ORAL HEARING

PROPOSED LIQUEFIED NATURAL GAS (LNG) REGASIFICATION TERMINAL LOCATED ON THE SOUTHERN SHORE OF THE SHANNON ESTUARY IN THE TOWNLANDS OF RALAPPANE AND KILCOLGAN LOWER, CO. KERRY

HEARD BEFORE THE INSPECTOR,

MR. ANDREW BOYLE

ON THURSDAY, 24ND JANUARY, 2008

AT THE BRANDON HOTEL, TRALEE, CO. KERRY - DAY 4

I hereby certify the following to be a true and accurate transcript of recordings of the evidence in the above-named action.

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APPEARANCES

KERRY COUNTY COUNCIL:	MR. T. SHEEHY
FOR THE APPLICANT (SHANNON LNG):	MR. HUGH O'NEILL SC MR. JARLATH FITZSIMONS BL
INSTRUCTED BY:	NICOLA DUNLEAVY SOLICITOR MATHESON ORMSBY PRENTICE
OBJECTORS:	MR. J. McELLIGOTT MS. GRIFFIN MR. NOEL LYNCH MS. JOAN MURPHY MR. DONNCHA FINUCANE MS. EILEEN O'CONNOR MR. E. McELLIGOTT MRS. LILY O'MAHONY MR. RAYMOND O'MAHONY MR. TIM MAHONY MR. THOMAS O'DONOVAN MR. MICHAEL FINUCANE MR. RICHARD O'SULLIVAN MR. DES BRANIGAN

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THE HEARING RESUMED AS FOLLOWS ON THURSDAY, 24TH JANUARY, 2008:

INSPECTOR: Good morning everybody, welcome to Day 4 of the Shannon LNG oral hearing. If you could take your seats please. 10:05

Now, yesterday we left off in the middle of the applicant's presentation on the health and safety issues, but before we continue with them this morning I have a request from Mr. Des Branigan, he has been asking me repeatedly if he can say a few words, so I am going to let him in first thing this morning. So, Mr. Branigan, if you would like the come up to the lectern here. 10:05 10:06

MR. DES BRANIGAN PRESENTED HIS SUBMISSION, AS FOLLOWS:

10:06

MR. BRANIGAN: Thank you, sir. Good morning everybody. I would ask for you to be tolerant with me, I am not particularly well this morning. I had a bad fall. But I will proceed to make it as brief as I possibly can. 10:06

For those of you who don't know, my name is Desmond Branigan and, if anything, I am a professional, or was a professional seafaring man. My organisation is

Marine Research & Associates and we are about 50 years in existence, nearly half a century. Our organisation is a corporate body and the Articles of Association define our functions as being marine research and public education of marine affairs. So, we have a good deal of expertise in this particular field. We have, always, people who willingly give their services to us when required. We have an archivist, a geologist, accounts, engineers, physicists, Master Mariners, coastal authorities, economists, statisticians etc., all of these people, like myself, act voluntarily. We have no income from anywhere. We are non-commercial, we are not answerable to anybody. We are only concerned with the competent development of the marine resources and the marine needs of Ireland. 10:07 10:08 10:08

Now, having said that I will very briefly read in this forward. The proposal by Shannon LNG to construct and operate a terminal to contain and process liquid natural gas in the estuary of the Shannon is the subject of a planning permission application to An Bord Pleanála. The question of the proposed terminal is to be the subject of an oral hearing, and that is, of course, what we are in now. The procedure to conduct and open informal discussion is in accordance with the statutory provisions of the planning legislation, which empowers the Board to conduct a procedure which permits all interested parties and concerned parties to make submissions containing their views. The provisions and 10:08 10:09

procedures are governed by the terms of the Planning Strategic Infrastructure Act, 2000. It was the Board's decision that the proposed development is a structure infrastructure and hence qualifies for direct application for planning permission the An Bord Pleanála. 10:09

There has been an attempt and, indeed, some of it is misinformed, to create great anxieties, that there is going to be desperate loss of energies, especially of oil. I am not going to go into the detail now, but many experts have had a long look at the situation and instead of listening to what not so well informed people had to say about the duration of the oil supplies, and availability of electricity, etc., we decided we will just find out for ourselves. 10:09 10:10

Now, it will be determined, how long that is, will be determined both by population and by the standard living of people. Now, in order to get a grip of this we consulted the United Nations, World Population Statistics, which are very, very informative, and we also gave a great deal of attention to the position of electricity, especially in the care of the ESB, and we came to the conclusion, having also considered the annual report issued by British Petroleum, who are international authorities on the question, and it is quite evident that existing supplies have by no means exhausted and even other supplies will be secured. 10:10 10:10

But, of course, hand in hand with that consumption is also going to increase, particularly as far as the Far East is concerned, so that they may cancel each other out. But it is our view that we are not talking about an oil difficulty of inside half a century. But in the meantime that doesn't mean we stand still. We have got to make every possible provision against that future when neither oil and, perhaps, any other source of energy is available. 10:11

In the past there has been, even in the press, efforts to create anxieties about energy availability, due to the expected loss of oil as a main source of energy. Even the decision of An Bord Pleanála to define the application for the proposed Shannon terminal having it allegedly designed to fast track the proposal. The Board quite correctly, when the allegation was brought to their attention, made it clear that they have no control over what appears in the press and their decision was in accordance with their terms. There is an attempt to suggest that there is a tremendous urgency. There is no tremendous urgency, except to take whatever steps that will give us what require in the long term. 10:12 10:12 10:12

Against that background we say there is no immediate concerns for the alleged shortage of energy, especially of oil. There is no need for the proposed Shannon LNG terminal, and that even now the State can purchase,

both for immediate consumption and strategic storage, as much natural gas as is needed for our present and future needs. There are bodies in the State, CER, the The Commissioner for Energy, and the ESB etc., who should have taken responsibility for this and so far haven't done so. But we will be calling upon the State and campaigning, indeed, to get national involvement in the control of this vital [inaudible], the need for energy. 10:13

We are particularly concerned that by 2020 -- and this came out the other day again, although we had done our work on it -- that in 2020 -- that's tomorrow for all practical purposes -- 65% of electricity needs will need natural gas. Now, you know, when we talk about a national need, we are talking about every house, we are talking about every factory, we are talking about hospitals, transport and all of the things that dictate and assist us in our modern lives. All those things could be placed in jeopardy and the very fact that it is so vitally necessary for us to get control of this is one of the main activating features of our organisation. 10:14

We say, by adopting a policy which will permit this, Ireland will, for the first time in the history of the State, be in a position to exercise total national control of the vital supply and to make provisions to ensure that even in future generations people can 10:14

control their own destiny. We must get control of that facility.

The purpose of the proposed terminal in the Shannon Estuary is to arrange the transit of LNG, to store it in giant storage tanks, which are extremely costly to construct, and later reconvert that liquid into a natural state. In the following submission it is intended to demonstrate that these functions can and, indeed, must be under State control as energy -- and this is extremely important -- as energy, in whatever form, is the life blood on which ever facet of national life is dependent. It is, in our view, the solemn and inescapable duty of the Government to exercise absolute control over every factor by which it is secured and administered, and we will be campaigning along those lines. 10:15 10:15 10:16

One such fundamental factor is risk control. Now, I have got no intention of talking about risks, we had a full day of that yesterday. And, indeed, the situation is that local people have shown every concern, both with regard to safety and other factors concerning their properties, and I don't intend. Before yesterday we had in fact dealt with the question but I don't intend to refer to that at any great length again. 10:16 10:16

But one point is risk control. With all the technical means by which this could be managed to lessen,

L-E-S-S-E-N, the consequences of danger, these cannot completely cover them. The construction of the ships which carry LNG and the construction of the structural regulations of the shore terminals may reduce but cannot remove the risk factor. 10:17

Now, there are many reasons to be anxious, some of which I have no intention of referring to on this platform. But one very strange one that is not even thought about, as far as I know, or I did see one reference to it. Only last year some dwelling or other structure in the Kerry area was struck by lightening and set alight. It doesn't take a great deal of imagination to see what would happen if the same thing were to happen, apart from any other dangers that there are, if it was to strike the facility plant or the land here. 10:17 10:18

Now, as a long established marine research body, incorporated by the company registration office, we are profoundly concerned to ensure, as an island nation, that the country secures the services by which the nation's needs are met. Not just in certain situations, but which are absolutely guaranteed for all time. In this policy we are extremely concerned to ensure that the most vital of all our needs, energy, is unfailingly available. While every other method of generating electricity must be cultivated we, as professionals, are mostly concern with the waters and 10:18 10:18

the wild. They are acutely aware of how important the generation of energy by wind and water power are. These, that is the wind and the water, are both permanent factors in our island life and are the sure source of renewable energy. 10:19

Finally, we consider electricity, not just its generation, as being the one matter which is common to all our lives and endeavours. This having been made abundantly clear in the most recent and excellently 10:20 produced document by Sustainable Energy Ireland. Those who have not read it will be well advised to do that.

On the report of the Joint Committee on energy by the Department, which was attended by all the State's major 10:20 bodies, it was stated that the Government has to take policy actions and the Joint Committee recommended that this action is taken as a matter of the greatest urgency. Now, that would seem to cut across what I was saying, that there is no urgency. There is no urgency 10:20 insofar as supplies are concerned, not even in the medium term. That's a long term factor. But there is an urgency for us to get control of the situation now and to establish the necessary authorities to do that. 10:21

In response to that statement, that as a matter of urgency there were to do this, the Government issued a Green Paper, which gave rise to the above statement. They issued a Green Paper seeking public reaction to

the proposals it made, and later issued a White Paper containing the policy. We have been party to and responded to each of those things.

Now, I have here a list of things which are stated by our friends in their EIS. I don't intend to read down through them all because they are absolutely correct in most respects, but time does not allow that we would examine them all. But while it says that these are, as presented, valid and largely accurate points, however, there are some reservations. 10:21 10:22

Firstly, in our opinion, the establishment of the proposed terminal on the Shannon is not the best or only method of sustainable supplies. Even if it was, it should not be granted planning permission in view of the grounds of safety and protection of the environment. That has been well dealt with up to now and I have no intention of referring to it further. 10:22 10:22

There is one historic thing. You can tell that I am not exactly a youngster, this is my 90th year. At the outbreak of the last war, or before the outbreak of the last war, I was party of a delegation to the then Minister in charge of supplies, Mr. Sean Lemass. They didn't act in time and, consequently, we found ourselves in a bad situation. Later Mr. Lemass gave me a copy of something he had said in a radio address to the nation. 10:23

> "We must never again allow our vital industries, and the health and comfort of our people, to be jeopardised through a lack of fuel supplies."

That's an extraordinary statement considering where we find ourselves today. 10:23

We say there was, is, could be a perfectly safe and economical -- and I would like Mr. MacIntyre, if he's still here, I would like very much to hear again the reasons they say that Kinsale -- and perhaps Mr. Power might do it -- the reasons that the Kinsale alternative that we suggested is not feasible. We don't argue, we don't condemn. Incidentally, I must say we never express opinions, we only deal in facts. We make no assumptions. We would like to know just exactly why it is being stated that Kinsale is not an option insofar as an alternative to the proposed facility in this area. 10:23 10:24

We did a great deal of work on the history of electricity supplies and graph after graph after graph we were able to establish what the situation was in the past and what the situation is now, and to establish that 37% of the electricity units currently are used for domestic purpose, 24% commercial and 39% industrial. Now, they are pretty meaningless statistics because they are so broad, but they are accurate nonetheless. As I have already said, the 10:25

Committee report that I have just referred to gives great detail of exactly how the electricity is being used.

There is just one other factor. We still say, and we have authority for this and one of the authorities is this LNG non-traditional concept for receiving and regasification in floating storages, etc., and the body that produced that said: 10:25 10:26

> "Public opinion in several countries is getting more and more opposed against onshore LNG terminals considering perceived safety risks and/or vital pollution of surroundings.
>
> Furthermore, governmental issues, like permits, Environmental Impact Studies etc., may significantly slow down the progress of new onshore LNG proposals." 10:26

And I think we are all guilty of that one, insofar as our presence here is concerned. But that is the considered opinion of a body that is not in favour of the traditional methods continuing. 10:26

As I said, we have conducted a national and international survey based on British Petroleum figures, not ours, and tried to establish how long we would be able to last in relation to depending on oil. 10:27 And by the simple method of getting an accurate picture of all the reserves that are known and dividing them by what was happening last year, and it is just a silly thing in the sense that what happened last year does

not necessarily mean much, but it gives an indication of how long we thought they would have. As I say, it is our opinion and we are not in anyway in any urgent situation, except the need to make provision for the future. 10:28

Now, I am almost finished, Chairman, and I am sorry if I have taken too long. Or Mr. Inspector I think they address you as, sir. I always address my superiors as sir. 10:28

There is this ongoing suggestion constantly repeated and reiterated, that LNG has been carried internationally for 40 years without a [inaudible]. As a subscriber to Lloyd's Publications, unfortunately in 10:28 the recent past they have discontinued a monthly journal of casualties at sea, but going through our records 2003 is the nearest we can get to it. In that year there were 5,000 serious casualties at sea, and that is by no means unusual. And every day, and by the 10:29 time I go home my papers will be there for every day of the week, showing casualties that have occurred elsewhere. But there is one, I think, only that I would like to refer to, because it is quite significant. It is an LNG tanker that had difficulties 10:29 of it own, its rudder crashed against it propellers or some peculiar thing, while at sea, with a full load. Those who drew up the report on it, they said this:

> "There are, of course, endless combinations of less favourable

> circumstances which could occur and for which the responsible operator must plan. There is some cases currently under detailed study by the Industry Working Group on Contingency Planning For Liquefied Gas Transportation."

10:30

That is perfectly true. There are endless combinations out there, and I was a tanker man for many years, and other ships as well. Nobody can predict the problem. But we know statistically that there is and has been and will continue to be casualties at sea, including -- 10:30 and let us be thankful that up to now the terrible possibilities of an explosion of an LNG tanker, or in a tank, it hasn't happened. We have to be thankful for that.

10:30

Now, there is one other bit in this which is not terribly important, and it is a bibliography which shows that we considered over 50 actual documents before we came to the conclusions that we did.

10:31

Let me conclude by saying that it is our organisation, in the national interest of this country, to urge the State to purchase our own tankers and make a deal with somebody like Norway, where we can be assured of a sustained supply. Norway not only has the reserves, 10:31 but are a very stable country by comparison with the Middle East, Algeria, Mexico and many other places. So, they are a stable and assured source. Our need is great and it can only be met if we can secure national

independence. Thank you, sir.

END OF SUBMISSION

INSPECTOR: Thank you Mr. Branigan. 10:32
Mr. Branigan, I wonder could you just stay there for a moment in case anybody has any questions. Are there any questions from the audience? The applicants? Okay, you can step down. Thank you very much for that. 10:32

MR. BRANIGAN: Thank you, Mr. Inspector.

INSPECTOR: Mr. Branigan has given us a written submission, which I think has circulated already, but it is now officially on the record and we are taking it in and you already 10:32 have your copy.

MR. O'NEILL: That's correct, sir, yes.

INSPECTOR: I now call on the applicants to resume their submission. I think it is likely that I am going to 10:32 have to interrupt you between speakers because the Health and Safety Authority want to make a presentation. But for the moment we will continue with your presentation.

MR. O'NEILL: We have no difficulty with 10:33 that, sir, and, of course, we are in our hands in any event. Our next speaker then is Mr. Lynch, who is going to speak on construction. He has a precis and, in accordance with

your suggestions, where appropriate he's going to ask that various passages be taken as read. Those are passages which are either covered by other witness or the subject matter of the EIS.

INSPECTOR: Thank you. 10:33

MR. EOGHAN LYNCH PRESENTED HIS SUBMISSION ON BEHALF OF THE APPLICANTS AS FOLLOWS:

MR. LYNCH: Good morning, my name is Eoghan Lynch. I hold a Degree in Civil Engineering from University College Cork and a Master of Science in Ocean Engineering From University College London. I am a Chartered Engineer and a Member of the Institution of Engineers of Ireland, the Institution of Structural Engineers and the Institute Of Marine Engineers. I am a Director of Arup Consulting Engineers, based in the Cork office. I have 26 years of experience in the project management and design of offshore and onshore oil and gas related projects, such as Marathon Ballycotton gas field, the installation of gas compression facilities on the existing Marathon platforms, the installation of a tanker mooring system at Whiddy Island for Bantry Terminals Limited, the development of a gas compressor station for Bord Gáis at Beattock in the south west of Scotland, the development of a number of gas pipelines for Bord Gáis, such as a 35km- 36 inch transmission pipeline around the western outskirts of Dublin and the

150km - 26 inch pipeline for Bord Gáis from Galway to the north west of Mayo. My role on the Shannon LNG project is Project Manager of the Arup team, which is responsibility for the preparation, on behalf of Shannon LNG, of the Environmental Impact Statement and planning application for the terminals. 10:34

I was responsible for overall preparation of Chapter 7 of the EIS, entitled "construction".

10:34

Mr. Inspector the following introduction has already been covered Mr. Bowdoin and Mr. Vinecombe. So if we move on to page 2. I will move over earthworks and site preparation also. This section here deals with site preparation, safe access, temporary site roads, 10:35 the fence, surface water, drainage, silt settlement ponds, the fact that approximately 1.1 million m^3 of overburdened soils and rock will be excavated. The fact that blasting may be required. Material excavated in the course of the earthworks and site preparation 10:35 phase will not be hauled off site.

If we turn to page 4, just going through it. Laydown areas will be established during the earthworks and site preparation phase. Then if we could move on to 10:35 water supply alternatives, because that is an item that Mr. Bowdoin referred to yesterday so I would like to read through that, if I may.

These fresh water requirements include, during the

construction phase: Mixing of concrete, the control of the dust, cleaning of equipment, hydrotest of piping and equipment, and hydrotest of the LNG tanks.

During operation there is a requirement for a fire water source 10:36

The largest water requirement is associated with the hydrostatic testing of the LNG tanks. After the tanks have been constructed the tanks will require a hydrotest, which will require a supply of approx. 110,000 m^3 of water over a period of about 1 week. If scheduling permits, the same water can be used to test another tank. Potable water is not essential for this, provided the water complies with certain chemical and solids limitations and has a limited residence time in the tank. 10:36 10:36

Potential water sources were investigated, include the existing municipal water supplies to Tarbert and Ballylongford, seawater, ground water from bored wells, importation of water by ship or road tanker and the existing stream within the site. 10:36

The existing water main approaching the site from Ballylongford is 50mm in diameter and forms part of the local Ballylongford Group Water Scheme. It is not of sufficient capacity to meet the water requirements for the hydrotest. Likewise, the Tarbert municipal system 10:37

is not adequate to provide the required volumes, either alone or in concert with the Ballylongford Group Water Scheme.

