments. As you know, Shell has undertaken the Prelude floating LNG project and the fact that Prelude FLNG will be the first floating LNG facility installed in Australian waters represents a significant milestone of innovation in the LNG sector. Our first goal with Prelude FLNG is to deliver and operate the project safely. We know that the lives of our people rest on our commitment to personal and process safety. In each stage of the project, in design through construction and when the project begins to operate, safety has been our top priority and will remain so throughout the lifetime of the project. Safety has always been the primary focus with multiple formal safety assessments completed to ensure that the design and risk levels are as ALARP—as low as reasonably practicable. It must be noted that we have put multiple barriers in place to prevent incidents in the first place, but we are also prepared for recovery as part of being a responsible operator. In the presentation today I will focus on a few aspects of the submission—I am aware there has already been previous engagement on it—namely, safety in Shell; safety in FLNG design; development testing and modelling; safety in operations and maintenance; and an update on our progress against the Australian safety regime. Should you have any questions during the presentation, please feel free to ask and, indeed, following the presentation.

For Shell the protection of our people and the environment is a deeply-held principle and that is manifest in our goal zero aspiration—no harm to people, no harm to the environment, no leaks. That is underpinned by the two diagrammatic representations on the right-hand side, the 12 lifesaving rules. We are firmly convinced that mandating these in our business saves lives in our business—simple rules in road safety, personal safety and process safety. On the top left-hand side is the layout of our control framework applied and mandated as minimum requirements that must be implemented around the world for safety in our business.

Safety in design includes managing the layout of the facility. The principal features I want to reinforce here are the location of the living quarters at the aft of the facility, well away from the hydrocarbon processing areas; the location of the flare on the opposite side of the loading facility; and, most notably, the installation of safety gaps between the processing units to ensure that there is segregation maximised between those facilities.

The turret mooring system is a crucial safety feature of the facility. The turret mooring system ensures that we can fix and secure permanently the facility to the seabed through a combination of 16 chains that are fixed firmly into the seabed with piles that are of the order of 65 metres deep into the subsea surface. In addition, the turret enables the facility to swivel and weathervane, which improves its stability and ensures safe offloading.

The key point with the hull and storage is that the hull design has been based on decades of experience in locations like the North Sea with similar floating facilities. In addition we have ballasting control to stabilise the vessel and dual storage cells in the hull which minimise the sloshing effect of the liquid, all designed to ensure that the facility is as stable as possible.

Having completed the design, testing to ensure that the design was suitable and safe was an imperative part of the design process and, as you are aware from your visit to MARIN, the scale models were put through their paces with actual metocean conditions up to and including the one-in-10 000 year storm scenario to demonstrate and give us assurance that the combination of the loading and the facility are safe.

Safety in severe weather is the next slide, having provided and demonstrated the modelling and design process that demonstrates the capability of the facility to sustain severe weather conditions

that is supported during the operation phase with a series of operating controls for adverse weather policy. In the event that adverse weather encroaches on the facility, there are a series of graduated controls implemented by the offshore installation manager to ensure the safety of the people on board and of the facility. Throughout the phase of operations we are investing in infrastructure in Darwin to ensure that we have a maintenance supply base. Given the remote nature of the facility, we have to ensure that routine maintenance is supported well throughout the operational phase and we also provide services for logistics marine and aviation out of Broome and we provide from Perth technical support through a collaborative work environment. In addition, emergency response services are made available with infield support vessels supplied out of Broome and an all-weather dedicated search and rescue helicopter located in Broome. In Perth, to back up the emergency response services, we have a 24/7 emergency response management team that is equipped to support the offshore facility and engage with agencies onshore where required.

Finally, I refer to the status against the safety regulatory regime. We have engaged with NOPSEMA, the body that represents the implementing of the act in terms of an early engagement on the design case, which demonstrated as low as reasonably practicable risk management of the design phase. Subsequently we have submitted our application for the installation of the subsea part of the project. That was submitted in April of this year and recently accepted by NOPSEMA in September. Forthcoming works are still in progress and that will include our hook-up and commissioning phase, where there will be a further submission to NOPSEMA and beyond that start-up and operations. Mr Chairman, that concludes the opening remarks. Thank you for giving us the opportunity to refresh the submission. We are happy to take questions.