Sufficient volumes of seawater are available in the Shannon Estuary but the tanks would require a thorough high pressure wash down with large volumes of freshwater after the hydrotest to remove residual salt contamination. This would require working in the tank while the seawater is draining away and would, therefore, require personnel to work from baskets/cradles over the seawater as it is draining. This has safety implications for the personnel, in terms of working in confined spaces, and a procedure for their safe evacuation in an emergency would have to be prepared. Furthermore, the steel (9% nickel) of the inner tank would have to be primed with zinc paint prior to filling the seawater and the paint removed after the hydrotest. This would also have safety implications for the personnel. The use of stainless steel materials for the tank and its fittings would have to be avoided as much as possible (to prevent contact with seawater) and any essential stainless steel components would have to be installed after the hydrotest. Desalination of large volumes of seawater is considered to be uneconomical for the project. 10:37 10:37 10:37 10:38 10:38

The aquifer in the North Kerry area generally gives low yields and it was concluded that a continuos supply of

a large volume of water from bore holes on-site could not be guaranteed. This was confirmed by pumping tests that were carried out as part of the geotechnical site investigation works.

10:38

Shipping large volumes of suitable freshwater by sea was also investigated, but due to logistical difficulties, the volumes required and costs associated with such a method it was not pursued.

10:38

Importation of water by road tanker is not considered feasible as very large quantities would be required over short periods of time and a source for this large volume of water would have to be identified.

10:39

The stream within the site was identified as a possible water source. A manmade pond of sufficient capacity would be developed along the stream bed by constructing an embankment using material excavated on the site. The volume of the pond will be 150,000 - 160,000 m^3. 10:39 The ponds will initially be filled by the stream when there is good flow. This option has been chosen as the best option to source the hydrotest and construction water. This pond will also provide the source of fire water during the subsequent operations phase. 10:39 The filling of the pond will be planned and undertaken to ensure adequate residual flow in the stream and to prevent any adverse impacts. Extensive investigation of the hydrology and hydrogeology of the site has been

carried out to determine the amount of residual flow in the stream and also to demonstrate that the impoundment of the stream will have not adverse effect on the ecology of the site - in particular, the SAC and the NHA designated areas outside the north west boundary of the site. This is addressed in chapter 13 of the EIS and Ms. Eileen McCarthy and Mr. John Redding will describe this in detail in the ecology module. The maintenance of residual flow in the stream is only a temporary condition while the pond is being filled. Upon completion of filling the pond the stream overflows the embankment so that the flow in the stream downstream of the embankment is, as before, the same as the flow into the pond. 10:40 10:40

Moving on the construction of the pond and embankment. It will be constructed at the same time as the earthworks are being carried out. The construction of the embankment will begin with the diverting of the existing stream through on engineered culvert. This culvert will be located adjacent to the stream and will extend a sufficient distance upstream and downstream of the embankment to ensure that the construction works do not interfere with the stream. This culvert will also form part of the permanent embankment structure and, combined with control valve arrangements, will help to control the flow of the stream while the pond is being filled. Construction works on the embankment will not commence until the stream has been diverted into the 10:40 10:41

culvert. Next, the area under the footprint of the embankment will be excavated down to good bearing soil, with the excavated material being stockpiled for incorporation into the embankment.

10:41

The embankment will then be constructed using suitable material obtained from the on-site excavations.

As the embankment is being constructed the topsoil will be removed from the pond area and the pond bottom 10:41
profiled as required. Where necessary, clay or other suitable material obtained on-site will then be used to line the pond. The topsoil removed from the pond will be used for landscaping on-site. During the profiling of the pond base the run-off into the stream will be 10:42
minimised by diverting the stream into temporary flume pipes from upstream of the works to the engineered culvert under the embankment. It is envisaged that these pipes will be either concrete or steel, of a suitable size and number to maintain the flow through 10:42
the stream.

The road on top of the embankment will be constructed and the external surfaces of the embankment will then be prepared. And overflow spillway will be constructed 10:42
and control valves will be installed on the culvert under to the embankment.

The pond will be filled by closing the lower valve in

the culvert system sufficiently while still allowing the residual flow as outlined above. Once the required level is reached in the pond the culvert valve will be closed fully and the water will overtop the embankment at the spillway and flow down to the stream. 10:42

I would like, Mr. Inspector, just to move on, there is no need for me to refer to the next sections.

But if I could move to page 8. I have a description of the boundary fence, which comes up in some of the submissions later, which I would like to go through. 10:42

The purpose of the boundary fence is to secure the perimeter of the property of Shannon LNG. The configuration of the fencing at the site, that is both the boundary fence and inner site perimeter fence, was discussed with the Gardaí during the development stage of the site layout. The specification of the fence is a 2.4 metre high chain-link fence galvanised and PVC coated in evergreen, topped with three strands of barbed wire, giving an overall height of 2.9 metres. These are included in planning drawings No. 13 and 408, which were submitted with the planning application. 10:43 10:43

In general, it is planned to erect the fence just inside existing boundary hedgerows. However, at the boundary with the Coast Road the situation is different because it is proposed that the road would be upgraded

by Kerry County Council. This proposed upgrading will entail widening the road to 7m of carriageway plus 0.5m hard shoulder on both sides (thereby removing the existing hedgerow at the side of the road) with a 2m setback to a new boundary fence along the road frontage. The original site visual impact mitigation plan was to plant a row of trees inside the fence to provide some screening and to soften the impact of the fence. During the development of the design the immediate neighbours were consulted on the project and the planting of trees along the road frontage. Our initial proposal to plant trees continuously along the road was not preferred by the neighbours because it created a wall of trees and hindered views out to the estuary. The proposal was duly amended to show discontinuous tree planting and to generally tone down the planting at the roadside. A planned drawing of this was presented to the immediate neighbours and this was submitted for planning. 10:44 10:44 10:44

I propose, with your approval, Mr. Inspector, just to move over the next section, which is mitigation measures. These are all industry standards measure and are covered in the EIS. Which brings us to page 14 of the statement, which brings us up to the submissions and my responses. 10:44 10:45

The first one is a submission by the Development Applications Unit of the Department of the Environment,

Heritage and Local Government. The submission is that: "The responsible person, during both the construction and operational phase, must ensure that an appropriate waste management plan is in place".

10:45

Response: Shannon LNG will make it a specific requirement of the construction contract, as is normally the case on construction sites of this scale, that a Senior Manager of the construction company will be given this responsibility and Shannon LNG will have their own construction monitoring personnel on-site full-time to ensure that the waste management plan requires with requirements and that it is implemented properly.

10:45

10:45

The next submission is also by The Development Applications Unit of the Department of the Environment. "No blasting can be undertaken at the site without prior consultation with the Local Natural Parks and Wildlife Conversation Ranger".

10:46

Response: The construction method statement pertaining to any blasting which is required will be submitted to the National Parks and Wildlife prior to commencement of construction, allowing an appropriate time period for the NPWS to review and comment.

10:46

The next submissions are on the phasing of construction. These submissions, starting off with No.

L003 from Adam Kearney & Associates: In essence they are seeking a ten year construction window where tanks will be added as desired. People in the are who are unaware of this approach would grossly unacceptable to live adjacent to a construction site with all its 10:46
associated hazards and nuisances for such a lengthy period.

Submission L001 from Kathy Sinnott: In essence they are seeking a 10 year construction window where tanks 10:47
will be added as desired. People in the area who are unaware of this approach would consider it grossly unacceptable to live adjacent to a construction site with all its associated hazards and nuisances for such a lengthy period. 10:47

The final submission on that item is No. 24 from Mr. John Fox: The planned first phase should have a time limit and not be allowed to development piecemeal. Ten years is too long a period to ask the locals to 10:47
endure. Different phases should have separate time constraints and be stated clearly.

Response: It is proposed to construct one or two tanks in the first phase and the overall duration of this 10:47
first phase will be approximately four years, as described in section 7.2 of the EIS. In a later phase, or phases, additional tanks, giving an overall total of up to four, may be constructed within the ten year

planning period. Extra vaporisation equipment may also be installed in the later phase within the ten year planning period to increase the throughput capacity of the terminal to its ultimate level. The first phase will entail the site preparation and earthworks for the total area of the site which is the subject of this planning application, the construction of all site roads and drainage systems, the construction of the embankment and pond, the construction of the materials jetty, if required, the construction of the LNG jetty, the construction of all the mechanical, electrical, process, instrumentation, control and administration buildings, the installation of the equipment required for the initial throughput capacity and, finally, the completion of landscaping and planting for the whole site. In the first phase the tank platform will be completely excavated and prepared to accommodate four tanks, even though one or two tanks will be built in the first phase. All buildings are sized and will be built in the first phase to accommodate all the equipment which will be required for the ultimate throughput of the terminal. The ancillary projects, such as the road upgrade by Kerry County Council, the electricity transmission lines and the gas transmission pipeline will, of course, all be completed in the first phase. 10:48 10:48 10:48 10:48 10:49

The construction impacts that have been described in the EIS are based on the peak figures. For example,

the analysis of the construction traffic and the analysis of the noise associated with construction traffic and the analysis of the impact on air quality associated with the construction traffic is based on the figures for the peak construction workforce and the peak truck movements. These peak figures are determined from the overlapping of all the construction activities which I have described above. The construction traffic generated during the construction of tanks in a later phase will be less than these peak figures. Furthermore, as stated in section 9.5.1.3 of the EIS, the noise from the actual construction of tanks is generally significantly lower than the noise during the initial excavation works and the generation of dust during the construction of tanks at a later phase would also be significantly less because all the site preparation and earthworks will have been completed and internal site roads will be paved and clean. 10:49 10:49 10:49

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The next submissions are on the boundary fence. Starting off with L002 from Kathleen Kelly. She has a reference to "a prison like boundary treatment".

L003 from Adam Kearney & Associates: With regard to boundary treatment Shannon LNG propose to erect a 2.9m metal fence with barbed wire around the circumference of the 280 acre site. This includes several hundred metres of road frontage. There are numerous dwellings 10:50

to the south of the site who will have hedgerow replaced by a boundary more suited to a high security prison. Yet the company maintain that there will be no impact on property values. Many residents were offered photo perspectives of the tanks as can be seen from their front doors. Unfortunately, Shannon LNG failed to include the proposed boundary. One has to question why? Such boundary treatment proposals speak plenty about the inherent risks associated with the facility should there be an unauthorised incursion. From a purely planning perspective the boundary treatment and the tanks are completely incongruous with the receiving environment regardless of the zoning decisions made by ill informed County Councils. 10:50 10:51

L004 from Mary Kelly-Godley: Also they propose to erect a 10 foot high fence around the site with barbed wire on top, this would be an unnecessary blight on the landscape and the scenic rural area. 10:51

L043 from Raymond and Margaret O'Mahony: The 10 foot high fence across the road from my house will make the place look like a prison.

L049 from An Taisce, Kerry Association: The landscaping of the site boundary should have a beneficial effect, particularly if mature trees are planted in the most sensitive locations. It would be useful to have photomontages of the effect of this 10:51

planting on the views from the Coast Road.

L054 from Kilcolgan Residents Association: Section 24, paragraph 7 - we are afraid that children might cut themselves on the barbed wire fencing proposed around this site. Section 24, paragraph 13 - the EIS does not include the 2.9m barbed wire fencing in the photomontages and this is giving a misleading image of the full visual impact of the proposed development. 10:52

Response: Discussions have been held with some of the immediate neighbours on the Coast Road in this regard. The neighbours asked if the fence could be moved back from the edge of the road so that it would be less visible. Shannon LNG have assessed this and developed an alternative layout which shows the fence approximately 20 to 30 metres in from the centre of the existing road. Further to this Shannon LNG have indicated that a sod and stone ditch with native hedgerow could be reinstated at the edge of the road, 3m in from the edge of the hard shoulder. The ground slopes down into the site so the top of the boundary fence would be below the top of the hedgerow for a large extent of the road frontage. Further to this planting, which would grow no about 3m to 4m high, it can also be placed approximately 4m to 5m in front of the fence to screen the fence. The neighbours have also asked that low shrubbery rather than trees would be planted between the hedgerow and the fence. Shannon 10:52 10:52 10:53

LNG has confirmed to some of the neighbours, subject to An Bord Pleanála approval, that these various mitigation measures will be implemented. Mr. Thomas Burns will describe this proposal in his presentation later on landscape and visual. 10:53

INSPECTOR: Mr. Lynch, if I can just interrupt you there. Will you have or do you have a map showing these alterations?

MR. LYNCH: Yes. 10:53

INSPECTOR: That will be submitted at some stage.

MR. LYNCH: Yes. We would propose to do that with the landscape and visual module, Mr. Inspector. 10:53

Moving on to the section on recommended conditions from Kerry County Council. Mr. Inspector, we propose that we would take all of these as read, except for the condition which is just at the bottom of page 17. 10:54

Prior to the commencement of development all necessary public infrastructure works shall be completed to the satisfaction of the planning authority. In the EIS we have proposed that the main construction work would not 10:54 commence until road between Tarbert and the site is upgraded, but that the site preparation and earthworks would be carried out at the same time as the road upgrade work, because this activity is largely

self-contained within the site and would not entail significant construction traffic on the road. We would propose, Mr. Inspector, to discuss this aspect with Kerry County Council in terms of its timing and would be agreeable to that provided we can agree the timing and that it wouldn't delay the project. I propose not to go through all the other conditions and responses, because in our responses we are basically explaining how we would comply with the conditions of Kerry County Council. 10:54

So that would bring us on to bottom of page 21. That is the submissions on drainage.

The first submission there is from the Kerry Association of An Taisce: Section 16.2 states that surface water from paved areas etc. will go to the existing stream drainage ditch, presumably so that it can be collected in the pond created by the embankment. An alternative would be to collect water from non-process areas and use it for washing and toilet flushing in the plant buildings. It is also proposed any surplus would go to the estuary. This is not necessarily satisfactory for an industrial development, where surface waters could become contaminated, possibly with LNG. In recent times it has become more usual to have water disposed on-site after separation from any hazardous materials present. 10:55 10:55

Response: Kerry County Council have already expressed

a preference, which is referenced above, for all the surface water to be discharged to the estuary, which Shannon LNG agree to, as outlined in a previous response above. A Class 1 hydrocarbon interceptor will be incorporated in this outfall. It is not possible 10:56
for the surface water to become contaminated in LNG because the LNG spill containment system is kept separate from the surface water system and in any event LNG would simply vaporise if it came in contact with water. Discharging surface water run-off from an 10:56
industrial facility to a water course, estuary or harbour is satisfactory as long as the volume of water being discharged does not have an impact on the body of water it is discharging to. And given the size of the estuary we consider that this is not an issue. 10:56

The next submission is, again, from the Kerry Association of An Taisce: It is proposed to have separate effluent treatment facilities to service the Gate House, because of its distance from the wastewater 10:57
treatment plant. It is anticipated that the toilets will be used only infrequently and a biocycle unit with a discharging going to the estuary is proposed. The low volume of waste going to the plant could create problems by providing insufficient nutrients for the 10:57
bacteria which break down the waste. Has the applicant ensured that this is the best system? Or would other methods, such as a septic tank and percolation area or dry composting, be more suitable?

Response: The proposed biocycle wastewater treatment unit has the capacity to deal with infrequent flows. It will treat the wastewater to an effluent standard the 20mg/l BOD and 30mg/l SS. We believe this standard should be acceptable to the EPA and Kerry County Council under the IPPC licence procedure, especially given the volume of the receiving waters. 10:57

The next submission is from the Shannon Regional Fisheries Board: We have concerns about the discharge of polluting or deleterious matter that can be expected to arise during the construction phase. It is anticipated that precipitation on site will carry significant amounts of suspended solids in the surface waters leaving the site. It is essential that sufficient treatments and any other necessary measures are applied to the surface water discharge streams to prevent the discharge of polluting or deleterious matter. The discharges should comply with a licence to discharge granted by either the EPA or Kerry County Council. The Fisheries Board, as a statutory authority, must be consulted in relation to draft of a licence. Details relating to the discharge points shall be notified to the Board. At each discharge point adequate and safe provision must be provided to facilitate the taking of grab samples and any time by authorised persons from any statutory agency. We request that as a condition of planning the developer 10:57 10:58 10:58 10:58

should be required to consult and comply with the requirements of the Shannon Regional Fisheries Board so as to ensure the protection of fisheries and fisheries habitat in the Shannon Estuary.

10:59

Response: Treatment of surface water run-off has already been raise by Kerry County Council and is referenced above as one of their recommended conditions and, as described above, a response to this is: The construction environmental management plan will include this requirement with reference to the Construction Industry Research and Information Association UK guidance note on the control and management of water pollution on construction sites *'Control of the Water Pollution for Construction sites, guidance for consultant and contractors'*. Shannon LNG will issue the environmental management plan to the Fisheries Board in a timely manner and this will reference the discharge points and sampling facilities. Shannon LNG will consult with the Fisheries Board as a matter of course on these matters.

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The next and final submission is from the Kilcolgan Residents Association: Concern has also to be expressed on the effect of the additional surface water run-off from the site.

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Response: Kerry County Council has expressed a preference for all the surface water to be discharged

to the estuary. Which we agreed to as outlined in a previous response above. Treatment of the surface water is also raised by Kerry County Council and the Shannon Regional Fisheries Board and our response is as presented above. 11:00

So, in conclusion, Mr. Inspector, by virtue of the appointment by Shannon LNG of Senior Management personnel to control the environmental and community liaison aspects of the construction, such as a 11:00
community liaison officer and environmental protection officer, and the application of construction contracts with very strict health, safety and environmental criteria, the employment of reputable contractors with the appropriate experience and resources, the use of 11:00
conventional construction methods, the mitigation measures which are described in the EIS, the implementation of a comprehensive environmental management plan and the implementation of a comprehensive waste management plan I believe that the 11:01
construction of the terminal will not have a significant negative impact on the neighbours, the general community or the environment.

END OF SUBMISSION 11:01

INSPECTOR: Thank you Mr. Lynch. Our time is moving on this morning and I know that the Health and Safety Authority

are anxious to make a presentation because they are unavailable later.

Now, at this point I would just like to repeat the matters that I raised at the outset of the hearing, concerns that we have. I will just go through them again. What I asked was precisely what consents are required, and from which bodies, which have implications in relation to health and safety issues arising from the overall operation of the proposed development? I include in this the transshipment of LNG in the estuary, the unloading of LNG from the ship to the tanks on the proposed terminal site and the export of gas off the proposed site. 11:01 11:01

2. In terms of the Seveso Directive and associated regulations, does the establishment include the jetties and, if so, do the unloading ships form part of the establishment when they are moored at the jetties. 11:02

3. What is the precise remit of the Harbour and Port Authority in the area of health and safety? Does it include the jetties and any activities associated with the jetties, such as the unloading of LNG? 11:02

4. Are there any specific legislative provisions under any legislation relating to the control of LNG vessels docking and unloading at the site? If any, do these provisions relate to the health and safety issues

affecting the establishment and surrounding area?