[10.50 am]

Mr J. NORBERGER: Thank you for the presentation; it was really good. In previous hearings the committee has heard concerns from unions representing workers in the offshore oil and gas industry and, in summary, some of those concerns relate to what is described as a “lower standard of safety and environmental protection” than existing technologies with uncertainties around cryogenic risk, evacuation capability and procedures and emergency infrastructure available for those evacuated from an FLNG facility. How would Shell allay unions’ concerns about the safety of FLNG workers?

Mr Doherty: It is important for us to stress here that the design process that Shell follows is a fundamental deeply-held process in terms of delivering safety in the base case for ourselves and anyone else. In regards to demonstrating safety in the design case for ALARP, we evaluate the major hazards and we present through the design case a demonstration that we have managed these risks to as low as reasonably practicable and we also provide through the multiple reviews and assessments a reassurance that indeed those things are being tested thoroughly as part of the process, and that would include many of the hazards you alluded to. I am happy to invite further comment from Ian.

Mr Grose: I will just add that as the operator we, of course, have a duty of care for any personnel working for us and that includes those out on the proposed FLNG facility when it becomes operational. As Damian described, we are going through a whole process with the regulator of assuring that we have a safe operation and we get our safety case approved. We equally need to make sure that all the employees working for us understand how the safety systems work, what their role is and how we work together to make it a safe operation, so we will engage with them as we go through. Already some of the operators that we have been recruiting have been sent to ACEPT facilities at Henderson. They are getting core FLNG training so that when they join us, they come up to the same level of understanding of the hazards and how to manage and then going on to Geaje and helping with pre-commissioning so they become intimately involved with the FLNG facility and how it works. We recognise that many people will have worries and concerns and

we have to make sure that we do our best to communicate what we are doing in the job to address those.

Mr Dixon: If I can just cover the emergency response, we have the actual infrastructure in place for our drilling activity at the moment. We have helicopters based out of Broome and as Damian alluded to, we have a SAR helicopter operational 24/7. That stands there ready to be called up should it be needed for any medivac from the drilling rig. We then have the fixed wing medicare facility that would pick up any casualty or medivac situation should it need to go to Perth or Darwin. We can use the local infrastructure for minor cases should we need it.

Mr J. NORBERGER: I will pick up on one point and give you an opportunity to clearly state your case. One of the summary points from the unions was obviously what they describe as a lower standard of safety and environmental protection than existing technology. This comes back to ALARP. The whole notion of ALARP as we heard from NOPSEMA is that it is subjective—it is as low as reasonably practicable in a particular situation. The unions have concerns that given the unique situation of FLNG, increasing safety to the equivalent standard on a fixed rig will mean that the cost to achieve the same level of safety on an FLNG vessel will be uneconomical or beyond reasonable. From having read the transcript that is what they were trying to say—that you will go to an ALARP level, but because you will get to a point at which it is unreasonable to make it any safer than what you possibly could, given the confines of an FLNG vessel, that it is not as safe as it would have been if traditional technology had been used. Is that view shared by Shell?

Mr Doherty: I will take a first-pass to answer the question and then my colleagues I am sure will chip in. The crucial part of any project, any delivery in Shell, is that we are satisfied and convinced that the ALARP is demonstrated for the lifetime of the project. That is a decision that we make at the outset. So evaluating those risks across the lifetime is part of that design case assessment at the concept and the design process. To deliver that is imperative; we would not proceed with a design that we are not satisfied would meet that criteria. That is the first point. The other point is that in demonstrating the ALARP process, there is a tight process of evaluating all the options that could be pursued to give us that assurance internally with review with our technical staff. Thirdly, the experience that we have had with floating facilities, oil and gas production facilities, elsewhere in the world gives us a deep understanding of the risks that are understood, including liquefied natural gas processing facilities. That combination is well understood within in the business and is being applied thoroughly in the business.

Mr Dixon: I just support the slide that was up earlier showing the layout of the asset. Again, that is a critical part of the risk profile and design and, again, the standards that are being used are engineering standards that are out there for the oil and gas industry. The air gaps are critical to part of that risk profile and demonstration and obviously the liquefaction unit, the LNG offloading, the flare again, they are all positioned furthest away from the accommodation. And if you take some older first-generation assets, the modules tend to be stacked up on one another. The FLNG gives the ability to lay the process facility out to give maximum safety profile for the workers on the asset for living and work practices.

Mr Grose: I will add to that and simply say that a lot of early design work was specifically focused on ensuring that the individual risk to workers on the facility would be equivalent to any other offshore operating system and that is what we achieved with the design that we did and that is the design we submitted as part of the design safety case to NOPSEMA. It came back with questions, which we answered. We are confident that we have indeed reached that ALARP in the design and it is now incumbent on us to make sure that we carry through with that in the installation and operation.