5. In coming to its conclusion and advice to the Board -- and that's the advice that we had received to date -- did the HSA take into account the risk of a dangerous accident occurring in the estuary in proximity to the establishment and which could significantly impact on the establishment and surrounding area? 11:03

6. Did the HSA liaise with or have any communications with the harbour or Port Authority prior to submitting it advice to the Board? 11:03

7. The Harbour Port Authority has indicated that it is having an independent Quantitative Risk Assessment carried out for the estuary, we would like to know what the purpose of this QRA is and what decision making process is this designed to inform, should this QRA form any part of the consideration of the HSA in relation to the establishment? 11:03 11:04

Now, I think we have had answers or partial answers to some of these questions already and I don't know whether the HSA will address more of it in its presentation. So, I am going to call now on the Health and Safety Authority to make its presentation. 11:04

Mr. Conneely, if you can come up here.

MR. COUGHLAN: Chairman, could I make a

small observation at this point. You have asked questions of the Port Authority. I also would like to make a statement on behalf of the Port Authority, if you will permit, that may clarify some of the issues that you have just raised. 11:04

INSPECTOR: That's fine, but because Mr. Conneely is pressed for time.

MR. COUGHLAN: I accept.

INSPECTOR: Then I think I may come back. 11:04

MR. COUGHLAN: That is fine. I have one question for you: What do you mean by transshipment?

INSPECTOR: The bringing in of the LNG. 11:05

MR. COUGHLAN: Okay, I understand. That's fine.

INSPECTOR: Mr. Conneely, you want about five minutes to do preparations, is that right? 11:05

MR. CONNEELY: Just to get set up.

INSPECTOR: Okay, we will take a five minute break, but just bear in mind that it is just to allow him time to set things up. 11:05

SHORT ADJOURNMENT

THE HEARING RESUMED, AS FOLLOWS, AFTER A SHORT ADJOURNMENT

MR. PAT CONNEELY PRESENTED HIS SUBMISSION, AS FOLLOWS, ON BEHALF OF THE HEALTH AND SAFETY AUTHORITY

MR. CONNEELY: Good morning, I think I will have to go ahead without the presentation. We have circulated paper copies and I will talk through it. There is somebody on the way to try and fix it so hopefully we can pick it up during it. 11:17

Pat Conneely, Senior Inspector, Health and Safety Authority. We were requested to offer technical advice to the Board on this matter and we did so by letter on January 9th, 2008. The purpose of this presentation is to explain the role of the HSA in terms of Seveso and land use planning and, hopefully, in doing that to give some background to our advice and, also, to assist the Board in some of the questions that they have raised. 11:17 11:18

The duties of the Health and Safety Authority in relation to the Seveso II establishments are set out in regulations. Now, the regulations set out a lot of duties on operators but it also sets out duties on the Health and Safety Authority. Among those duties are the provision of land use planning advice for new establishments and around existing establishments. The 11:18

assessment of safety ports for Upper Tier Seveso establishments. The enforcement of safe legislation in all Seveso II establishments.

The Authority are required to report to the Commission on the preparation of External Emergency Plan for Upper Tier Seveso establishments. They are required to set the specified area for the provision of information to the public in the event of a major emergency. They are required to investigate accidents/incidents and to undertake an inspection programme. That can result in enforcement action up to and including prosecution and closure of an establishment. 11:18 11:19

Now, in relation to the land use planning role, this derives from Article 12 of the Seveso Directive, also called the Major Accident and Hazards Directive and sometimes referred as COMA Directive. So, all the same directive. Article 12 of that requires Member States to take account of the objectives of preventing major accidents in their land use planning policies through controls on the siting of new establishments, which are covered by this Directive, modifications to existing establishments covered by the Directive and new developments in the vicinity of establishments covered by the Directive. 11:19 11:19 11:19

Article 12 then goes on: Land use planning policies must take into account of the need in the long term to

maintain appropriate distances between establishments covered by the Directive and residential areas, buildings and areas of public use, major transport routes, as far as possible, recreational areas and areas of particular natural sensitivity. In the case of existing establishments, of the need for additional technical measures so as not to increase the risks to people. 11:20

The land use planning provisions, insofar as the HSA is concerned, are implemented under SI 74/2006, which are the Major Accidents and Hazard Regulations. Under those the HSA is required to provide technical advice to the planning authorities, on request, on the assessment of risks from an establishment. Advice is given either on a case by case basis or an a generic basis and from which the planning authorities can inform this decision. Advice is provided by the Health and Safety Authority to the planning authorities in consideration of the development of a new establishment, the modification of an existing establishment or where development is proposed in the vicinity of an existing establishment. 11:20 11:21

Broadly speaking, in terms of deriving our land use planning advice, it can be based on consequence or it can be based on risks. We might come back to that later. 11:21

Now, in terms of understanding our role, it is very important to understand that we deal with major accidents and sites covered by these regulations and major accidents. Therefore, the question will arise: What is a major accident? A major accident is defined in the regulations and it is an occurrence, such as "major emission, fire or explosion resulting from uncontrolled developments in the course of the operation of any establishment, leading to a serious danger to human health or the environment, whether immediate or delayed, inside or outside the establishment, and involving one or more dangerous substances". 11:21 11:21

I would emphasise two points on that, that it is relating to developments in the course of the operation of any establishment and it has to involve dangerous substances. Now, dangerous substances are listed in the regulations, there is an annex 1 and there is a generic list and a specific list and quantities relating to those substances. Therefore, a dangerous substance must be in one of those categories to be considered. 11:22 11:22

So, therefore, obviously, an important question then is: What is the establishment? Again, the establishment is defined in the regulations. It means the whole of the area under the control of the same person where dangerous substances are present at or 11:22

above the qualifying quantities in one or more installations, and for this purpose two or more areas that contain installations in the control of the same and separated only by a road, railway or inland waterway will be treated as one whole area.

In practice the establishment is generally comprised of the area within the facility boundary where the hazardous substances are processed and stored. This approach has been agreed with the EU Commission and representatives of under Member States.

In this instance, the establishment will consist of the area within the facility boundary, any pipelines within the facility boundary and the jetty associated exclusively with this facility.

I suppose it is important when we are deciding what's in, and what's out is also very important in knowing what our role is. Obviously, the HSA, along with all the State bodies, is empowered only to act within the statutory powers and cannot act ultra vires. So, the regulations to not cover the occurrence outside of an establishment of the transport of dangerous substances by road, rail, internal waterways, sea or air; intermediate temperate storage, the loading or unloading the dangerous substances at dock, wharves or marshalling yards. It also excludes the transport to and from another means of transport at docks, wharves

or marshalling yards and the transport of dangerous substances in pipelines and the pumping stations.

Now, I understand that the CER the Energy Regulator, is to take control of pipelines. But within establishments, as I pointed out already, it would fall within the Health and Safety Authority's remit. 11:24

Now, in practical terms certain other things are excluded as well. So, in giving its land use planning advice the HSA considers only the effects of credible major accidents in Ireland at the establishment. So, for example, routine emissions, (e.g. stack emissions, emissions to water) will be subject to licence under the IPPC licence regime determined by the EPA. 11:24 11:25

The advice of the HSA does not deal with site selection or the suitability of one site above another or one design above another. It deals with the specific request that comes in, it offers technical advice on that and it does not go beyond that. 11:25

Activities relating to site development construction are not considered in the context of provision of land use planning advice. These issues are covered by the general remit of safety legislation. 11:25

An issue that has been raised is around off-site initiators of major accidents. The way the HSA looks

at this is they look at could an event off-site initiate a major accident on-site. Could it act as a trigger. In determining whether that would be considered or be given creditability: It will not be considered if the event is of equal or lesser damage potential than the events for which the plant is being designed. So, for example, in this case if the plant is being designed to a certain standard we would rule out earthquake as an initiator for major accidents. 11:25

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If the event has a significantly lower frequency of occurrence than other events with similar uncertainties and could not result in worse consequence than those events. And the event cannot occur close enough to the plant to effect. Or, if the event is slow developing and there sufficient time to eliminate the source of the threat or to provide an adequate response. So, in those circumstances, external events would not be considered. 11:26

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To move on then to deal in a little more detail on the technical aspects of land use planning advice. When developing land use planning advice on the basis of consequence of major accidents the following endpoints are used. I know other speakers have dealt with this, in the case of heat we are looking at thermal radiation, which implies a particular intensity and exposure duration. In the case of explosion we would be looking at overpressure. If toxic material has been 11:26

released we look at toxic dose, which is a combination of the concentration and exposure period. So it is not just the concentration, we look at exposure time as well in looking at the endpoints for land use planning.

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This table, again, summarises some of the data on the effects of thermal radiation on both equipment and on people. The first three there are related to equipment and then the bottom three are related to people. Obviously, people are much more sensitive to thermal radiation than equipment. Not particularly relevant in this case, but in terms of overpressure and consequence we also look at that.

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Land use planning advice may also be generated on the basis of risk as opposed to just taking account of consequence. Risk is a combination of the consequence and the likelihood of it occurring. The risk endpoint that is used is the risk of death or of receiving a dangerous dose. I would say typically in QRA the risk of death seems to be the accepted. But the HSA currently use a risk of dangerous dose, as does the UK HSE. Dangerous dose is somewhat of a lesser endpoint, it is a lower threshold.

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In looking at risks approached the immediate question that arises is: What is a tolerable risk? If you are going to inform your technical advice on land use planning in terms of risk, what is a tolerable risk?

In order to try and form a view on that the Authority looked at what were everyday risks, what risks were people exposed to and accepted. This table comes from the second Kennedy Report, a UK publication on major hazards. The data there is looking at the number of 11:28
fatalities and the chances of an individual being killed based on various activities. Roughly speaking, if you look at the first two, motor vehicle accidents or accidents in the home, it suggest, roughly, the chances are 1 in 10,000 per year. So that's the risk 11:29
of those happening.

Taken from our own statistics for 2002, it shows workplace fatality. I have just highlighted there "construction", which is the highest, has the worst 11:29
fatality rate. If you see there, there are 20 workers killed in 2002 out of a working population of 183,200. That equates to a rate per million of 109.1 per million and that's equivalent to 1 in 10,000 again. So, in terms of how these things are expressed, that would be 11:29
a similar type of a risk.

In terms of land use planning advice, if we look at what's used elsewhere -- and the Authority did look elsewhere to see what benchmarks were being set -- in 11:29
the case of the HSE, if you look at the third line down there, benchmark for new plant developments, they suggested a risk of 1 in 100,000 per annum of dangerous dose. Under that then, at the bottom, for land use

planning, residential development unrestricted they suggest that a risk figure of 1 in a million per annum of dangerous dose is the figure that should be used.

The Netherlands has a very well developed risk based system and, again, I have highlighted the final entry under The Netherlands. They suggest that broadly acceptable public individual risk is 1 in a million per annum. I think, as well as that, above that they suggest maximum tolerable public individual risks for new developments, which is the second line there, at 1 in a million per annum. 11:30 11:30

In Australia the acceptable risk to the public in residential zones from hazardous injuries is set at 1 in a million per annum. So, you can see that there is pretty general agreement around, certainly new developments, that one in a million per annum is a benchmark figure to measured against. 11:30

In practical terms, in terms of existing establishments, the Authority has a three zone system. Again, I know some of these numbers are confusing. The inner zone works out to one by a ten to the minus five per year. That is roughly 10 chances in a million per year, the risk. The next one then works out to one chance in a million per year. The third zone works out to 0.3 chances in a million per year. So, they are just measures of risk. 11:31 11:31

Within those risk zones then the Authority have defined what they consider to be suitable developments. Again, this is looking at Best International Practice. This also would have an eye to recent publications, for example, the "Guidelines on Land Use Planning" that were published this year by the European Commission. As you can see, in the inner zone it is pretty restricted really. The inner zone often would just encompass the establishment itself. Outside of that we would permit workplace development, we would permit a certain amount of residential development. Out in zone 3 there would be no restrictions, except for sensitive developments. Outside of that generally there would be no restrictions at all, except for extremely large development or, again, very sensitive developments. They would consider that in looking and they would do that by look at societal risk. 11:31 11:32 11:32

That's the situation for existing sites. In effect, that middle zone starts at a 1 in 100,000 risk and works it way up to 1 in a million. So, around existing establishments it is considered tolerable to have residential development in that zone. 11:32

Now, a Board paper off the Health and Safety Authority deals specifically with the provision of land use planning advice, and this is a direct quote from it:

> "It is now necessary to demonstrate for new establishments that they do not present a risk of a dangerous dose greater than five by ten to the minus six to their current neighbours, or a risk of dangerous dose greater than one by a tenth minus six...

That is one in a million, one chance per million.

> "....to the nearest residential type property."

It then goes on to say:

> "This may be relaxed in respect of neighbours where the new development is the same and similar to existing neighbours. For example, new oil storage depot being set up in location already occupied by a tank farm." 11:33

So in setting that then the Authority is I think following best practice internationally of the one in a million and it is also setting a higher standard for new developments than for existing developments. 11:34

Now, that Board also goes on say:

> "The Authority will seek from the operators of proposed establishments a detailed consequence of risk assessment in order to help it formulate a response to a request for advice on a planning application." 11:34

So the normal process then in land use planning is that we would get a request from the Local Authority and we

give the advice to the Local Authority in whatever from is suitable depending on the type of development. If it's subsequently appealed to An Bord Pleanála then we would review that advice and we would advise An Bord Pleanála accordingly. 11:35

In this particular case the sequence of events I suppose is somewhat different. We were approached by Shannon LNG earlier last year to have meetings in relation to their application. Normally the Authority 11:35 does not get too involved with developers in terms of plans they have because we have a lot of other functions to do and land use planning is only one part of it and we don't want to get into a lot of discussion with people for projects that will never proceed. 11:35 Shannon LNG were quite persistent in looking for meetings with us. Having met them and having understood that this was likely to go through the fast track system, the strategic infrastructure under that legislation, and given that it was the first of its 11:36 type in the country we were happy to meet with them and their technical advisors prior to the application going in.

Now, the form of that would have been several long 11:36 meetings. Essentially at the first meeting the Authority would have explained its approach to the developers and what it would look for in a QRA and as we saw previously the board of the Authority says we

should look for those submissions for new developments. We would have explained to them what our criteria were, what we had done in previous cases, what are the issues we need to see addressed in there in order for us to accept a QRA. There were several meetings over the course up to the summer certainly. 11:36

Subsequent to that then we undertook a literature review of what was published in peer reviewed journals and so on. Subsequently the QRA was submitted to us and over a period a time we would have reviewed that QRA and by about mid-November I think we sent 14 written queries to Shannon LNG based on our assessment of the QRA -- actually I think it was 13, I think that's a mistake there. Subsequent to that then at a meeting in the middle of December Shannon LNG met us and presented a response to those queries. We had some long discussions around some issues and as a result of that then a further seven written queries went out to Shannon LNG for a response and those responses came in in late December and at the very beginning of January I think. 11:36 11:37 11:37

On the basis of that then on 9 January the Authority wrote to An Bord Pleanála with its technical advice and as a result of that is here today to discuss and explain its role. 11:37

The outcome of the process at that date was that we

accepted the risk contours from the QRA that were present to us. Our view was that the criteria that are set by the Board had been met and, therefore, the advice to An Bord Pleanála was our standard format of advice in a situation is that we do not advise against it. 11:38

That's a graphic there from the QRA report that is submitted and that shows the contours from the QRA showing the risk. As part of the questions that were raised with Shannon LNG a number of sensitivity checks were carried out to see how sensitive those contours were to the various assumptions that were made by Shannon LNG. There was some variation to the contours, but none that would have affected the advice that we would have given. In other words, the test that we had of the one in a million would still have been met even if one made some different assumptions in several different areas. Now, that may or may not be the final land use planning zones that the Authority will set, I think we would want to look at all the documents and looks at some of those sensitivities and it may well be that the land use planning zones that we set will not be quite the same as are represented there. 11:38 11:38 11:39

I suppose the question then arises 'what happens next, is that the end of it'. Certainly from the Health and Safety Authority's point of view it would not be the end of it. If this proposal proceeds we would have a 11:39

lot of involvement. This graphic is taken from the European guidelines on land use planning as I have referred to earlier and it shows the roles I suppose of the different agencies and the different activities in terms of Seveso establishments. We see land use planning there is one aspect, but within the development itself there is issues around safe technology and safe management and they are required to submit a safety report in relation to that and I will come to that maybe on another slide. 11:40

There is also a requirement then for emergency planning. Now, emergency planning is a function of the local competent authorities. The local competent authorities would typically be the fire authority of the Local Authority, the HSE and An Garda Síochána. So together they would develop external emergency plans. Now, there is a role for internal emergency plans and that is falls under the Health and Safety Authority. 11:40

There is also a requirement for provision of information to the public and I will deal with that as well maybe in a later slide. Again there is a role for inspections from the Health and Safety Authority and I will deal with that in a little bit more detail as well. 11:40

The safety report is a substantial requirement, it's probably the biggest requirement under the regulations

on these type of sites. In that safety report they must demonstrate, and 'demonstrate' is quite a powerful word, it is not just saying things, they have to convince us of various things. They must demonstrate that a major accident prevention policy and a safety management system are in place and that they are operating, that all credible major accident hazards have been identified, that all necessary measures are in place to prevent and mitigate against major accidents, that adequate safety and reliability have been incorporated into the design and construction of the establishment as well as the operation and maintenance. 11:41 11:41

I suppose I should say there it's very fortunate that there is a European standard on LNG plant and equipment and layout and so on and certainly Shannon LNG have committed to abide by that standard and they would be measured against that. There is a requirement that internal emergency plans are in place and that information has been supplied to the local authorities to provide for the external emergency plans. 11:41 11:41

If planning permission is granted the operator must supply a preconstruction safety report. Construction cannot commence until the HSA is satisfied with the contents of that report. Operation cannot commence until a preoperation safety report has been assessed to the satisfaction of the Health and Safety Authority. 11:42

The specified area is set by the Health and Safety Authority and it's the area within which members of the public must be informed of what to do in the event of an emergency so the specified area is an area in which the operator is required, for example, to provide information routinely as to if there is an emergency 'this is what you should do'. That's what the specified area covers. It's not the same as the external emergency planned area which I said is a matter for the local competent authorities. 11:42 11:43

The obligation to provide that information in the specified area is on the operator and they must inform persons or institutions of the safety measures and the correct behaviour to adopt in the event of an emergency. That information has to be reviewed every three years and it must be provided every five years. 11:43

I suppose finally then to finish off on that. There is an inspection and enforcement role as pointed out in that graphic as well. The Health and Safety Authority undertakes and in fact under the Directive and under the regulations we have to have a programme of inspection for these sites. Our current programme is that we would visit all of these sites at least annually and carry out a structured inspection on them. We take inspections and we take enforcement action as appropriate where we come across the need for it. The enforcement powers include notices which must be 11:43 11:43

complied with, we also have the power to initiate prosecution of the operator, of directors of the company where it is necessary. We have the power to shut down all or part of the facility where necessary. Thank you. That is my submission. 11:44

END OF SUBMISSION OF MR. CONNEELY

MR. CONNEELY WAS QUESTIONED AS FOLLOWS BY THE INSPECTOR

11:44

INSPECTOR: Thank you, Mr. Conneely. Before I open it to questions, the document I have been given is in black and white and I think it would be useful where colour is critical, particularly on the contour map, if you could make available to the board a colour edition. 11:44

MR. CONNEELY: Yes.

1 Q. **INSPECTOR:** Just to go back to the slide, major accident initiating events? 11:44

A. Yes.

2 Q. **INSPECTOR:** Some of that appears to relate to external events which might impinge on the site?

A. Yes. 11:45

3 Q. **INSPECTOR:** Does that include the possibility of a severe accident occurring to a ship, an LNG ship, which is tied up?

A. As it states earlier the establishment is included -- sorry, the establishment includes the jetty, I beg your pardon; therefore, operations on the jetty are included, firstly. When the ship is tied up at the jetty that is part of what we look at. There are various exclusions, we don't deal with transport and transport by sea and so on, but we would consider could an event at sea initiate a major accident on the establishment which is what we are interested in. Now, we do not consider terrorist activities, we are dealing with accidents, we do not consider issues like that. So our consideration is could there be an accident that could impinge on the establishment, not already be considered in what we have considered, is it more likely than some of the events we have considered and our view is that it's not. 11:45 11:46 11:46

4 Q. **INSPECTOR:** Sorry.

A. Our view is that such an event should not be included in our considerations.

5 Q. **INSPECTOR:** What, a terrorist event? 11:46

A. A terrorist event or an event involving a loss of containment in a ship outside of the jetty.

6 Q. **INSPECTOR:** When the ship is tied up to the jetty?

A. If the ship is tied up we will consider what is credible events at the jetty. Am I not being clear on this? 11:47

7 Q. **INSPECTOR:** Well, supposing there is a major rupture of one of the

tanks, possibly the scenario that was presented yesterday of a cascading effect, the possibility that the ship might shift its moorings, that the polypropylene lines tying it would melt and the ship would drift? 11:47

A. I said earlier as well we consider credible events. In all events we have to consider how likely they are. Some of those events, for example when the ship is moored we would consider that it's not credible that by accident it will be ruptured and lose half its 11:47 contents, that is not our view.

8 Q. **INSPECTOR:** Okay. Just turning to the contour map, which is in relation much to the same thing, just looking at the red zone around the jetty, that is marked in that way 11:49 am I right in thinking to reflect any danger?

A. Risk.

9 Q. **INSPECTOR:** Risk arising from the offloading of the gas and the passing back of the boil-off gas to the tanker? 11:49

A. Yes, it's related to the loading arms and unloading arms and the assumption that a leak could develop there and that could have consequences including fire and explosion, including fire and flash fire I suppose I should say more properly. 11:50

END OF QUESTIONING OF MR. CONNEELY BY THE INSPECTOR

INSPECTOR: Okay. I am going to throw

this open to the floor, but I would ask you to bear in mind that Mr. Conneely is only going to be available up to lunchtime so I would ask you to hone your questions and I would also ask you to also bear in mind that the Applicants themselves will probably have questions. Mr. McElligott?

MR. CONNELLY WAS THEN CROSS-EXAMINED, AS FOLLOWS, BY THE OBJECTORS

11:50

10 Q. **MR. McELLIGOTT:** Mr. Conneely, it is written in your guidelines in the setting of the specified area, the approach of the HSA, it is clearly that:

11:50

> "The Authority will review its approach in the light of new technical information, including accident experience concerning the effects of major accidents."

A. Yes.

11 Q. Now, yesterday we had Dr. Jerry Havens, a renowned LNG expert here, and he in the presence of Shannon LNG who have brought over their own LNG experts, they did not question him or very little because they could not challenge anything he said, Kerry County Council could not ask him any questions, the HSA could not ask him any questions and he raised several very serious issues. First of all, I would like to know are any of the issues that he raised which constitute new technical information, for example he showed a video

11:51

11:51

which has never before been shown in public, are you going to take any of that information into account?

A. Thank you. I suppose I should make clear that we did give our advice on January 9th and we indicated to yourselves and your group certainly that it wouldn't go out until January 11th and that was for administrative reasons that I won't go into again. You did submit quite an amount of material that we are still looking at. I have looked at the presentation and heard the presentation of Professor Havens and certainly we will consider what is in there. Having said that, I am familiar with the views of Professor Havens, I have read several of his articles, but I will certainly consider it. What I am saying is if we feel there is something in there that would cause us to change our advice then we would change our advice. We have no brief either for or against this development. We are trying to do it on a fairly scientific basis so if there is information available that would cause us to change our advice then we would change our advice. 11:52 11:52 11:52 11:52

Can I just go back and answer a couple of the other questions that you did raise. The guidelines on specified area, again not to confuse things. The specified area is this area in which the public would have to be informed about what to do if there was an accident on the site, okay, so it's about provision of information. It hasn't been set yet, that is something that still has to be set and probably would not be set 11:52

for some time. You said I could not ask Professor Havens any questions. Of course I didn't feel the need to ask him any questions, just to make that clear as well. I am very familiar with what he said, I have read several of his articles so I know his views on issues.

12 Q. Because he quoted the Sandia Report and he stated that it was a credible event, a credible possibility to have a breach of a half tank of an LNG ship and you are saying that you are not an LNG expert? 11:53

A. I am saying at the jetty ...(INTERJECTION)

MR. O'NEILL: Sorry, it's only fair that if a question is put it is accurate. What Dr. Havens was very, very clear to say that he no involvement and no expertise in risk assessment, he did not deal with issues as to credible events or not, Sir. 11:54

A. Just to make it clear in any case that I was suggesting that at the jetty I did not think that was a credible event. 11:54

13 Q. **MR. McELLIGOTT:** What led you to think it was not a credible event, did you get other LNG expert advice?

A. The advice is on the design of those tankers that a certain amount of energy would be required to breach the double hull and that energy would not be available at a tanker that's at berth at a jetty. There are arguments certainly about when it's out and it's travelling at speed and it has the potential maybe to 11:54

meet other objects and so on, but at the jetty we would not considered that not to be a credible event.

14 Q. What about an LNG spill on water?

A. Again looking at the type of operations that could occur at the jetty, a spill is a credible event, but the systems in place there would limit that spill. Certainly that is considered in the QRA and we think that's correct. 11:55

15 Q. Do you remember how much of a leak of LNG was in that video yesterday that caused that massive explosion? 11:55

A. No, I don't recall the exact figure.

16 Q. It was very low?

A. I am sure I have it in my notes and I can follow up on it, but, no, I don't have it to hand.

17 Q. You also say that your advice can be both consequence based as well as risk based, why do you not take the consequences into consideration also, he said the consequences are so serious that we should in this case, because LNG is so specific, why do we not take some of the consequences into account and not just on probabilities? 11:55 11:56

A. I suppose it's an argument about if events are so unlikely how far should you go to consider them. That's why the risk argument comes in there. There are events that are so unlikely, do you say no development can take place or you cannot put those types of developments anywhere when the risks are so low. The fact that there is a European standard, for example, on these type of sites suggest that they are considered 11:56

not to be intolerable, they are not banned, nobody says you cannot build them. You have to weigh up the risk, that's the nature of how these assessments are done.

18 Q. Okay. What about the probability of an accident happening on the estuary, how do you know that some of those events are not so credible if you don't measure the probability of them happening? 11:57

A. Are you referring to something out on the estuary?

19 Q. Of a ship moving in towards the jetty, it is still a moving ship, it is not moored, it is just about to move? 11:57

A. Again from various reports out there they suggest a certain speed is required. Again we would have considered this only in terms of could such an event initiate a major accident on the establishment, that would have been our only consideration. In looking at that we looked at a publication called the Purple book, which is Dutch book which deals with QRA and various probabilities, they do suggest a methodology there about looking at the likelihood of collisions and things like that for ships in ports. We did do a calculation on that that suggests if there were 30,000 movements it would be something that could be credible. It would have to be greater than that number of movements and given that the number of movements are very small on the estuary at that stage we decided we would not look any further at that. 11:57 11:57 11:58

20 Q. Who is going to be responsible so for a QRA of marine risk in general if it's not the HSA outside of the

establishment?

A. I would only answer for the HSA. The HSA's remit is very clear, it's to do with the establishment.

21 Q. It's for the health and safety of Irish people so if there is a risk somewhere else, if there is a credible risk of an accident are you not supposed to -- if you have been warned of a danger or somebody is adverting you to the possibility of an accident? 11:58

A. Other than health and safety of people at work which other legislation covers, we are dealing in terms of land use planning with the Seveso regulations and they are quite clear in what we deal with and we do not go outside that and I explained in my presentation we do not have powers to go outside of that. 11:59

22 Q. The health and safety of people at work so people working on an LNG ship coming in to port wouldn't they be under your powers? 11:59

A. They would be, yes, they could be.

23 Q. So the health and safety of the workers on the LNG ships, should you not take that into consideration as well or is that different? 11:59

A. We do, all persons on shipping at work in Ireland are under consideration.

24 Q. But that won't come into land use planning?

A. No, it won't. 11:59

25 Q. Do you not see a problem with the way it is broken down into different statutory bodies?

A. It's the way it is. We have a lot to deal with, we deal with what's in front of us and we don't go beyond

that.

26 Q. Okay. So the serious issues raised by Dr. Havens yesterday, you are somehow able to say because your responsibility is to a certain point that you can ignore what he just raised yesterday, I find that really a bit strange don't you think? 12:00

A. We can only do what we are entitled to do and if we went beyond it I am sure people would be pretty quick in telling us we are not entitled to go beyond that. Insofar as it affected our advice to the establishment I am certainly interested in what you said. As I said we have made notes of his presentation yesterday and we are still looking at documentation that your group have submitted so until that is completed we cannot say we have finalised our advice. 12:00 12:00

27 Q. Would you not consider also that the advice you are giving to An Bord Pleanála is only very specific for land use planning advice, but it does not constitute overall safety advice of the whole project?

A. I think that's a matter for the Board. I have explained very clearly what our remit is and where it applies. 12:00

28 Q. Do you not think that there are safety issues that have been raised that do not concern the HSA but they are safety issues that you will not be dealing with? 12:01

A. As I said those matters you are raising are a matter for the Board.

MR. McELLIGOTT: Okay. I just want to point out to the Inspector that

I think the HSA is not dealing with all of the safety issues in the siting of this terminal, that they are just giving a view on a very narrow land use planning criteria solely risk based analysis, not consequence based analysis as put forward by Jerry Havens yesterday so I am asking the Board to take that on board in its decision. The HSA might be able to say that they have no problems with the land use planning criteria which is just specific to its remit, but it is very much obvious that it is not giving an overall safety view of the whole project, thank you. 12:01 12:02

INSPECTOR: Does that conclude what you want to say,

Mr. McElligott?

MR. McELLIGOTT: Yes. 12:02

29 Q. **MR. ROBINSON:** David Robinson from Milford Haven. We have the same type of problem in Milford Haven. My question is will a QRA, a Quantitative Risk Assessment, for a spill of LNG on water from a 265,000 cubic metre LNG ship consider the spill from one tank, half the tank or the full tank and its consequences be needed for the Local Authority to write an emergency plan for on site and off site personnel? Will the Local Authority have to see the consequences from that spill of half of one tank before it can write the emergency plan? 12:02 12:03

A. I don't want to speak on behalf of the Local Authority either, I am sure that they can answer for themselves. I would only say that in terms of the Seveso

regulations that the external emergency plan requirement relates to the establishment and it's a function of the local competent authorities. There may be other bodies with responsibility for spills in the estuary, I presume there are, but I am not going to speak for them either so in terms of my function I can't really answer that one for you. 12:03

30 Q. I mention this because in Milford Haven the HSE have done what you are doing on land and the job on the water has been given to Milford Haven Port Authority to do the risk assessment. They have done a risk assessment for the guillotine cut of one hard arm that takes the LNG from a ship to shore, that's where the grey area is between the two. Now, they have not done a full independent risk assessment for Milford Haven for a spill of one half of one tank so our Pembrokeshire County Council are trying to write an emergency plan without knowing the consequences of what that spill might entail and as I mentioned the other day we have a lifeboat 900 metres from the ship and we know that if there is a 12 metre hole in one tank the impact range is 1.9 kilometres. There is something wrong somewhere in our case, I am not saying it's wrong here, but I am just warning everybody that you must be careful. There is a grey area somewhere. 12:03 12:04 12:04 12:05

A. Okay. The only response I would make to that is that again local competent authorities have to do these emergency plans, it's the matter for them, but I do think they take into consideration, our observations of

it is that they do take into consideration lots of events even fairly unlikely ones, that has been our experience.

31 Q. Would you take into account that the Sandia Report says that a spill of one half of one tank is a credible spill? 12:05

A. I have seen various reports. I saw one from DNV as well suggesting that it wasn't credible and suggesting a smaller one would be credible so there is a number out there. 12:06

32 Q. Sorry did you say it was incredible or credible?

A. DNV suggested that it wasn't credible.

33 Q. Incredible?

A. Well, not credible, yes. Not credible in terms of accidental... 12:06

34 Q. Just to clarify. DNV say it is incredible and Sandia say it is credible so there is disagreement?

A. Yes.

INSPECTOR: Ms. Griffin.

35 Q. **MS. GRIFFIN:** Hi, Catriona Griffin. I am just wondering, the contour lines, the red is obviously the most dangerous, why is there only one red contour line around the tanks when there is actually going to be four tanks? 12:06

A. I am sure the ERM can answer for that, but there is a sump there, 400 metres cubed, that will take most of the leaks. The most likely leaks, if you like, that would occur will roll into that location and that's why the highest risk is there. The risk of failure of the 12:06

tanks is extremely low and that's reflected in that QRA.

36 Q. Another question: You mention that if the tanker is moored at the jetty it is under your remit, have you looked at any accidents like the tanker having an accident while it is there, that it would break free from its moorings and pull away from the pier, do you think that's credible? 12:07

A. I am sure it is possible, but would it cause a major accident at that location then. Sorry, just to be clear, if it pulled away while it was unloading there are safety features there that would stop the flow of LNG within a very short period, that's part of the design of the system so if it did happen I do not think it would be any worse than what's included in the QRA. 12:07 12:08

37 Q. It is a credible incident because it actually happened in Savannah in 2006 and the entire plant had to be evacuated for 36 hours while it was under investigation so who is going to look at that?

A. I suppose did it cause a major accident? If you want to give me details of that I will certainly take a look at it, I doesn't come immediately to my mind, but I will certainly take a look at that. 12:08

38 Q. **MR. McELLIGOTT:** I just want to be very clear. If Sandia says that there is a credible event or a credible possibility of an accident and even Shannon LNG accept that Sandia is one of *the* reports how can you say it's not credible whatever Sandia says is credible? 12:09

A. I don't have the report right in front of me, but I certainly do recall looking through it. I think one of the issues was what was the most likely type of event if it did occur and they were talking about distances of effect from about 500 metres based on that. Even if one were to go with the Sandia it could not have an impact on the establishment and on that basis we would not pursue it any further.

39 Q. **MS. GRIFFIN:** Mr. Conneely, the definition of accident in the Oxford English dictionary is an unforeseen event? 12:09

A. It's very clear in terms of the regulations what are major accidents and there are particular regulations governing these sites, they impose additional duties on them so it's quite specific in what it is dealing with. 12:10

MS. GRIFFIN: I have a serious problem with it.

40 Q. **MR. McELLIGOTT:** How can you account for human error, how do you calculate the probability of human error? 12:10

A. Well, in most QRAs they allow a range of figures for it.

41 Q. I don't know mean in the calculation, human error itself?

A. We try and design systems to have as little human input as possible usually. I don't know if I want to answer on the whole details of the QRA, I think human error is explicitly dealt with in the QRA as well in terms of the inventories they use and the likelihood of various 12:10

things happening.

42 Q. Why have you avoided terrorist events so as a matter of interest?

A. Because we deal with major accidents and it's quite specific on that, we are not dealing with terrorist event, terrorist created events. 12:11

43 Q. Is that excluded in the legislation?

A. It's not included and the general view with the competent authorities in Europe is that they don't deal with it, there are separate organisations set out, usually security bodies to deal with that. The people who deal with Seveso don't attend those, it is the way it works. 12:11

44 Q. **MS. GRIFFIN:** Who is dealing with it in this case? 12:11

A. The Department of Defence as far as I know, someone from there deals with that.

45 Q. **MR. McELLIGOTT:** Do you think they should be involved in the planning process so as well? 12:11

A. I don't have a view.

46 Q. **MS. GRIFFIN:** You are aware that Shannon LNG is owned by an American company and there is an airport at Shannon where planes on route to Iraq refuel, you don't think this will be viewed as a potential terrorist target? 12:12

A. We do not deal with terrorism issues.

47 Q. **MR. McELLIGOTT:** You agree so there are many safety issues in this

application that you are not dealing with; is that correct?

A. I don't agree with that.

48 Q. Do you agree that there are many safety issues on this project that are not in your remit? 12:12

A. Yes, there may be.

49 Q. You agree so that there are many safety issues concerning this project that are not in your remit as you have just said so, therefore, the advice that you give to An Bord Pleanála does not cover all of the 12:12 safety issues; isn't that correct?

A. As I have said we cover the establishment and it is quite clear what we are giving our advice on. I am not going to advise An Bord Pleanála beyond that, that's a matter for them. 12:13

50 Q. No, I didn't say if you were going to advise them. Do you agree so that there are many safety issues which on this project which you are not dealing with in your advice to An Bord Pleanála?

A. Well, clearly there are issues in the estuary that we 12:13 are not dealing with.

51 Q. Not just the estuary?

A. And to do with terrorism.

52 Q. So other land based issues as well that you are not dealing with; is that correct? 12:13

A. As I have said in the estuary and to do with terrorism.

53 Q. **MS. GRIFFIN:** Do you look at the other planning applications that are going to be directly related to this one like the

pipeline and the electricity pylons, are the HSA going to do a report on the health and safety issues there?