Mr F.M. LOGAN: The Shell submission indicates that when a cyclone is approaching, operations will be turned down and, if necessary, stopped to protect the personnel and facility. Cyclonic activity occurs regularly, yearly, in the north of Western Australia and the Northern Territory and

certain facilities shut down and are then de-manned. FPSO vessels delink from their turrets and stand offshore to ride the cyclone out. Prelude will do neither of those things. Can you explain to the committee what process Shell has in place to turn down and then stop production on the basis of an incoming cyclone? At what point do you do that?

Mr Doherty: There is as I mentioned an adverse weather policy and that policy will have controls which are documented disciplined controls to be acted on by the offshore installation manager who has the duty and responsibility to keep members of the community out there safe and the facility safe. That documented set of controls will guide the offshore installation manager very clearly in the actions that he needs to take progressively in advance of an impending adverse weather situation and also based on the escalation that that event may incur as it develops and as its path is predicted. That will be a documented procedure and it will guide the offshore installation manager in his actions. Ultimately, it will be a progressive turning down of the facility, a reduction of activities, bringing staff inside to the safe location of the accommodation, which is designed to withstand adverse weather scenarios and to ultimately stop production.

Mr Dixon: I totally agree with what Damian just laid out. It is well versed in processes and procedures. We have weather policies in place. Ultimately the OIM decides whether he wants to shut down the asset earlier, but it is all laid out within the adverse weather policy and the incoming cyclone should it be coming in that direction.

Mr F.M. LOGAN: On that basis, can you provide a copy of those documents so that the committee is aware of those procedures?

Mr Doherty: I am sure we can make those documents available on notice.

Mr Grose: I want to add one other design point in relation to your question. One of the fundamental design decisions made for the floating LNG design was to make it capable of withstanding a one-in-10 000 year weather event. The reason we went that way was that it is far safer to make things completely able to withstand the weather and safe for all to stay on board than it is to design something that has to pick up and leave or has to be de-manned and to have helicopters in encroaching bad weather trying to get people off. This is intrinsically a much safer solution by going the other way and making the FLNG facility itself absolutely a safe haven in such an event.

Mr F.M. LOGAN: On that basis, there were representatives from Shell here the other today listening to the presentation by Inpex, which also argued that its central processing facility was going to withstand a one-in-10 000 year cyclone, but Inpex indicated it would have to de-man when cyclonic activity reached its critical point. I am sure if I asked many of the other operators in the North West whether their facilities could withstand a one-in-10 000 year adverse weather event they would probably say the same thing. What makes your FLNG different to those of the other operators that allow staff to stay on board whereas others have a procedure to de-man? What is the critical safety element on the FLNG that make the FLNG safer than all other facilities that are out there?

Mr Doherty: I think we highlighted, Mr Logan, in the presentation the design premises that were put in place at the outset, the philosophy that staff would always remain on board, and the turret assembly, the hull and storage assembly which, as I alluded to, is designed to withstand those conditions. The testing and the modelling at the MARIN facility was also part of the principle of giving us absolute assurance that this facility will have the acceptable safety requirements that we insist on within Shell.

Mr F.M. LOGAN: I am sure, Damian, that the facility has been tested to that capacity. I know it has because we talked to MARIN as well. Other operators say exactly the same thing. In situations in which human beings are sheltering from cyclonic activity, the procedure of other facilities, which

are modelled exactly the same way as yours, is to de-man. What makes your facility safer than the facilities of other operators in the area of humans being sheltered from a cyclone?

Mr Grose: We cannot speak for other operators; we only know what we are doing at Shell as operator of our FLNG facility.

Mr F.M. LOGAN: That is true, Ian. But you have made a claim that it is the same as that of other operators, but their procedure involves de-manning the facility—yours does not. Of course, the facility is designed to withstand a one-in-10 000 year cyclone, but the difference is that your staff stay on board in an area that protects them. What makes that area safer than other facilities whose procedure is to de-man?

Mr Grose: The only answer we have is that we have designed it for that condition so that it is safe. It has been built up on years of experience that Shell has had with FPSOs in adverse regions, such as the Shetland Islands and the North Sea; so with that experience and all the work we have done, we are pretty confident that we have a design that will meet the design criteria.

Mr F.M. LOGAN: Can you provide, even via a later submission, evidence to the committee that supports why the area in which your staff will shelter in the event of a cyclone is significantly different from any other facility that operates in the world and in the North West?