A. If this development goes ahead and it's a notified establishment then there are land use planning controls around it and, therefore, we would expect that the planning authorities would refer applications to us for advice, is that the question you are asking? 12:14

54 Q. Yes. At that stage it will be too late, either the planning will be put through for Shannon LNG or it won't be, but do you think it's a good idea that these applications are all put in separately when an incident in one could impact on the others, do you think it should be put through as a whole rather than? 12:14

A. We try to stay as far as out of the planning process as we can in practice, it's quite a narrow role we have and we try and keep it as clear as possible. In other words, we will deal with what is referred to us by the planning authorities and we give advice on that and we don't go beyond that. If another planning application comes in we also give advice on that. 12:14

55 Q. Individually ...(INTERJECTION)

A. In general once this establishment, if it gets the go ahead, we would look at the land use planning advice we would give around that site and we would generally advise then the local planning authority of what we would consider to be suitable developments. If they want to put in another Seveso site there then that would be a special consideration and we would have to look at that in more detail because it wouldn't be 12:15

covered by our general advice.

56 Q. Okay. On 9 January you sent advice to An Bord Pleanála that you are not going to advise against giving planning to this project?

A. Yes. 12:15

57 Q. The following day you e-mailed John McElligott to say that you were taking on board documents that had been sent in so what is your position at the moment, are you still saying that you are not advising against planning for this project? 12:16

A. We gave the advice to the Board based on what we had. We did get additional information and as I said I listened to Professor Havens' testimony yesterday. We will consider what is in that. If between those there are issues that would lead us to revise our 12:16 advice we will revise our advice.

58 Q. Right. Land based issues?

A. There are quite a number of issues raised in that documentation.

59 Q. **MR. McELLIGOTT:** So does that mean that you 12:16 are going to inform An Bord Pleanála when you are finished the view of that?

A. Yes.

60 Q. Have you taken into account any alternative sites, you do not deal with alternative siting? 12:16

A. No.

61 Q. What about the cascading effects of other possible planning applications like the Semeuro petroleum storage facility, you said there something about if

there are two similar type of properties or type of developments, you consider it as the same type of risk?

A. I am not familiar now with this other development, I know nothing about it, to be clear on that, but in general terms industrial development would not be a problem certainly, strictly speaking probably outside the blue line, but it could be slightly further out on that. In other words, industrial development would be considered suitable relatively close to that site. 12:17

62 Q. Okay. Now we are getting into the idea that the pipeline that will be on the establishment going from the tanks out up to Foynes, or wherever the pipeline is going, some of that pipeline is going to be on the establishment and do you not think it's credible that there could be leaks in that pipeline? 12:17

A. I suppose it is.

63 Q. Any possibility of leaks in that pipeline within the establishment for this planning application, they have not been taken into account; is that correct?

A. I am not sure on that now, I cannot absolutely give you an answer on that. 12:18

64 Q. From what I see there now you have a terminal without any pipelines and they have given risk assessments on a certain type of credible events, but none of them include the pipeline and you said that the pipeline is in the establishment ...(INTERJECTION) 12:18

A. I am trying to probably summarise a lot of what I have dealt with. I seem to have a recollection about that pipeline, a discussion about it, I do seem to have a

recollection about it. Perhaps it was discounted. I don't want to give an answer to a technical question just off the top of my head on this one. Perhaps I can be given assistance there on whether it is or not. My recollection is that it may have been raised. 12:19

MR. FRANKS: Mr. Inspector, if I can just clarify. The pipeline is actually considered in the QRA, the above ground installation associated with it is covered in the QRA.

INSPECTOR: Thank you for that clarification. 12:19

MR. McELLIGOTT: Sorry, I didn't understand what he said, could he repeat it.

INSPECTOR: He said that the pipeline and the above ground installations which would be associated with it were included in the QRA. 12:19

MR. McELLIGOTT: There is something difficult there so because the planning application for the pipeline has not been submitted yet so how do they know where they are going to be put it in and if they know where they are going to put it in why is it not in the application because you cannot have one without the other. 12:19

INSPECTOR: Do the Applicants wish to answer that?

MR. O'NEILL: If I could just take instructions. If I may

deal with that, Sir. Apart from the pipes which are the intimate part of the facility itself, the application also assumes and the QRA also assumes that there will be a pipeline going to the boundary of the facility, this would be the pipeline to connect up to the BGE National Grid and of course which would be the subject of a separate application so it is anticipated there will be pipelines connecting up to the BGE site or BGE grid and insofar as they are contained within the site they have been assessed as part of the QRA. 12:20 12:21

INSPECTOR: You are talking about known technology and the likely layout of that?

MR. O'NEILL: That I would understand, that will be dealt with in due course by somewhere appropriately better qualified than I am to answer that question, Sir. 12:21

MR. McELLIGOTT: Mr. Inspector, in the pre-consultation discussions between An Bord Pleanála and Shannon LNG, An Bord Pleanála specifically raised the issue of assessing major accidents on the transportation of LNG out of the terminal and they asked the question of transportation of LNG on road, but the answer from Paddy Power was that it was going via a pipeline. He said there from Shannon LNG just now that they presume there is going to be a pipeline up to the boundary, will there not be a pipeline from the boundary into the tanks on the establishment? 12:21 12:21

MR. O'NEILL: Perhaps I didn't make myself clear, Sir. What I was talking about was a pipeline from the tanks to the boundary of the property. Obviously a pipe has to continue underground a further distance to connect up to the National Grid and that is the pipe that I was talking about which will be the subject of a separate application and an assessment. 12:22

MR. McELLIGOTT: I had a brief look at the QRA and I saw nothing about any risks being done on accidents from the pipeline, would they answer that, was there a risk assessment criterion on accidents from the pipeline? 12:22

MR. FRANKS: Sir, it's covered in my statement which I think we are due to take later today, perhaps we will address it then. 12:22

INSPECTOR: Okay, we will do that.

65 Q. **MR. McELLIGOTT:** Can I further go on so. The EIA, the European environmental assessment directive says that you cannot have project splitting, would you not agree that the possibility of many cascading events or ignition sources that could occur, credible ignition sources, one of the chief ones being static build-up that could be caused from, say, high powered electric cables that would help provide an ignition source and these have not been taken into account in the risk assessment? 12:22 12:23

A. **MR. CONNEELY:** Based on existing?

66 Q. Based on this current application because there is power lines that have to go into it, there is the pipeline, they are suggesting that a gas fired power station will be put on the site, subject to a separate planning application, they say that electricity to be supplied via 110 kV lines from the ESB network at Tarbert will also be subject to a separate planning application so what I am looking at here is I am looking at a planning application that is going ahead and they are putting in the minimum for this planning application so you cannot look at all the possible credible accidents that are occurring that will eventually occur on that site, you are doing it in a piecemeal method do not agree that you are not looking at all the credible accident scenarios because not everything that is needed for this project is being taken into account? 12:23 12:24 12:24

A. As I have said already we advise on what's submitted to us and that's the project that was submitted to us and the QRA dealt with that. We have given our advice to date on that. Again as I say we don't move outside of that, for us we don't move outside of that. 12:24

MR. McELLIGOTT: Once again we want the Inspector to note that it is not possible for the HSA to give all safety advice on this project because the full project is not being put forward for planning permission at this stage so we do not see what exactly is being built on the site so the HSA is not able to assess all the risks that are 12:25

possibly going to take place on the site.

67 Q. **INSPECTOR:** Mr. Conneely, does the HSA have a role when the power lines or the gas pipeline are put in subsequently, do you revise your assessment? 12:25

A. If the permission is given and they notify then as being covered by the regulations, we did highlight we had quite a role in there in terms of before construction and before operation they must submit safety reports to us which would be quite substantial 12:26 documents outlining that they are taking all necessary measures to prevent and/or mitigate against major accidents so issues like that would come up in that context. As I said earlier there is a European standard there on these type of facilities and they 12:26 would be measured against that. So they have committed I think anyway to comply with that, but that's what we would measure them against.

68 Q. **INSPECTOR:** Supposing you find that there is suddenly an 12:26 unacceptable risk, can you stop the project at that stage?

A. Yes.

69 Q. **MR. McELLIGOTT:** Mr. Inspector, you must note that this project is 12:26 so big that they are never going to stop it at that stage. Would you not agree, Mr. Conneely, that once a massive project like this starts on a greenfield site that's it, it has started?

A. I have no comment on that.

INSPECTOR: That's your view.

MR. McELLIGOTT: I am just asking would he think that would be the same. 12:27

INSPECTOR: It would be his view too or not his view, it's neither here nor there. If you want to express that as a view express it as a view.

MR. McELLIGOTT: Okay, I express that as a view so. 12:27

INSPECTOR: Mr. Robinson.

70 Q. **MR. ROBINSON:** I would like to ask one further question. Will you be reviewing your advice with regard to the Goa report that I mentioned yesterday to the US Congress made by 19 of the top world LNG experts when they report later this year? 12:27

A. Yes.

71 Q. You will be reviewing your advice? 12:27

A. Yes.

MR. ROBINSON: Thank you.

INSPECTOR: Ms. Griffin.

72 Q. **MS. GRIFFIN:** Catriona Griffin. Mr. Conneely, to your knowledge once a large scale project has started in Ireland has one ever been stopped due to a change or due to health and safety issues? 12:28

A. Just to health and safety issues, none springs to mind.

73 Q. So I would say it's very unlikely that if this project starts in my opinion no whatever what is discovered later on it's going to be very difficult to get it stopped?

A. Well, you may have that view. I suppose I can only tell you what our role is and it's clear enough. We have an inspection role there and there is a duty on the operator to do various things. That's what the unit I work with spend most of their time doing is inspecting those type of facilities and following up on issues relating to them. We are there to enforce the regulations at the end of the day. 12:28 12:29

74 Q. **MR. McELLIGOTT:** You said you requested further information from the Applicant, I think you wrote 20 questions in an e-mail, what was that further information to the Applicant that we have not been given? 12:29

A. I can read you the list of questions if you wish.

MR. O'NEILL: The questions in fact, I am sure Mr. McElligott is aware, the questions are actually on the table, the questions and answers are on the table and have been for the past few days. 12:29

INSPECTOR: Mr. McElligott, have you had an opportunity to look at those questions? 12:29

MR. McELLIGOTT: No, I did not realise, I was not notified that they were on the table.

MR. O'NEILL: We actually indicated the other day that they were being put on the table just before the QRA report was put on the table.

MR. McELLIGOTT: They were being put on the table, you never said the questions that were asked by the HSA to Shannon LNG were being put on the table. 12:29

MR. O'NEILL: Yes, we did.

MS. GRIFFIN: You said the QRA was being put on the able. 12:30

MR. McELLIGOTT: The QRA was already provided but he said nothing questions.

MR. O'NEILL: And the questions and answers I said subsequently. 12:30

MR. McELLIGOTT: I didn't hear that. Did you hear that, Mr. Inspector? 12:30

INSPECTOR: I cannot say.

MR. McELLIGOTT: Could we know what the questions are now.

A. Okay.

MR. O'NEILL: In fact there were more copies of the questions and answers on the table than now exist so some people have taken them. 12:30

MR. McELLIGOTT: I would like it just to be

recorded what the questions were.

A. Okay. The questions raised on November 15th was: Where in the EIS QRA were the exact dimensions of the tank and also the exact dimensions of the bund area; what pool fire sizes were modelled; could the Applicant point to an article on the suitability of using LNG event modelling; confirm whether methane or a custom mixture was selected PHAST for LNG modelling; if the NFP 59a [?] approach was followed what would be the accident of those deterministic zones; what is the basis for the retention capacity in 6.8.5 of the QRA; can you be more explicit on the failure frequencies used in table 3.3, they do not appear to accord with the frequencies used in Chapter 6-7 or 6K; there is a missing reference to a figure on page 42; can you demonstrate explicitly that the criteria in annex A, tables A2 of EN 1473, 2007 and A4 will be met; can I take it that the commitment to comply with EN 1743 of 1997 now applies to EN 1473 of 2007. 12:30 12:31 12:31 12:31

I suppose I should have called those out by numbers because I am running through them, it could probably cause confusion, sorry about that. 11: Have you checked the sensitivity of the risk output (a) in relation to the proportion of the time the tank is full, 90% full, etc., page 7 of the QRA, (b) in relation to the use of failure frequencies in the Purple Book; 12. Can you point me to a map that best 12:32

shows the nearest occupied dwellings in relation to the site; 13, following receipt to a response to question 3, should dispersion modelling be to 0.85 of the lower flammable limit rather than the full lower flammable limit? 12:32

The following questions then arose following a meeting with Shannon LNG on December 13 at which they presented the formal responses to the above questions: This is question 14: What is the composition of Liquefied Natural Gas and by how much does it vary; 15. Is the use of methane as opposed to a mixture of methane and heavier hydrocarbons appropriate when performing consequence analysis; 16. What is the rationale for exclusion of vapour cloud explosions from the QRA, what are the implications of the bund speed incident experience for the QRA; 17. Please provide justification for the frequencies and durations of unloading arm failures used in the QRA; 18. Please provide further information regarding vapour cloud ignition distances at the incidents in Cleveland Ohio in 1944, if available; 19. Is there any credible event at the terminal that could lead to a major environmental accident; 20. Should both early and late pool fire results be used in a risk based approach where early and late ignitions have been the sign of probabilities. 12:32 12:33 12:33

MR. McELLIGOTT: Mr. Inspector, the answers are not on the table.

MS. GRIFFIN: I just cannot find them, maybe they are.

MR. O'NEILL: I understand in fact we are now getting more copies, but there were quite a number of copies, I don't know exactly how many. One has just been taken and I think Ms. Griffin has arrived just too late. Mr. Lynch is handing over his copy and we will make more copies available as soon as possible and we will put them on the table. 12:34

75 Q. **MR. McELLIGOTT:** There was a report in the O'Sullivan report, it mentioned that if a vapour cloud starts that you could possibly ignite the vapour cloud before it moved into populated areas, did you look at anything to do with that? 12:34

A. Which O'Sullivan report is this?

76 Q. It was the O'Sullivan report, I think. I will just get back to that question. Dr. Koopman pointed out that there was an error in the QRA. He said that the flash fire hazard distance for a large hole D in the storage tank is 11.3 kilometres down wind, but the frequency estimate for such a hole is zero; therefore, the risk is zero, but in the body of the report a frequency of 5e to the power of minus 8 is used for a catastrophic failure, not zero, did you notice this error on the QRA? 12:35 12:36

A. No.

MR. FRANKS: Sir, I would be happy to

deal with that when we discuss the QRA later on.

77 Q. **MR. McELLIGOTT:** Can I be very specific about one issue. You have not questioned the possibility of an LNG spill on water; is that correct? 12:36

A. You will have to be more specific about that question now exactly what you mean by that.

78 Q. The QRA does not deal with any LNG spills on water from my brief reading of it? 12:37

A. It would deal with spills at the jetty involving failures of the loading arms.

79 Q. Spills onto water?

A. It is certainly a possibility, I would guess.

80 Q. You would guess? 12:37

A. Yes.

81 Q. I mean you either did look at it or you didn't or it does deal with it or it doesn't?

A. I am trying to answer for a lot of detail. I can look at my notes and I suppose find out and come back to you on it. At this stage my recollection would have been I suppose if it did leak what would happen, it could catch fire or it could spread and you could have a flash fire, would it have made any difference, what would the difference be there, I wouldn't have appreciated it as significant, but I would have to look at it before I can give you a precise answer on that. 12:37 12:37

82 Q. You don't think Dr. Havens video yesterday showed that it would be a little bit significant?

A. In what sense?

83 Q. It was just a very small spill of LNG on water, what we saw was fro ma small spill of LNG on water?

A. I don't think there is any dispute that if there is a spill on water there is a chance that it will ignite, so I agree with that, yes, certainly. 12:38

84 Q. You do not agree that it would be significant given what you saw in the video yesterday?

A. It relates to the quantities, it relates to the quantity that is spilled. 12:38

85 Q. Yes, but the quantity was very small, wasn't it?

A. It was, but I don't have the precise figure for that. As I said I made notes as his presentation yesterday, I will look at the quantity, but I just cannot do a direct comparison for you while I am up here as to how that relates to the QRA, if that's the question you are asking me. 12:38

86 Q. Yes. I just want to ask again so does that not mean that there are a lot of LNG specific issues in this application that would not normally be considered in other major hazardous sites because your land use planning criteria is based on a fertiliser plant up in Palmerstown? 12:38

A. No, that's a misunderstanding. We have a framework for giving advice, it depends on the identification of hazards on a particular site and different sites will have different types of hazards. The Kilkenny document is a published document of our advice to Kilkenny County Council in relation to a fertiliser plant and 12:39

it's based on our own QRA assessment that we carried out. The front of that deals specifically with the application in relation to the site at issue which was in the vicinity of a fertiliser plant. The remainder of that document is general and outlines how we approach land use planning and in fact I have quoted quite extensively from it in my presentation today. There is a substantial amount of detail in there about what we do look at and for bulk storage sites we look at one things, for LPG sites we look at something else, for fertiliser plants we would look at, and it sets out then in somewhat more detail in that document how we look at fertiliser plants, but it is a general document and it summarises the approach of the Authority to land use planning in somewhat more detail than I have given today. 12:39 12:40 12:40

87 Q. When you say there at the very beginning that you are only using a risk based approach, could An Bord Pleanála possibly ask you to take a consequence based approach to this planning application or is there something in legislation that says you take one or the other? For example, for us there are serious issues that are not being dealt with because of the consequences of an accident, we are not just looking at the probabilities of an accident so it seems to me that there are certain areas of safety that are just not being addressed and I think we are in a bit of a quandary here that we do not know really who deals with them, but if An Bord Pleanála made a ruling that they 12:40 12:40

wished for this particular application to look at the consequences of credible accidents, for example as outlined by Dr. Havens yesterday, would the HSA then have to look at what An Bord Pleanála would have asked them to do? 12:41

A. I will answer you in a couple of ways there. An Bord Pleanála I suppose can do what they wish, it's not up to us. They ask us for technical advice so we give them technical advice. The wording in the regulation says we advise them on the risks. Now. Risks includes 12:41 consequences and likelihoods, I suppose. It's a question of maybe deciding what's best practice in particular situations, but we have a risk criterion for new establishments from our board paper so therefore for new establishments we would look at the risk rather 12:41 than the consequence. There are countries in Europe that have more of a consequence based approach rather than a risk based approach. My understanding there would be that in deciding these matters they don't look at the consequences of worst events, they look at what 12:42 they call credible events so there is a judgment there made to the likelihood, it's not explicit, it is more 'this is credible, this is not credible' and they would look at that.

88 Q. Is there anything obliging you to take just the risk 12:42 based approach. If An Bord Pleanála asked you would you look at this specific case, because this is the first LNG terminal in Ireland, to look at it with a consequence based approach, is there anything in the

legislation that stops you from doing that? You said the criterion you use, but who decides what that criteria is, does that decision on the criteria you are going to use come from legislation itself or does it just come from a decision of the Authority that that's the criteria they are going to use?

A. I would say it comes again from two sources. It does say in our regulations we advise on the risks and the Authority in its policy has set out criteria based on risks. 12:42 12:43

89 Q. Is the policy set on regulations or do you set your own policy, can that be changed for this specific case?

A. The policy follows from the legislation. The legislation says give the advice on the risks. I suppose as we are giving technical advice it's up to us maybe sometimes to decide technically what's the right thing to do and technically we have decided for new establishments the right thing to do is go with the risks. 12:43

90 Q. So if An Bord Pleanála then said there seems to be issues here that are not being dealt with by other statutory bodies and there is a certain area or certain parts of the safety aspects that are not being dealt with, if you were asked by An Bord Pleanála to look at this using both a risk based approach and a consequence based approach would there be any rules within the HSA that would prevent you from doing that? 12:43 12:43

A. I don't know how to answer that except if they did ask us it would take us quite a long time to give them a

response. It would require us to develop a framework around that and also as well as that to make a judgment in any case. What I am saying is we are required to give technical advice, our technical advice -- and I am not prejudging the matter in any way, if we were faced with that we would have to say do we think it is suitable or not and if we were to give advice on that basis how would we give advice on that basis and would we think it is appropriate. I am not prejudging it and I don't know how we would respond, I have no idea. 12:44

91 Q. You just said there that you would take time, do you feel that you are under pressure with the fast track planning process here to give an answer quickly, if you had more time you would be able to do that; is that correct? 12:44

A. We got two extensions from the Board to submit our advice so certainly it was challenging.

92 Q. It was challenging, okay. So when the advice was challenging do you think you might have given a better opinion if you had had more time to give it? 12:45

A. I think we have given a good opinion. Notwithstanding that obviously there is more information there that we do look at. There were time constraints on everybody involved. We had some discussion about 9 January versus the 10th or the 11th, but the documents that were submitted to us in any case could not have been responded to within the time frame, your documents in other words, even if we hadn't given our advice until the 11th. We will look at those documents. Our view 12:45

is that if we consider the advice we have given is incorrect we will change it or we would advise the Board and what the Board do after that is a matter for them.

MR. McELLIGOTT: I would like the Inspector to note that we are now formally requesting that the Board would ask the HSA to formally look at both the consequences of accidents as opposed to just the risk criteria of an accident and to use that to assess this project because there seems to be no other statutory body that will be doing that and that's only for the land use planning criteria, that does not include the marine aspect which I do not know who could deal with that. 12:45 12:46

INSPECTOR: Okay. It's 12:45. I am going to...(INTERJECTION) 12:46

93 Q. **MR. KEARNEY:** Adam Kearney. I just want to ask Mr. Conneely have the HSA seen fit to engage any independent LNG expertise in compiling their report? 12:46

A. Not in this situation, no, we did not. The Authority took a view I suppose from the beginning of the land use planning that while consultants generally will do the QRA for the Applicants that in the normal course of events we would not engage consultants to assess that because as happens in some other countries you end up with consultants talking to consultants and everybody else is out of the loop. The view was taken that the competence would be developed in the inspectors to do 12:47

that. Having said that if the Authority is of the view that it doesn't have to competence to deal with it, it would get advice, it would seek expert advice.

94 Q. Would it be within the remit of the HSA to conduct an independent QRA? 12:47

A. I suppose we have conducted QRAs ourselves, but it does take up a lot of resources, the example that was referred to earlier in Kilkenny. I would in the Corrib case we consulted one as well or carried out one. I am aware of several other planning applications where it 12:47 was carried out. It depends on a number of factors and I suppose it depends on the particular situation so we could go either way, we have the option.

95 Q. Would you not see fit to conduct an independent QRA and this is the first LNG of its type in the country? 12:48

A. Well, we considered whether it was necessary or not, we felt that in land use planning terms the issues are not maybe as complicated, they are relatively straightforward in determining what the major accidents are. I think generally in the literature there is a 12:48 lot of agreement out there as to what the major accidents are and the consequences of those. There is possibly less agreement on the likelihood, but for those reasons it was decided that we would not carry out our own, but we would go with the Applicants QRA 12:48 making it clear precisely what it was we wanted dealt with.

INSPECTOR: One more question, Mr. Kearney, make it a good

one.

MR. KEARNEY: I will hand it over to Mr. McElligott.

96 Q. **MR. McELLIGOTT:** In giving your advice, your land use planning advice, does that advice not include the possibility of other port facilities or other ships within those contours? What I am thinking of, Shannon LNG say that it will not affect other marine use or deep water use of the port, but does the advice of other types of developments that you advise for or against, say, for example, for other ships coming right up to within those contours? 12:49 12:49

A. Well, I suppose again we are in the establishment area and that's what we are looking at. We give advice there on what the risks are. It's not necessarily us that would follow up on those issues; in other words, the marine area might not be under our control. 12:50

97 Q. Say mooring facilities for ships or other ships within those contours, you deal with houses, residents and you say types of establishments that could take place within those contours, but you not mention anywhere about actually mooring facilities for ships that would come into the port, you have given no judgment on that, just the facilities for holding ships, not the actual ships coming in but the actual mooring facilities for ships? 12:50 12:50

A. I am not clear.

98 Q. Because what I really mean is that if you don't deal with the maritime aspect of it when a ship comes in

that might be some other department that deals with that, but when it's attached to a port there are port facilities that would exist so would you advise against port facilities, you do not mention anything about port facilities that could exist in that contour and is that taken into account in the advice you gave as well because a sort of land use planning, the facilities for ships? 12:51

A. I suppose we probably should recognise that we deal with the risk on the site itself to be tolerable for workers so if it's a work related activity, and this is off the top without looking at it, it is likely I would say that work related activity would be considered acceptable. 12:51

99 Q. You say also the type of establishments, you say houses, hotels so you do say it's a type of establishment that is allowed, port facilities are not included in that criteria? 12:51

A. They are not included. I would like to think about that without giving you an answer off the top of my head. 12:51

MR. McELLIGOTT: We would like to request the Inspector would port facilities be included in the land use planning advice that the HSA should take into consideration when giving to An Bord Pleanála, would the site be suitable for other deep water facilities. 12:52

INSPECTOR: Okay, thank you, Mr. McElligott. I see

Mr. Fox you have your hand up.

100 Q. **MR. FOX:** Mr. Inspector, I have just two questions arising out of that. Will this document sterilise the land to the west of the site, you mentioned there in your submission that other suitable developments near but outside the blue line? 12:52

A. I suppose I have also said that we haven't finalised the contours yet. Certainly the QRA would form the basis for that, but we are looking at some of the sensitivities there to see that maybe we would extend on a little bit. By and large they would be quite close to the contours that were on that map. It's likely that industrial development would be permitted quite close to that facility. 12:52 12:53

MR. FOX: The second point I had there, Mr. Inspector. The joined-up thinking in relation to the overhead lines, I foresee a difficulty with the overhead line, the planning permission, this body are well aware that in other parts of the country there is stiff resistance to the building of overhead pylons and I would like An Bord Pleanála to take into account, I have said it the other day, about underground cabling that will eliminate that particular problem. Thank you. 12:53 12:53

101 Q. **INSPECTOR:** Just hold on, Mr. McElligott. I would just like to ask you would the undergrounding of the overhead lines and the undergrounding of the pipeline

make a significant difference to the impact of the proposed development and the power line and gas pipeline taken together?

A. That's a difficult question to answer from up here. I would suspect not, but I would not hazard a proper response to that without looking at the contribution to the risk and taking those out of it. I wouldn't like to give an answer from here. I could come back to you on it. 12:54

102 Q. **INSPECTOR:** Maybe it's not appropriate to ask a top of the head reaction? 12:54

A. In general we prefer pipes and power cables to be underground because there is less likelihood of things happening with them. Now, what is the absolute value, I cannot give you that. We have certainly a site which has a power line moving over it which we are trying to get rerouted so we have a preference for it, how big a contributor it would be I wouldn't like to hazard a guess. 12:54 12:55

103 Q. **MR. McELLIGOTT:** Mr. Tom O'Connor here next to me from Ardmore, he is within 400 metres of the tanks so if the contour lines are going to change I think it would be good to hear from him now. You said the contour lines are not completely fixed yet and they are on the verge of several residences? 12:55

A. I also said that even if they do move, certainly based on the sensitivities, for example that nearest

residence would still be less than 1 by 10 to the minus 6 so they won't move very far, but they will possibly move a little bit.

104 Q. I notice that some of the contours are right -- they seem to have found the contours just right outside somebody's residence and Tom O'Connor is one of those. Maybe you should just hear from Tom O'Connor there for a minute. 12:55

INSPECTOR: Can we have the contour map again. Mr. O'Connor, that contour map is not very clear to me in relation to your house. Can you show us where your house is? 12:56

MR. O'CONNOR: It would be Termkineely, it would be east of Termkineely. (Indicating) it's east of that -- no, west. 12:56

MR. CONNEELY: I think that would remain outside the zones.

105 Q. **INSPECTOR:** Essentially you are talking about a fine tuning? 12:57

A. Yes, that's correct.

106 Q. **INSPECTOR:** As you are thinking of it?

A. Yes.

INSPECTOR: Okay. Do the Applicants have any questions they want to raise? 12:58

MR. O'NEILL: No, sir.

INSPECTOR: The planning authority?

107 Q. **MR. SHEEHY:** Mr. Conneely, could you

just clarify for us, the red line, what's inside the red line is zone one?

A. I suppose to be clear there the zones I showed previously were for existing establishments. This is a new establishment. The criterion we have is that the 1 by 10 to the minus 6 should not extend to residential development. Specifically in relation to this we will have to develop the advice around the zones a little bit, but in terms of that, yes, the inner zone, the 10 to the minus 5 is the red zone; 10 to the minus 6 is the blue zone; and 3 by 10 to the minus 7 is the green zone. 12:58 12:58

108 Q. **MR. McELLIGOTT:** Mr. Conneely, does that mean if you have a contour around just one tank, just assuming there is only one tank being built, that you would not advise against another tank being built right next to it which is outside the red zone? 12:59

A. The standards suggests a suitable distance for tanks on a site, for example, I think it's half a diameter of separation distance. It is common to have multiple tanks on a site. 12:59

109 Q. They are going to really only want to build one or two in the beginning so if they want to build one that's a red contour and the lower one would say you shouldn't build in the blue zone something dangerous or within a specific distance, is it not strange then that they would have four tanks and the red contour doesn't go around the other four tanks because if there is an 12:59

accident in one and you could have cascading effects on other tanks?

A. Because of the construction of the tanks the catastrophic failure is more or less so rare it will not contribute greatly to the risk so the contributors to the risk there are smaller events. They have a sump there where the LNG will run in and, therefore, that tends to be the source of most of the events, the one with the highest risk, that's why that has that structure. 13:00

110 Q. Have you based all this on tanks of 50 metres height or 60 metres height ...(INTERJECTION)

INSPECTOR: I think we had that issue yesterday.

111 Q. **MR. McELLIGOTT:** I wonder did that change anything in the risk assessment? 13:00

A. The issue there would be the quantities that are released rather than the heights of the tank and how much would be released over what period. 13:00

112 Q. **INSPECTOR:** Can I just clarify the red, that marks a sump; is that right, the red contour just to the south of the first two tanks?

A. Yes. 13:01

113 Q. **INSPECTOR:** There is another sump between the next two tanks, is that of lesser significance?

A. I would have to look at the QRA to be able to give you

an answer on that, perhaps the Applicants can.

114 Q. **MR. McELLIGOTT:** Don't those red contours represent places where accidents could start and those contours around the source of the accident, what about the pipelines, if there is a problem with the pipeline which is on the boundary ditch for instance, shouldn't there be a contour around an accident in the pipeline as well? 13:01

A. It depends on the risk, you add up the risks and you see where the risks are. What that is representing is the risk and as it decreases then it shows another contour. Obviously there are lots of contours in between for intermediate risk and there is obviously somewhat a lower risk outside even the 3 by ten to the minus 7, there is a somewhat lower risk outside of that. 13:02 13:02

115 Q. Don't we have a lot of accidents really with pipelines. There was one there just a couple of months ago in Saudi Arabia and it killed 27 people, that was just in October. That was a pipeline going towards a LNG terminal, a liquefaction plant I think it was, but accidents on a pipeline will move the contour to different parts, but we are not looking at that at the moment and then residents' houses would be within the contours if you concluded those? 13:02 13:02

A. A considerable portion of the QRA dealt with pipe and pipe technology. They have argued that obviously a pipe and pipe is safer than just a pipe alone. The risk associated with that pipe is lower than a standard

pipe so I think the risks associated with the pipeline are low.

116 Q. There is nothing in the QRA I see with the criterion that mentioned the pipeline?

A. Oh, no, there is a significant portion of an argument in there because I remember discussing it with the Applicants about the technology. 13:03

MR. McELLIGOTT: I would like to Applicants to refer to where in the QRA that is because I think this is important. 13:03

MR. FRANKS: Would you like me to answer that now or do you want to deal with that when we get to my evidence?

INSPECTOR: Unless you feel that this would affect Mr. Conneely in any way, if it's just going to be clarification later on maybe then it would be better done later on. 13:03

MR. FRANKS: Okay.

INSPECTOR: Ms. Griffin.

117 Q. **MS. GRIFFIN:** Catriona Griffin. The outer red contour zone out on the water, my eyesight is letting me down a bit here, is that around a ship or around the jetty? 13:04

A. It's around both.

118 Q. Around both. So if a ship is not moored at the jetty, say it's just coming into the jetty and it is say a couple of hundred metres out wouldn't that affect the contour lines? I know you will probably say that it's not land based and it doesn't refer to you. 13:04

A. It doesn't refer to the activity at the jetty. We take account of the activity at the jetty, outside of that we don't take account of it.

119 Q. Who takes account of it?

A. I would say the port authority, but I am not giving you an absolute answer, that's who I think would be looking after it. 13:04

INSPECTOR: I think we will be coming to the port authority later on today. Does that conclude, I mean we could go on all day at this. 13:05

120 Q. **MR. McELLIGOTT:** If the port authority raise issues then the HSA should be there to reply back to some of the issues because the port authority might talk about something and we are going to realise 'what the HSA's perspective on that' and we would need Pat Conneely there for that submission as well. 13:05

A. I think we have made our role clear and where it stops. I wouldn't see that I would have a role there. 13:05

MR. McELLIGOTT: Isn't that just the problem we have here, that different bodies are dealing with different things. You say 'I talk about my issue, he will talk about his'. 13:05

121 Q. **INSPECTOR:** We have taken your concerns about that on board. Mr. Conneely, you are going to rethink things; is that right?

A. As you know, Chairman, we are under a lot of pressure in relation to this. We did receive documents late but within the period within which we indicated we would look at them. We have not had an opportunity to do that properly because in preparing for the hearing and so on. We also were interested in some of the testimony given. We will review our advice in the light of the information we have and we will then write to the Board if we have any reason to change it. 13:06

122 Q. **MR. McELLIGOTT:** Sorry, Mr. Inspector, he has just said there that he gave basically an opinion without having read all the documentation because he was under pressure to give an opinion, that is wrong? 13:06

A. It is clear we got the documents on 10 and 11 January, they were submitted to us and we sent advice on 9 January. 13:06

123 Q. No. You asked for two extensions and An Bord Pleanála kept saying you must get this in before 11 January because we need it for the An Bord Pleanála hearing so weren't you pushed to give an answer quicker than you would have had if you had had the proper time, enough time? 13:07

A. We always work under a dead line. Normally in responding to planning requests we have five weeks to respond. Now, there are possibilities for extensions under certain circumstances so we are often under pressure to give our advice. 13:07

124 Q. You felt under pressure to give the advice?

A. We were working to a deadline.

125 Q. Don't you think a top tier Seveso II site, LNG terminal, it's not a planning application for a sewer. Does he think that that would not have required more, you should have forced your hand and you should have said 'I am sorry, I am not giving you that answer as quick as you want it, I am giving you the answer in the time I think it should take to give the answer', do you not think you gave an answer too quick? 13:07

A. No. We gave advice to the Board, we were satisfied to give the advice. There was some confusion maybe on when documents would come in and when we would consider them. In fairness as we pointed out if there is technical knowledge out there, if there is reputable technical articles that point to something that we were not aware of that might influence our advice we would certainly look at that. If we did find technical information to what has been submitted that would cause us to alter our advice we would advise the Board on that, I think we would be duty bound to do that. 13:08 13:08

126 Q. Does that not mean so that the advice you have given is not definitive advice, you are going to, like the Inspector said, look at it again so at the moment the advice you have given, it's as if you have not given any advice yet really because you must look at this new documentation, is that not correct? 13:08

A. I can't add to what I have said.

127 Q. What I am saying is because you have said that you are going to look at new documentation and new submissions

which were given to you within the deadline that you had requested, that in actual fact you are invalidating your declaration of 9 January because you have just said that you must review it so it's as if you are saying that that opinion you have given on 9 January is invalid for the moment? 13:09

A. It is valid until we change it, one could put it either way.

128 Q. It's not a final opinion so; is that correct?

A. As I explained we have given our advice to the Board. We received documents which in fairness we are examining, if it turns out that there is information in there that would cause us to change our advice then we would advise the board accordingly. 13:09

129 Q. Normally for a planning application you will give advice and that's it. Now you have said that you are going to take this new information on board so you basically saying 'this is not our final opinion, we are still examining it and then we are going to give an opinion' so you are basically saying you have yet to give a final opinion to the Board, is that not correct? 13:10 13:10

A. I have nothing further to add.

130 Q. **INSPECTOR:** Mr. Conneely, do you have any idea how long it is going to take you to give this? 13:10

A. Again it depends on our own resources. It would require two or three days work probably and at that stage we would be in a position.

MR. McELLIGOTT: You would hardly type it up

in two or three days for god's sake.

INSPECTOR: Sorry, what was that remark?