Mr Doherty: As part of the expectation set out by the legislation and the act, which demands of us that we be able to demonstrate that any hazards and risks are being managed to ALARP, that is part of that submission in the HSE case to demonstrate that. That is being submitted, as I mentioned earlier, in a progressive manner working right through to the operation's phase where indeed the documentation that I mentioned regarding an adverse weather policy will be incorporated as part of the submission to demonstrate how we are managing risks. In the design HSE case and the earlier engagement, the testing and ensuring that indeed the facility accommodation will match the requirements and deliver a safe haven for people in cyclonic conditions has to be demonstrated. That is also part of the design case requirement. There are many places we have had to satisfy ourselves, not only the legislation, that indeed we can meet the requirements in a robust manner. That is the manner in which it is done, that is the manner in which we expect it to be laid out in our company and that expectation is laid out in areas like the control framework to which I alluded earlier.

Mr F.M. LOGAN: Damian, all we are asking is for that information to be provided to the committee in writing. We are not NOPSEMA; we are the Parliament of Western Australia. We are asking for that information to be provided in writing.

Mr Doherty: Could we take that on notice?

Mr F.M. LOGAN: It is not taken on notice. We are asking for it, so if you could provide it to us.

Mr J. NORBERGER: As a follow-up, are there any aspects of the design within FLNG that would more or less dictate that you need staff present at all times to maintain the safety and integrity of the facility? Despite the fact that it has been designed to allow staff to stay on board, if everyone was evacuated from the facility, would that place the facility in a position of compromise? Is that one of the reasons it was designed for staff to always be there? Do you need people on board to maintain the cryogenic systems? Is it not an option to de-man?

Mr Doherty: I am restating that the philosophy is to maintain people on board through those conditions.

Mr J. NORBERGER: I realise that, but was that predicated by the fact that somewhere along the line potentially engineers or designers decided that it had to be designed to keep people on board because, quite frankly, if everyone up and left, the place would fall apart.

Mr Doherty: The answer is no.

Mr Dixon: I will just add to Damian's position. As you know, we have designed this in accordance with all the safety assessments, shutdown and blowdown criteria with the aspect of people safety. If the platform OIM decides to abandon and evacuate the asset, he will make that decision on the basis that people's safety is paramount. The facility will blowdown naturally and staff will leave either by helicopters or by TEMPSC and the ISVs will be placed locally surrounding the facility to manage that evacuation and the de-manning of the asset. At no point is there any pressure on any individuals to stay on the asset.

[11.10 am]

Mr R.S. LOVE: Getting back to the first question about the role of unions in the development of the safety case, have you had any consultation with the relevant Australian union about the building of the safety case? Have you involved any of the skilled operators that you have already recruited, some of whom we met in Geoje? Are they also involved in working through some of the organisational/cultural aspects of the safety case?

Mr Doherty: Our engagements are widespread with many communities and stakeholders. We are and have been engaging with people in the development of the HSSE case, but I would like to invite Ian to share additional insights.

Mr Grose: We have had some engagement with unions over the past few years and no doubt we will have more in the future. We work with our operators principally around making sure that they are competent and have all the necessary training to do their work and that they go to Geoje to learn how the facility will work. I am not quite sure what you are getting at in terms of culture. We have an active program in our project about "Pride in Prelude". We are trying to make sure we get a great culture of working together as a community out of the FLNG facility. It is a new and innovative facility, and we are taking the opportunity to get everyone excited about it—and they certainly are! We are getting very good recruitment candidates coming through. We have about 100 staff at Geoje now and we will have 240 on the books by the time we are ready to operate, so quite a lot of recruitment is going on.

Mr Dixon: I will add a bit more about the operation's involvement in the early basis of design. Shell operates many offshore assets around the globe and it has engaged with dedicated operators to come in and be part of the design process through all aspects of the build and the design concepts going forward.

Mr R.S. LOVE: Specifically though you said you had some interaction with the unions. I think the one union covers most of the workers. I am not sure about the demarcation aspects of unionism, but they have expressed a concern that they were not directly involved with discussions with your organisation about the building of the safety case. Was that an active decision on the part of Shell or do you not see the unions as being an integral part of the discussion?

Mr Doherty: Recognising that right now we are still in the phase of construction and that there is much more development work to take place, there has, as Ian said already, been some engagement with unions and I am sure that that engagement will develop as the project develops.