131 Q. **MR. McELLIGOTT:** What I mean is there was such serious information given to you, you cannot take two or three days to do it, it will take longer to analyse all those documents? 13:10

A. Again the documents arrived on 10 and 11 January, obviously we read them, but I am saying we need more time to consider any issues that are raised by them. My judgment is two to three days full-time would clear that. 13:11

END OF CROSS-EXAMINATION OF MR. PAT CONNEELY BY THE OBJECTORS 13:11

INSPECTOR: Okay. It's 1:10, we will break for lunch. Maybe we could reconvene at 2:10 please. 13:11

(LUNCHEON ADJOURNMENT) 13:11

THE HEARING RESUMED, AS FOLLOWS, AFTER A LUNCHEON ADJOURNMENT

INSPECTOR: Good afternoon everybody. I wonder if people could take their seats when they are ready. Just in a further deviation from the originally scheduled sequence of events, I have decided that after the last speaker from the HSA, Mr. Conneely, it would be wise to ask the Shannon Foynes Harbour Authority to speak. So, I am going to call on Captain Coughlan. But before I do that, I just want to point out that a lot of copies of the questions and answers in relation to the HSA's queries have been placed on the table. So, they are there now. 14:14

MR. O'NEILL: And also, sir, copies of ecology reports, I think you might have suggested that they might be put on the table. They have been put on the table as well. Clearly, if anyone wants some copies and if the copies have run out I would ask the person or person who require an additional copy to ask us. Rather than us having to monitor whether copies remain on the table or not. 14:15

INSPECTOR: What I had intended in asking for the ecology reports was the second survey which you were going to carry out, I think, last summer and which didn't actually appear in the EIS. Is that included in those? 14:15

MR. O'NEILL: Yes, it is, sir.

INSPECTOR: Okay, Captain Coughlan.

CAPTAIN ALAN COUGHLAN PRESENTED HIS SUBMISSION AS FOLLOWS: 14:15

MR. COUGHLAN: By way of introduction. My name is Alan Coughlan and I am the Harbour Master in the Shannon Estuary. I went to sea in 1966, rose to the rank of Master with Irish 14:15
Shipping and came ashore in 1982 to work in the Shannon Estuary. I was appointed as Assistant Harbour Master in 1982 and in 1993 I was appointed as Harbour Master and I have been Harbour Master for the entire estuary ever since. I might also add that I am also President 14:16
of the International Harbour Master's Association, which represents Harbour Masters in about 40 countries throughout the world. That's just by way of introduction.

14:16

I thought that before getting into what we are about to hear that it might be informative to people to know what the Port Authority actually does, so hopefully it will be a bit informative for you.

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We were established by Statute under the 1996 Harbour's Act, that means we are actually governed by the State and we have to work within certain rules and regulations. Like any company set up, we have objects,

things we can try and achieve and things we can do. One of the objects that is incorporated in us is to take all proper measures for the management, control, operation, development of its harbour and the approach channels thereto. So, we have to control things properly and we have to ensure that development takes place properly. The other objective, which might seem a corollary of that, is to promote investment in its harbour. So, there are two things what we can do, among other things. 14:16 14:17

The port limits: It is the biggest port in the company, it runs from Limerick down to -- there is a line joining Loop Head and Kerry Head there to the west. You can see where the principle installations are at the moment, Limerick, Shannon Airport, Aughinish, Alumina, Foynes, Tarbert Island Jetty, which, sadly, is becoming decreasingly important, and Money Point Jetty. As we all know, the proposed development is directly opposite Money Point Jetty pretty much. 14:17 14:17

The types of ships we look at. I would like you to remember this shot, if you could. That's a ship going into Money Point and it is about the same size of the ships we are talking about will come to this LNG project. We handle those as a matter of fact. We handle them without incident. So just keep that shot in your mind please. We also handle them with three 14:17

tugs. It has been in operation for nearly 20 years without incident.

That's another installation at Aughinish. You can see there is a big ship on the outside, it is about 70,000 tonnes, and a small tanker on the inside in the region of 12,000 tonnes. A small installation at Limerick that handles ship at 5,500 tonnes and ships at Foynes. The only reason I didn't show you the other two installations, I don't have pictures of ships on them, so. 14:18 14:18

I dealt with this yesterday in a question and it illustrates the level of traffic in the estuary here. The total number of ships, it is the second line from the bottom, 905 ships in 2007. That makes the total movements 1810. I did some calculations and I think my notes tell me that it is a little under five ships every day coming in and going out of the estuary. That's nothing. Absolutely nothing. I would love to see 1000 ships a month come in and go out. It doesn't happen. If we were to add the additional two ships a week that Shannon LNG are talking about that brings the annual movements up to 2018 per year, or 5.5 ships per day. It is still nothing. That means that one of these ships, or any other ship, can arrive with absolutely nothing else in the estuary. It is not busy. It is not congested. 14:18 14:19 14:19

The range of cargoes we handle, it is not exhaustive but it is indicative of what we do. We handle dangerous goods, we handle petroleum, chemicals and heavy fuel oil, which are not dangerous but it is a pollutant, and we do it well. There are no incidents. 14:20

So, how do we control things? What happens to a ship? What happens? Who controls things?

Section 46 of the Harbours Act gives the Harbour Master, me, power to give directions as he thinks proper for the purpose of protecting persons and property or regulating traffic, and in particular for the following purposes. This is all germane to what people have been talking about in the last few days as far as I can see. Regulating the time at which and the manner in which the ship may approach, enter into, go out of or lie in or at any part of the harbour and regulating the position, mooring, unmooring, placing or removing of the ship. We do all of those things every day to ships. 14:20 14:20 14:21

If you look at regulating the time at which and the manner in which. That's to do with the tides. A ship just doesn't come in and say 'we are here now, take us in'. It is planned. It is well planned. It is well thought out. There is a good structure to it. The time of the tide may be very important to the time you berth the ship. The manner in which the ship may 14:21

approach, it includes the speed, the amount of tugs used, whether it is in daylight or in dark. Any of these things can be regulated and are regulated on a regular basis. Following on from that we can regulate the take or discharge of ballast. That is really to do with the draft of the ship, we can tell the ship that she must take more ballast to remain secure or she must take ballast out in order to make a certain draft. Regulating the loading or the discharge of the ship, that's possible. We have bye-laws in place to do that. I will come to that a bit later. 14:21 14:22

This is probably very important. Preventing the ship navigating within the harbour if the Harbour Master is of the opinion that it is or may become a danger to navigation. In other words, if it is going to interfere with something else do we move it? If it is in an unsafe condition do we move it? If it is going to sink do we move it? What do we do with it? These are things with which we are charged and they are things that we deal with, happily, not on a regular basis. But we have dealt with them before. 14:22 14:22

So, how do we get a ship into the port? We have a very strict procedure. We need pre-arrival information from the ship. We need information about the ship, about its machinery, about its crew, about its cargo, where it has come from, what ports it has been to in the last ten ports and we make a judgment whether we take the 14:22

ship in on arrival or whether we let her wait. But we have to have this as a statutory requirement, all the information must arrive in our office before the ship can enter the port. That information is also sent to Government so they can keep a record statistically of what ships came in and, also, keep a record of things like the security implications.

When we get that information and there is a slot at a berth we decide the time of entry. And it is our decision. It is not the ships. And it won't be LNG's, it will be our decision. We decide the conditions of entry. In other words, how many tugs do we want. If the weather conditions are suitable. Any of these sort of things we make a judgment on and we decide. We advise the agents who handle the ship on behalf of the owners, they are here locally, they make all the arrangements, and we advise the agents of the tug requirements, line boats, any other requirement that we have and they pass it on, organise it and get it at the jetty for when the ship arrives, or get it out to the ship before it is required. In other words, they are talking about tugs. We advise the pilot station and we advise the pilots.

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The next slide I am dealing with is pilots. This is probably the most important thing to remember: Having arranged to take a ship in, having given all the times to arrive at and the arrival points to arrive at he

just doesn't come in on his own. We put a pilot on board the ship and the pilot conducts the ship from the boarding point up to the jetty. Similarly, he conducts the ship from the jetty out to sea on departure. So, it is controlled. We control it. 14:25

We have eight licensed pilots in the estuary at the moment. They are all first class pilots. By that I mean qualified to the highest level. They are under direct control of the port. They report to me. I am 14:25 the Superintendent of Pilots. We give them their instructions, we monitor them, we keep track of them. We operate a pilot boat from the pilot station, we own that boat, the pilots don't. As I said before, the function of pilots is to conduct ships safely into and 14:25 out of the port. They are highly competent and they are continuously trained. We send them down to Cork, where they do simulation exercises on incidents in the river and they keep their professional training up to date that way. 14:26

We use new technology in assisting us berthing ships. I had hope that the next few slides would actually play, they don't, they are just static pictures. But I would like to show them to you anyway to show you what 14:26 sort of controls we have. This one is interesting. Well, to me it is interesting. It mightn't be interesting to you but to me it is interesting. By way of explanation. This is a laptop that the pilots carry

aboard the ship. They rig it up when they get on board and it is a DGPS receiver, which is a Differential GPS, it is a computer that has the charts in it and you can put the dimensions of the ship in it, you can show it where the receiver is and it will draw an outline of the ship, and it will show you exactly where the ship is at any time as it proceeds up the estuary. Which is not so important to us, what we really want to control is how we dock the ship. That's the crucial thing. 14:26 14:27

Now, this is a picture from a ship that's berthing stern to another. It is moving backwards, it is moving down towards the bottom of the screen into that berth that you see on the left-hand side. Now, if you look at that line there and that line there (indicating). Those two lines on the inside of the ship there. If you look at those two lines there is figures on them, you can't read them, one says 52.8, that's up at the front end, the topmost one, that means that that part of the ship is 52.8 metres away from the line of the jetty and the line of the jetty is extended up. The one at the bottom says the back end of the ship is 33.9 metres away from the jetty. We intend to use that technology for these modern ships coming in. That gives the pilot instant information of where he is in relation to the jetty and gives him total control. What you don't see in that picture are the tugs that are attached to that ship. I don't think we can do anymore. That's the safest we can make it. 14:27 14:27 14:28

There are a couple of other of these things. This one here, I show it to you because there is just here, ahead of that ship, there is a little sort of shadow or a blank envelope that mimics the actual ship itself. 14:28
That's a predictor. That will show you where your ship is going to be in two to three to four or five minutes. It doesn't matter how many, you can put it in yourself. If you don't do anything else that is where your ship is going to end up in five minutes. So, you can 14:28
predict what's going to happen, and as you approach a jetty that's vital because you can take action in time to prevent contact and to prevent damage. That ship actually swung, came around to the south and berthed at that jetty. Unfortunately it doesn't play, but there 14:29
you go.

The next one. That took a ship into a place called Littleton in New Zealand. It really is very interesting, in as much as it brings everything 14:29
together, if it had played it would have been wonderful. It shows you the little predictor, where the ship is going to be, and it shows you how the pilot conducted that ship more or less in the curved red dotted line, in through the entrance. He actually 14:29
stopped the ship inside, swung it around and backed it into the jetty. It is a very difficult maneuver but he was able to do it with this piece of equipment, and the assistance of tugs. It is possible.

Can we handle the proposed development? We believe we can. The one compelling argument as to why I say I believe we can is because the proposed ships will be no more difficult than the ships going to Money Point at the moment and we do it as a matter of fact. 14:30

There is plenty of water available, so water depth is not an issue. The least depth of water over the track with which these ships will proceed is 16.3m. These ships will come in at 12.5m. It is not an issue. We are the only port in the State with a proven track record in handling ships of this size. Nobody else has done it in the State. The swinging room of the proposed jetty is over a mile. And as I say there, that is an absolute luxury in terms of port operations. 14:30 14:30

If I could just digress here for a moment. In my position as President of the International Harbour Masters Association I have a large circle of colleagues who are Harbour Masters in ports where they handle this trade and they would kill for that room to swing ships. They swing ships, they shoehorn ships into docks, they are almost scraping the paint off the front of the ship. That's not an issue here. We have plenty of room. 14:31 14:31

The pilots have already been involved in extensive simulation trials of the jetty as it is proposed. And

I rely on them, more than anyone else, to tell me it will or won't work. And they tell me it does work, and it works very well. They have no problems with it. Pilots are a very, very independent bunch of people, even though I control them as superintendent, they are 14:31
not shy about giving you their opinion in any, way, shape or form and if there was anything wrong with this they would tell me, because they wouldn't do it.

The current ship traffic, as I have indicated before, 14:32
is minimal. I mean, I mean minimal. Traffic does not cross the ship. And that's the most dangerous situation you can have when you are trying to affect an operation like berth one of these ships. If you have the ship proceeding into the channel and you have 14:32
traffic flying across it, backwards and forwards, that's a huge issue. If you have ships going the other way, this way and that way, that's not such a dangerous issue, because a little adjustment gets you a long way out of the way. But the most important thing to 14:32
remember is there is no crossing traffic, so that danger is eliminated.

What do we need to safely handle these vessels? Sufficient capable tugs. We do not have enough at the 14:32
moment. But before we would handle them we would insist that they are here and we would do nothing without the proper equipment being in place. We need to be able to monitor, communicate and control on a

full time basis. We don't have the facility to do that at the moment. That's something we must address before we get this up and running. If it is to get up and running. We need modern bye-laws approved by the State covering the handling of hazardous materials. Our 14:33
petroleum bye-laws were written in the 50's, we are going to have to upgrade that to cover this eventuality, in particular, if it happens, and, I suppose, any other resource or procedure that will be identified in Marie QRA. 14:33

Coming on to the QRA. It is ongoing as we speak and it is being conducted by a firm from the UK called Marico Marine. It is expected that the final analysis or the final report will be issued to us by about mid March, I 14:34
am told. We chose an independent firm to carry out this work on our behalf. We chose a firm who are proven port specialists and have practical experience in ports and with these ships. The process to be completed in mid March. 14:34

The summary and the recommendations will be published and made available. The reason that's going to happen is because we want people to be able to measure our performance against the recommendations. We want 14:34
transparency. We want people to say, if there is a problem, you are not doing what it says you should do.

What other checks and balances are in the system? I

think it was alluded to previously, maybe Monday, the Department of the Marine have to issue a Foreshore Licence for this project to proceed. A Committee called The Marine Licence Vetting Committee advises the Minister in the final analysis as to whether it should be issued or should not be issued. The Marine Survey Office Surveyor sits on that Committee. The actual MSO people, they are there to look at issues about navigational safety and our operational procedures and they will veto the issuance of a licence unless there are satisfied that all their requirements are met in regard to navigational safety. They have told me that. So, basically, it comes down to this: Unless we get it right, the Port Company, no Foreshore Licence, no project. That's what it comes down to. 14:35 14:35 14:36

There was another contentious -- I suppose I brought it up -- about security yesterday, with Jerry Havens. As I said yesterday, I am the designated Port Security Officer for the entire estuary and my function is to ensure that all facilities have proper plans in place, exercise them, record the exercises and that there is an audible trail there for people to see. That is done under ISPS, which is the International Ship and Port Security code, it is and IMO resolution. Each port facility -- and Shannon LNG will be a port facility, Limerick is a port facility, all the individual things that I showed you there on the estuary, they are all individual port facilities -- they must draw up their 14:36 14:36

own individual port security plans and it is based on a formal security assessment.

When they produce the plan, initially the security assessment must be approved by the State. Secondly, the plans that they draw up must be approved by the State also. As I say, the Port Security Authority must ensure that all plans are in place. We will have the power to recommend prosecution if people don't comply or if they don't drill or if they don't carry out what they are supposed to do under the terms of the Security Plan that they have put in. 14:37 14:37

Security in the river, which is exercising people more than anything else I feel, not a lot I can say about it. But the Port Company is not a military or security organisation. Neither is anybody else in this room. Neither are any of the other facilities. We have no power to task the police or the military to do anything. We are civilians. We will not put our own staff in danger. And I don't think anybody could expect us to do that. All ports rely upon State security services to alert them of a heightened security threat. That's the way it works. The way the ISPS code works, there are three levels of security. Level 1 is everyday business, no threat or minimum threat. Level 2 is a heightened threat. Level 3 is immanent danger of action. The steps that people recommend is that you put a certain amount of security in respect of level 1. At level 2, where it is 14:37 14:38

heightened, you put more security in, and level 3, there is a debate going on as to whether you shut down or not. But that seems to be the commonly held way to do things.

14:38

In respect of LNG, if we receive a warning from the State about a particular vessel that there is a heightened threat of security we won't let him in. We would be foolish. We will await either the arrival of or permission from the military before the ship can enter. Or the security service, or whoever. But it is not going to be us, it is going to be somebody with a background in security who is going to make the final decision on this.

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Finally, chairman, you asked a load of questions. You asked questions of the HSA and myself and in an attempt to answer them I put together this. One of the first questions you asked was about control of ships in the estuary. It is controlled by the Port Company, and namely me, under the powers under the Harbours Act.

14:39

The Port Company is responsible for the safety of all marine activity on the water. When a vessel is secured to the jetty she becomes part of that jetty for the purpose of regulation and safety. I think the HSA referred to that this morning. The Harbour Master has powers to regulate to discharge if he is concerned, in particular, about the stability of the ship, the draft

14:39

of the ship along side, in relation to the available depth, the conditions of its mooring and whether conditions.

Finally, there were no communications between the HSA and the Port Company prior to the HSA advise. 14:40

I think the last thing you asked was: What was the intention of the marine QRA? It is to establish what must be done to eliminate, control or reduce risks to satisfy a Marine Survey Office. I can add to that. To ensure that we are doing the right thing and to give people a level of comfort that we are doing the right thing. That is why we are undertaking the QRA process. It doesn't form part of the HSA decision making process, as far as I know. That is based on the fact that we have had no communication. That is it really in a nutshell. 14:40 14:41

I have to add that I am not a gas expert, I don't pretend to be, but I do know how to keep a ship out of trouble, and the best way to tackle this is for me to keep the ship out of trouble. And if we can put procedures and resources in place to ensure that that's the way it happens you minimise the threat of an accident. Statistically the accidents in ports that have happened, as far as I can tell, there have not been too many, regarding collision and escape as a result of collision. That's all I have to say. 14:41 14:41

END OF SUBMISSION

INSPECTOR: Thank you. Just a very basic question. What is a ship? When does a boat become a ship? 14:42

MR. COUGHLAN: If it carries a life boat. If it carries a boat on board it becomes a ship. I don't mean to be flippant. There is a definition in the Collision Regulations which, to my shame, I can't recall, because I studied them in 1966. But there is a definition. 14:42

INSPECTOR: Well, I am thinking of --

MR. COUGHLAN: Okay, for the purposes of this, a ship, a commercial ship. We say in our bye-laws that every vessels which is a ship, in excess of 50 tonnes gross -- which is a measurement of a ship -- shall be subject to pilotage. So, for the purposes of, maybe, your question: A vessel in excess of 50 gross tonnes is a ship. 14:42 14:43

I think it is also important to add that every ship is under pilot. So, there is no ship going to pass that facility, or proposed facility, that will not have one of our men on board and be subject to pilotage and be subject to our control both inwards and outwards. There was a question that came up the other day about passing traffic and I think you raised the question with the HSA man this morning about another ship 14:43

striking the jetty or striking a ship alongside the jetty. The control there is that we have our own people on board the ship to conduct the ship outwards once it is clear of everything.