Mr Grose: We are still in the construction phase. We would not normally consult third parties about our safety case. We work our safety up and submit it to the regulator. It is not something we necessarily discuss.

Mr R.S. LOVE: On the matter of working through with the regulator, you operate throughout the world. We had NOPSEMA in today and talked about that. How do you compare the operation of regulations in Australia and offshore WA with those in other jurisdictions around the world? Is it similar or are there distinct differences? What is your experience as an international player of the performance of our regulator?

Mr Dixon: My experience in the number of years that I have been working with Shell in the United Kingdom, New Zealand and Australia, so post-Piper Alpha we know the regulatory regime changed

considerably in the UK. The regulatory requirements, the Australian NOPSEMA OPGGS act is very similar to the United Kingdom and certainly to Norway and New Zealand as well. It is comparable and demands the stringent formal safety assessments to operate any facility offshore in commonwealth waters or state waters.

Mr J. NORBERGER: When the committee was at MARIN, at the Shell headquarters in the Netherlands, which we were very grateful that it was facilitated, there was a question—I think Gerry you were there at the time—raised about the manning of the medical facilities on *Prelude*—on the FLNG—and whether there would be a qualified medical officer or whether it would be a first aider. I think at the time it was not possible to give an answer. Part of the response was that it depended on what the regulations would say and, basically, the question was more or less taken on notice. I was just wondering whether there has been any update on that and whether we know the qualifications of the type of person who would be manning the medical facilities on the *Prelude*?

Mr Doherty: So now we anticipate on board the facility having paramedic capability combined with the medical facilities that have already being built into the accommodation. In addition is paramedic capability on the infield support vessels, and we already have paramedic capability alongside the medic-air fixed-wing flight. So those are the premises that will be implemented.

Mr F.M. LOGAN: Can I just follow up on that to confirm what you have just said, Andrew? You were talking about how the paramedic capability will not be on the facility but that it will be on the ship supporting the facility and the helicopter.

Mr Doherty: Both and all of the above.

Mr Grose: And the search and rescue helicopter as well.

Mr Dixon: We also have the facility through the medi-air service, to call up a doctor or that level to go out on the search and rescue helicopter so that way you actually take additional medical support out with you, so should a casualty or medivac have to come off the asset, you are not leaving the asset without any medical cover. Along with that, supervisors will be trained up to first-aid level as well through the training of the crew members.

The CHAIR: Did you do an assessment of the capability of medical facilities on the mainland in that area around the North West Shelf?

Mr Doherty: Our emergency response procedure kicks in a tiered process. If we are looking at ensuring that we have the capability to treat potentially injured people both on the facility itself, as I described, with paramedics and clinical facilities on board, and where escalation requires that they are medivaced from the facility to Broome, principally, then treatment at the local hospital in Broome, and where that is not possible, then escalation further afield to either Darwin or Perth. It is a medically-governed decision as to where those facilities can best treat the case, both the facilities and our own medical practitioners.

The CHAIR: My understanding is that all the flights from Broome to *Prelude* will have to stop and be refuelled. Is that right?

Mr Doherty: That is correct.

The CHAIR: So nobody makes a machine that has the capability of flying directly from Broome to *Prelude*?

Mr Dixon: If I can take that one, a helicopter could go straight out and back, and if we needed to put a dedicated helicopter on, obviously we would reduce the payload and we could fuel up accordingly. It is a balancing act of how many pax do we want to take, and to take some extra fuel and we will fly either via Djarindjin out to the asset, refuel on the asset and then come straight back. The operation basically works that way currently with *Noble Clyde Boudreaux*. So if the decision is to go out, and people can fly out this directly to the asset —

The CHAIR: So they can actually fly direct?

Mr Dixon: Yes, it is payload dependent.

The CHAIR: It is a trade off.

Mr Dixon: Yes.

Mr F.M. LOGAN: Damian and Gerry, Shell is a partner on the North West Shelf gas plant. What are the health provisions? For example, at the medical centre on the North West Shelf facility, what is the staffing level? Is it paramedic or is it nurse? It will not be a doctor, I know that, but what is it?

Mr Dixon: If I understand your question correctly it is: what capability does the Karratha gas plant have on board?

Mr F.M. LOGAN: Yes, that is right.

Mr Dixon: Normally on a day-to-day operation there is a nurse in a medical facility. That facility is quite small. They have an on-site ambulance and they can mobilise that ambulance to go to wherever the medivac casualty is. That person is then transported to the local hospital, subject to the hospital being capable of dealing with the situation. If not, they then call on the medic-air flight. The medi-air fixed-wing flight is actually based in Karratha, and many of the operators use that same medi-air flight. So again, as Damien alluded to, subject to the severity of their condition that individual would then be flown to either Perth or Darwin for the various types of increased medical care.

Mr F.M. LOGAN: Why then the difference between an FLNG offshore with a paramedic and a nurse onshore?

Mr Dixon: When I say “nurse”, I do not know what their qualifications are. They may be the same as the paramedic offshore but the time difference, obviously, as you know, is by vehicle to the hospital, but you still have the same distances and time to get to a tier 3 hospital, which would be Darwin or Perth, subject to the severity of the injury.

Mr F.M. LOGAN: Gerry, you heard the questions I raised the other day when you were here listening to discussions we had with Inpex and others. What are the procedures should there be a severe incident that involves trauma of a particular staff member? The big difference that we can see is that onshore there is an ambulance that takes them to the hospital in Karratha, but what happens offshore? What would Shell do on FLNG? Would it fly them straight to Broome? What procedures do you have in place to deal with the trauma the victim is suffering from, and what facilities do you know that Broome has to deal with that trauma?

Mr Doherty: I will just take a step back, if I may, to share experience from elsewhere in the world. In places like the Gulf of Mexico and the North Sea, having practices of a paramedic on board has been demonstrated to be a good practice for managing emergency response cases and that has been our experience and our history. That is the basis which guides our decision for remote operations. In the particular case of the *Prelude*, the medical facilities on board are such that there is the capability, in combination with the paramedics, to stabilise patients in such a way that they can then be appropriately medivaced to Broome and, as I said earlier, treated in the Broome Hospital facilities. In the event that that is not possible, then we are making provision for further transfer to either Darwin or the Perth hospitals.

Mr J. NORBERGER: The committee heard evidence last week that in other states such as South Australia emergency health infrastructure has been pre-positioned at various sites. So rather than transporting patients thousands of kilometres to hospital, in an event, more or less while the helicopter is going out to the facility, medical professionals or the required trauma team, if you like, is being pre-positioned at that infrastructure. As you know, the committee is looking also at government responsibility, federal or state, as this industry grows and as more and more people are

being positioned within this industry what government should be doing to provide relevant infrastructure. There will be several hundred people on that facility. The nearest port of call is Broome. Are you satisfied with the level of health infrastructure that is currently available in Broome? If you want a limit, how often do you then have to incur further hours of flights? You have already incurred hours of flights to reach the mainland, and then you have to incur further hours of flights to get to another hospital. Are you satisfied with the level of infrastructure or would you like to see it upgraded?

Mr Doherty: Again, it is important for me to stress that our focus and our priority is on prevention. That really is where the effort goes in, both in the design and in the subsequent operation phases. I mentioned earlier the importance of things like the lifesaving rules and control framework and making sure that we prevent injuries in the first place, but recognising that we need to be prepared in the event that unlikely event happens, then we are working all the time to ensure that we can deliver that provision in the way it is designed. That is our obligation. We have rolled out, and we have in place right now for the drilling facility that is engaged out there the emergency response procedure, which enables us to operate the way I have described, but then we supplement that with an emergency response team based here in Perth who can engage with authorities as and where necessary, and other agencies to ensure that we have a coordinated and collaborated support.

Mr Grose: I think it is a very good area that you are looking at in terms of what infrastructure might be needed in the longer term future. There are a dozen FPSOs operating offshore and a number of other platforms, facilities and drilling rigs and so forth. Clearly there will be increased offshore activity going forward, not just with Prelude but other projects as well. So it is something that government does need to be thinking about; that is, what the capability is to support that industry. It is not for us to be prescriptive about what we absolutely need, but we are happy to be engaged in discussions that look at that. For us, of course, the responsibility for looking after people's lives rests firmly with us as operator as we will do everything we can to manage that and get them to a place of safety and treatment as fast as we can. So that is appropriate for what is available. It is not really for us to say what should be available in Broome, because there are a lot of other factors involved about the level of care, can you attract the right calibre of medical people to be there, to live there, to operate the equipment.

Mr F.M. LOGAN: But it is within Shell's responsibility and capacity, as well as government's response to that, to be prepared and be aware of all the risk involved, particularly if it is multiple casualties. At the base of what we are talking about at the moment is an incident that might involve the trauma of one person, but if there are multiple casualties—I am not particularly picking on Shell, I am just suggesting any of those facilities out there, but you are before us—in that area of the Browse region the nearest landfall to deal with that would be Broome. Is Broome capable of dealing with a multiple casualty situation, which could occur? We do not need another inquiry after something occurs to ask why we did not get it right; that is the whole point of this inquiry.

Mr Doherty: I can only stress again clearly that our focus is on prevention and a multiple scenario and we are focusing on ensuring that we are preventing the likelihood of those events happening. What we are doing is making sure that the emergency response procedures we have in place are then looking at the scenarios, what we would anticipate, and making sure that we have provision for that, and that we can reliably secure the safe recovery and treatment of anyone who would be injured. That is the practice that is in place right now on the drilling rig.

Mr F.M. LOGAN: The issue of transferring the LNG at sea is obviously one of the critical areas of safety. It is being done with the rigid loading arm as opposed to the floating hose. What kind of weather conditions would make it too difficult to transfer LNG at sea? What specific skills will operators require for holding the tanker that is being loaded in position while the LNG is being transferred? At the end of the day, it is a docking procedure. Are there skills involved in bringing that tanker alongside, just as they would be, for example, at the Karratha facility?

[11.30 am]

Mr Doherty: If I may just start with the question about the loading arm. The loading arm technology, of course, is similar technology to any loading arm. The difference is the dynamic relationship between the facility and the offloading, and that has been designed and tested in actual fact with using liquid nitrogen to give us assurance that indeed that loading arm will operate safely. As far as the loading activities and the operational activities are concerned, like any other operational activities on board, we will always be ensuring that we have the right training and competent staff to engage in those activities as part of our program. Is there anything that you would like to add, Gerry?

Mr Dixon: Just again, coming back, I know we keep talking about the adverse weather policy, but the operation, again, works around strict weather criteria and the use of the ISVs to bring in the LNG tanker and then it is fixed, obviously, with the mooring lines to the facility. Obviously, if the weather conditions are adverse—wind, tide, sea state—then that LNG tanker will not come alongside the facility. Again, we have strict marine adverse weather policies for operation, and there is also the additional guide wire, which ensures that when the loading arms do go across to the manifold, which is an industry-proven technology, it will latch on to that loading point.

Mr F.M. LOGAN: The skills for the operators who are part of that whole process, I presume on board the vessel, will be the crew of the vessel, which is normal, and on board *Prelude* those people would have the same skills and capacities as somebody doing it at the Karratha plant.

Mr Dixon: The only person who would be going across from the facility and joining the LNG tanker would be the pilot.

Mr F.M. LOGAN: No, I am talking about on board *Prelude* while the loading is taking place, because obviously there are ships coming in; there are still people on *Prelude* who have to be in charge of the docking facility. I presume they would have the same skills and capabilities of those at Karratha.

Mr Grose: Perhaps I can just add that indeed there will be general service operators working as part of the crew on the FLNG facility and they multitask, but one of their tasks will indeed be that we safely moor the visiting product carrier alongside. The product carriers are brought in by the two ISV tugs. These tugs have been specially designed for this project—42 metres long with 100-tonne bollard-pull tractor drives, so they are very manoeuvrable. They come up against great big Yokohama fenders and we have all the mooring lines that have also been carefully designed using all the results of the MARIN basin testing that we did. That mooring system is then monitored continuously by computer to show whether any of the mooring lines are coming under stresses that they should not be. We are watching the wind and wave and all of the current criteria as well, and so we can determine if there is an issue arising. If something came up where we had not acted against that, then the loading arms themselves, of course, have been designed to have a certain wider operating envelope and if it went beyond that envelope, then the QCDC system has an ESD, emergency shutdown, system that immediately separates—15 seconds, completely shuts and no spillage of liquid, and the ship can break away and depart the berth safely. But that is obviously an emergency situation and in normal operation we have criteria, as Gerry said, about when a ship can come against the berth. In certain sea states we are not allowed to permit an approach to the berth. At the end of the day it is up to the OIM on board the FLNG facility, the pilot and the ship's master, and if all three of them cannot agree, it is not going to come in.

Mr F.M. LOGAN: It is safe to say that the skills of those people on board *Prelude* who are involved in the loading operation have the same skill set you would see in Karratha with the rigid loading arm on dry land?

Mr Grose: It is not much different in that, if you like, the FLNG facility is a bit like the jetty with the mooring deck. Because it weathervanes—we have the actual thrusters to push up into the

prevailing weather—we create a lee and it is actually somewhat more secure and safer than a fixed orientation berth, we think. But it is not much different a task in terms of loading; loading rates are the same—10 000 cubic metres an hour. That is normal practice for all LNG loading around the world.

The CHAIR: Have Shell done, or are you aware of anyone having done, an exercise to try to estimate the cost to them of having to deal with, in Western Australia, two separate government bodies—the state body and the federal body? We are the one state that has not given those powers that we hold over coastal waters over to NOPSEMA. Have you got any idea what you think that would cost you?

Mr Doherty: Could I have the question again to clarify exactly what —

The CHAIR: The powers that the Western Australian government has kept in state waters, so approvals and things like that, other states have given over to NOPSEMA, so they deal with only one authority, whereas in Western Australia sometimes you have to deal with two; you have to deal with federal and state. Have you or anyone, to your knowledge, done any work to estimate what that costs, having to deal with two? Because it is a complaint we get quite regularly. I am curious if anyone has actually tried to put a figure on what it costs.

Mr Doherty: I am not aware of any such analysis, in my knowledge. However, I think dealing with a single regulator is more efficient for us.

The CHAIR: But you cannot quantify it. You cannot give us a figure and say, “This will save us X number of dollars.”

Mr Doherty: I am not aware of that.

Mr Grose: I think we have made some representations around that through APPEA.

The CHAIR: Yes, I guess it was something that was more an industry body that could give us a figure, so we will chase them for that.

Mr F.M. LOGAN: You referred earlier to the search and rescue helicopter. Can you confirm that is based in Darwin?

Mr Doherty: Broome now.

Mr F.M. LOGAN: It is based in Broome?

Mr Dixon: It has been operational for nearly two months now.

Mr F.M. LOGAN: Is that a Shell-dedicated facility or is that an industry-shared capability?

Mr Dixon: It is Shell-dedicated currently. However, we are looking at other operators to come in and, obviously, share that facility.

Mr F.M. LOGAN: Because we heard from other industry partners they were looking at sharing the search and rescue helicopter. That would be the same one, I presume.

Mr Grose: We welcome wherever we can synergies between oil and gas operators and others in the region because it makes more sense.

Mr R.S. LOVE: Just on the extreme weather event scenarios and listening to you talking about the mooring and the decoupling, that would mean that there would be times when you would not be able to offload. Presumably your plant keeps running and it builds up to a point where if there is a prolonged period of poor weather, you would have to just sit there full for an amount of time. What risks are there in having a full vessel sitting there when you cannot offload safely for a couple of weeks or some such because there is a series of weather events? How does that risk —

Mr Doherty: Your observation around having a vessel reaching a tank top condition, if you like, is correct; that situation could occur. In that event, of course, production and operation stop.

The production facility is secured for that period and made safe, and that all forms part of the operational envelope, which is considered when we deliver the safety case for the operation.

Mr R.S. LOVE: It does not entail any particular risk sitting with a full vessel in particularly rough conditions?

Mr Doherty: No.

Mr Dixon: Again, if I can just give a bit of clarity: with forecasting, tankers and weather predictions, you then wind the production back to predict when you are going to be ready, rather than just going straight up to tank top, but again it is covered in our process operations safety envelope to operate.

Mr Grose: We have used a lot of the metocean studies to understand what the berth availability would be and what that would impact on production, and what we see is that we have got just as high availability of operations as an onshore plant. It might seem a bit strange at first but, in fact, when you look at sea states, cyclones do not come that often. I mean we do certainly get them regularly. Not all of them come exactly over you; sometimes they come near and go away. Because we do not de-man for an approaching cyclone, we can keep operating until such time as the adverse weather constraint kicks in. Now, of course, if that is such that we are approaching tank top and we cannot have the LNG tanker berth, it is a moot point. We will be slowing down or eventually shutting down anyway. All that I am saying is the overall availability on an annual basis and it still comes out very positively.

The CHAIR: I would like to thank you for your evidence before the committee today. A transcript of this hearing will be forwarded to you for correction of minor errors. Any such corrections must be made and the transcript returned within 10 days from the date of the letter attached to the transcript. If the transcript is not returned within this period, it will be deemed to be correct. New material cannot be added via these corrections and the sense of your evidence cannot be altered. Should you wish to provide additional information or elaborate on particular points, please include a supplementary submission for the committee's consideration when you return your corrected transcript of evidence. We might have further questions to send out to you, if that is all right.

Hearing concluded at 11.43 am