INSPECTOR: Are you saying that every small fishing boat over 50 tonnes will have one of your people on board? 14:43

MR. COUGHLAN: Every vessel that comes in will have a pilot on board. Now, there are small pleasure craft, there are small angling craft, there are local people who operate dolphin watching craft, they won't have pilots on board. They know the waters. We know them. They are licensed by the Department of the Marine in terms of passenger safety and in terms of safety of their boats. We don't see them as a threat. Things of that size, and even some trawlers, they are underpowered, they are not that heavy, say something of a 100 tonnes, if it struck the ship I doubt it would go right the way through. I mean, I don't know, this is just an opinion of mine. I have to say that we will await the results of our QRA and see what they recommend. 14:43 14:44 14:44

INSPECTOR: A small trawler, that would have one of your men on it?

MR. COUGHLAN: Yes, he would. I mean, a small trawler, you are talking about a deep sea fishing trawler, that sort of thing. Yes, he would have a pilot on board. 14:44

INSPECTOR: Right. Any questions for

the Harbour Master? Ms. Griffin?

MS. GRIFFIN: Captain Coughlan, I just wondered do the Port Authority have any control over or issue rules for pleasure craft in the estuary? 14:45

MR. COUGHLAN: The answer to that is no, we don't. There were powers given to us to make rules in relation to the use of personal water craft, these jet skis, we refused to do it. Because if you give them an area in which to 14:45 work by implication that area is safe for them and if they hit a floating or submerged log we are at fault. So we refused to go that far.

The issue of control of a pleasure craft. I mean, they 14:45 are subject to the same rules and regulations as everything else. If they cause an incident or if they cause a near miss or a hazard and it is reported to us we chase them up. By chasing them up, you know, we have bye-laws there. You write to a guy first and you 14:46 ask him for an explanation and you hope that that's sufficient to make him think about his actions into the future. And that's basically the truthful way we do it.

MS. GRIFFIN: Do you have any figures, do 14:46 you have any idea of how many people are using the Shannon Estuary for pleasure, or dolphin watching, or whatever?

MR. COUGHLAN: In relation to dolphin

watching, there are two known vessels that operate in the estuary to my knowledge. Now, I can get the figures. I don't know, that's the honest answer. But I suppose during the height of season, which might last for seven months, they would work seven days a week. I 14:46
suppose their capacity would be in the region of 30 souls, 30 people each. So, if they were there and half full, and my maths are not that good, but I don't think it would be too many.

14:47

The other thing about that is we know those people, we know the skippers of those boats. Everybody in the river knows them, the Tug Masters know them, the pilots know them, we know how they look.

MS. GRIFFIN: I am thinking as well of 14:47
small pleasure craft, individuals going out on a boat with a couple of people. Do you have any idea how many of those boats use the estuary?

MR. COUGHLAN: Not, I don't. If you were 14:47
to ask me for an educated guess I wouldn't say very many, because the estuary is a difficult place for small boats. The currents are very strong and there aren't many facilities for them. You know, there is nowhere to go, so. Other than 14:47
people in and out of Kilrush Creek Marina, I don't think there are that many.

MS. GRIFFIN: Okay, thank you.

MR. COUGHLAN: You are welcome.

INSPECTOR: Mr. McElligott?

MR. J. McELLIGOTT: Hello Mr. Coughlan. LNG spills on water, are you going to take account of that in your risk assessment?

MR. COUGHLAN: The answer to that is no, because I am not an expert. 14:48

MR. J. McELLIGOTT: How close will the ships go to Tarbert, the LNG carries, when they are turning?

MR. COUGHLAN: I would think they would be at least a mile away. 14:48

MR. J. McELLIGOTT: How close will they go to the ferry?

MR. COUGHLAN: At least a mile.

MR. J. McELLIGOTT: How wide is the actual navigational channel in the estuary? 14:48

MR. COUGHLAN: I made reference to it there in my presentation. One mile. If that is it I would be pleased to stand down. 14:48

MR. HEAPHY: My name is Morgan Heaphy and I live in a house which is 900 metres from this proposed site. Mr. Coughlan, you said that ships have been coming and going in the estuary about incident. Have ships ever run into trouble on the Shannon Estuary, to your knowledge? 14:48

MR. COUGHLAN: They have on the way in, one of them did on the way

in, Princess Vanja, ten years ago.

MR. HEAPHY: So you gave us false information, there was an incident.

MR. COUGHLAN: Just let me finish please. She was coming in without a pilot, she was not inside the inner harbour at all. Despite everything that was available to her, in terms of navigational aids, the Master wasn't on the ship, or wasn't on the bridge, and she ran aground on a sandbank. We got her off and we got her up to the jetty. 14:49 14:49

We subsequently, after that event, realised that we had a hole in our procedures and we amended them and we moved the pilot boarding out to cover ships of that size further out, so that in future no other ships would get into trouble of that same capacity. Does that answer your question? 14:49

MR. HEAPHY: Yes, I remember that incident well. Are you totally dependent on the technology which you spoke about to berth those ships. 14:49

MR. COUGHLAN: Absolutely not.

MR. HEAPHY: What happens when it breaks down? 14:49

MR. COUGHLAN: There are still eyes. There will probably be equipment on the jetties too.

MR. HEAPHY: But it is safer with the technology.

MR. COUGHLAN: No. Would you let me finish, please. What you asked me is do we depend on that technology. The answer is no. It is an aid. Like everything else in like, technology is an aid. That's all it is. You use your eyes. Most people can judge speeds. Fellows who have been to sea actually rely on their eyes heavily, and their senses heavily. But these aids just give you the edge, they do make it safer. I haven't spoken to LNG or the project developers but my impression would be that they would have similar equipment on the quay that would, in very big figures, put up the distance of the ship off each end of the jetty. It is kind of like a radar technology and it is used in facilities where large ships are handled regularly. So, in the event that our stuff breaks down there is a back up, number one, and, ultimately, the pilot can use his eyes, No. 3. I don't mean to be flippant about it, but that's the way it is done. 14:50 14:50 14:50 14:51

MR. HEAPHY: Can you confirm again that every ship entering the estuary would have a pilot.

MR. COUGHLAN: That is correct. 14:51

MR. HEAPHY: Every ship?

MR. COUGHLAN: With the exception of one that doesn't trade here anymore. He had an exemption ticket. The issue there

is the fact that any Master coming up for an exemption certificate in a vessel less than 100 metres must conduct a prerequisite number of trips into the estuary before I will examine him to see if he's a fit person to proceed without a pilot.

MR. HEAPHY: I live directly opposite where the pilots board and I know exactly when pilots are getting on and off the ships.

MR. COUGHLAN: Well, perhaps you would like to tell me quietly later.

MR. HEAPHY: I think it is something that the Inspector might look into.

MR. COUGHLAN: Okay. The other thing is that if we go ahead with this project I am going to insist that we put what we call a VTS system in place, Vessel Traffic Services. That's a location which overlooks the estuary, which would be manned 24-hours a day and will have radar imagery in the control centre, where people can keep an absolute track of what's going on. If something is out of the ordinary you can jump in straight away by radio and correct it. That's to me is a prerequisite for this sort of activity.

MR. HEAPHY: Thank you.

MR. COUGHLAN: You are welcome.

MS. O'CONNOR: Can I just ask you: There

was a ship that docked at Foynes Port a few years ago that turned over on its side. Would that be within your remit?

MR. COUGHLAN: Yes, I was in charge of the salvage operation for that ship. 14:52

MS. O'CONNOR: Was that due to human error, failure of procedures.

MR. COUGHLAN: It was due entirely to human error. That ship was a peculiar ship, it was what they call a float on float off ship. It was a floating dock. What actually happens is you flood the ship and it submerges beneath the surface, you float something in on top of it and you empty the ship of water again and it lifts whatever is in top, like a barge, you know. It is a very dangerous procedure, because you lose water plain area very quickly and the ship becomes unstable, and unless the people who are conducting the operation know exactly what they are doing it can turn over. There is series of valves that are controlled by keys, like a piano almost on the bridge, and without sounding too flippant about this, it was the Masters first time doing it and when it went wrong he started to play a concerto on the keys and it just made everything worse and the ship eventually just turned over. 14:52 14:52 14:53 14:53

MS. O'CONNOR: Was he one of your pilots?

MR. COUGHLAN: No, he was a Russian

Master. Our pilots don't do that sort of work. The pilots are there to take the ship from A to B and secure it to the jetty. That's nothing to do with our end of the operation at all.

MR. J. McELLIGOTT: Mr. Coughlan, exclusion zones, as recommended in Sandia, for ships, they talk about one mile roughly, will that have an effect on the shipping, if that exclusion zone is applied? 14:53

MR. COUGHLAN: There seems to be two. What is the size of a control zone? We will await the results of the QRA before we decide what that control zone would be. That's the first point. The second point is: Given the level of activity in the estuary I cannot conceivably see how it is going to interfere with shipping. 14:54

MR. J. McELLIGOTT: Okay. Will it interfere with other activities or future activities in the nearby -- the rest of the landbank, for development of other ships? 14:54

MR. COUGHLAN: I can't actually say that it will. You know, provided everyone's happy that the two industries are compatible and will lie together and there is enough space between them the movement of ships in and out to whatever is built there will be subject to the same controls, so I don't see an issue. 14:54

MR. J. McELLIGOTT: Well, considering LNG

tankers will have to be at berth for a pretty long time.

MR. COUGHLAN: No, 24 hours.

MR. McELLIGOTT: Yeah, but if there are going to be two a week. 14:55

MR. COUGHLAN: That's only 48-hours. There is a lot more than that in a week. What are you saying? Are you saying trying to say that when a ship is alongside everything stops? 14:55

MR. J. McELLIGOTT: They are talking about development of the rest of the landbank for port facilities.

MR. COUGHLAN: Okay. I am dealing with the here and now and the 14:55 here and now is what we are about in these ships. I am not really concerned about what's going to happen in the future because it is in the realm of dreamland at the moment. Nobody knows what is going to happen.

MR. J. McELLIGOTT: Well, it is also relevant 14:55 to the Development Plan of the landbank being, in the County Development Plan, proposed for deep water port facilities. So, it would have an impact.

MR. COUGHLAN: Fine, I accept your point, 14:55 but I deal with the water.

INSPECTOR: Captain Coughlan, can I just clarify. When you are talking about a control zone, that is only when the

ship is actually moving?

MR. COUGHLAN: Correct.

INSPECTOR: Are you clear on that Mr. McElligott.

MR. COUGHLAN: Well, no, if I could interrupt there. The control zone is when a ship is moving, because it is a zone around which you must control the access, too, for other ships to ensure there is not going to be a collision or an accident. There is also the issue of a control zone around the jetty while the ship is berthed and tied up to the jetty, to ensure that nobody comes too close to that activity. And that's probably going to happen. That is standard practice all over the world. So there are two control zones, there is the moving control zone of the ship in and out and the control zone around the jetty. 14:56 14:56 14:56

INSPECTOR: Well, the berth control zone then, what sort of size would that be? 14:56

MR. COUGHLAN: I don't know what the recommendation is going to be from our QRA. But, you know, looking at the size of the estuary and looking at the water and the availability and width 500 metres would not be a problem for us, to put a 500 metre zone in. Whether that is recommended or not I don't know. 14:56

INSPECTOR: 500 metres out into the estuary?

MR. COUGHLAN: Yes.

INSPECTOR: What about forward and aft of the ship?

MR. COUGHLAN: At the moment why they shouldn't put 500 metres each way as well, because there is not there. 14:57

INSPECTOR: But it could effect the rest of the landbank?

MR. COUGHLAN: It could. But as I say, and I don't want to split hairs, but I deal with the water. 14:57

Now, let's wait and see what the QRA says, because they are practical people that take a practical view on this. I just through 500 metres out to indicate what space we have there. So, we have to wait and see what they say. 14:57

MS. O'CONNOR: So when you say they take a practical, the QRA is supposed to assess risk and not be too influenced by what answers you wish to get. 14:57

MR. COUGHLAN: I accept.

MS. O'CONNOR: It has to be what the answers are.

MR. COUGHLAN: Well, we will publish the results of this and everyone can see what they recommend. I have no fear about that. Bear in mind this: That it is designed merely to prevent accident while a ship is alongside. And it is a navigational issue, it is a navigational 14:58

quantum. That is the space in which we work.

MR. J. McELLIGOTT: Dr. Havens talks about a half tank spill, loss of containment of half a tank on a ship as being a credible event -- what's the word? 14:58

MR. COUGHLAN: Event. You weren't paying attention.

MR. J. McELLIGOTT: Thank you. To be a credible event. So, if that's a credible event are you going to take account 14:58 of those credible events in...(INTERJECTION)

MR. O'NEILL: Sorry to interrupt, sir. That is actually a misinterpretation of what Dr. Havens said. Dr. Havens referred to the Sandia Report, which says that the loss 14:59 of half a containment within a ship may occur, whether it is credible will depend upon a lot of circumstances. And, of course, those are to do with the local circumstances and predominantly are judged by the local circumstances. I am afraid Mr. McElligott is 14:59 misinterpreting the position and this will be made very, very clear. It is made clear in the EIS and it will be made very clear by the witnesses to follow, sir.

MR. J. McELLIGOTT: I am not sure I agree with 14:59 you there now.

MR. HEAPHY: Can I ask just a simple practical question. Are the captains of these ships paid in relation to the

cargo that they are carrying in terms of how dangerous it is? And are the pilots paid in relation to the cargo and how dangerous it is, or the size of the ship? Is there a standard rate?

MR. COUGHLAN: I can only answer one part of that question. I have no notions of what conditions of pay and earnings are on board the ship. But the pilots are paid specifically on the gross tonnage of each ship. So, the bigger the ship the more they get paid. The smaller the ship, the less they get paid. It is a standard rate throughout the whole estuary. 15:00 15:00

MR. J. McELLIGOTT: I am almost certain Dr. Havens said yesterday that a half tank loss of containment is a credible possibility. However way it was stated it is that are you going to take account of that possibility in a QRA, because that will effect both emergency planning, you know? This whole problem here is that you are going to do the QRA which is going to prove -- and I have no doubt that you are capable of doing that, you are going to prove that you can get the ships in and out. But nowhere are you going to take account of an accident on the tanker itself. 15:00 15:00

MR. COUGHLAN: I will answer that question by saying to you that my concerns are navigational safety and if I can get that ship in without an accident that means that there is going to be no loss of containment. Do you accept that 15:01

point?

MR. J. McELLIGOTT: I do.

MR. COUGHLAN: That's my expertise and that's my remit. I can't really consider the issue of gas. I know where you are coming from and I think that the answer to this may lie in the planning in the future, for the emergency services. Each competent authority, of which we are one, has to plan from within its own remit. If there are issues like fire and noxious substances getting out that is a question for the fire services on each side of the river. I think that there should be a concerted joint planning function to cover this. 15:01 15:01

MR. J. McELLIGOTT: I agree completely with you there. But I once again point out now, and I want to bring it to the Inspector's attention, that there is a deficit here in who is going to deal with an LNG accident on a ship. We are not accounting for that. If there is an accident there should be an exclusion zone. It is for harm to people. The Sandia Report talks about one mile should half a tank spill, and that's touching the coast on both sides. 15:02 15:02

MR. O'NEILL: Again, this is a misinterpretation. Dr. Havens was very, very clear. The first question I asked him was did the Sandia Report recommend an exclusion zone. Remember we are talking about exclusion zones, not control zones, not safety zones, 15:02

exclusion zone. His answer was, no, it did not recommend that. In terms of marine issues, there has never been in the US and there is not in Europe an exclusion zone.

MR. J. McELLIGOTT: Okay, yes. But he did say that if there is an accident people within a mile are in danger. So, if they are being subjected to...(INTERJECTION) 15:03

MR. O'NEILL: That's a different matter.

MR. J. McELLIGOTT: Okay, right, let's talk about the different matter so. The different matter is if there is an accident on a ship where there is an LNG spill or an LNG accident there are people in danger within a certain distance of that ship and your QRA is not going to take account of the possibilities of the way an LNG accident can occur. You are going to prove that you can technically get the ship in and out and all that but you are not accounting for human error and an LNG spill on water. 15:03 15:03

Now, the land use planning criteria are only basing their risk assessments on what happens on the land and on the jetty. But as Koopman pointed out, there is more chance of an accident when the ship is moving. And it is coming right up through the estuary so there are a lot of other places in danger. As you saw in that clip yesterday, that was 44.9 m^3 of a spill of LNG on water and the tanks that are coming in, if there is a full leak of a full ship that is 265 m^3, which is 15:04

about 5,800 times more.

MR. COUGHLAN: Okay, well I have heard you say that before. The issue here is that -- I don't quite know what you mean by an accident on a ship. Would you explain that to me please? 15:04

MR. J. McELLIGOTT: An accident that will cause an LNG leak.

MR. COUGHLAN: How do you think that might happen? 15:04

MR. J. McELLIGOTT: He talked about two different ways. One was whether it was going happen -- what was the word? One was through terrorism.

MR. COUGHLAN: We have dealt with the way I am going to deal with terrorism here. 15:05

MR. J. McELLIGOTT: Well, you have asked me about it.

MR. COUGHLAN: And the other one was? 15:05

MS. O'CONNOR: Say a loss of structural failure, the ship itself.

MR. COUGHLAN: Just a sudden loss of failure, she breaks up?

MS. O'CONNOR: No, like any airplane crash, they are highly safety conscious but accidents still happen. I don't think you should be planning to deal with a major accident or emergency by saying it won't happen. 15:05

MR. COUGHLAN: I have not said that.

MS. O'CONNOR: Well, like saying how could it happen.

MR. COUGHLAN: I have not said that either. My point in saying planning should be addressed jointly. 15:05

MS. O'CONNOR: And I agree. But I would like somebody to clarify if there is an LNG spill over water who calculates that risk and decides the quantity of the risk and the quantity of the consequence? Who is in charge of that? Is it HSA or yourself? 15:05

MR. COUGHLAN: Can I just give you what happens now, if there is an accident on the water what happens now. If there is an accident afloat we are the competent authority for all things navigational and we interact straight away to see can we get that ship into a more safe position, or what can we do with it. If there is a risk of fire explosion or a leakage then it become and issue for the local authority fire services in the main. If people have to be evacuated then the Gardaí are responsible for that. It is a cumbersome thing, I know, but that's actually what happens now. I understand what you are saying and I understand that it is puzzling to you that not one person deals with this, and I accept that. I think that the way forward in this is joint planning. That really is all I can say on it. That's as it is now, I would prefer to see joint planning on this. 15:06 15:06 15:06

MR. J. McELLIGOTT: But who is going to take care of the emergency planning for an LNG accident on a ship coming up the estuary? Don't we have to know what areas are going to be effected before we make a planning decision, you know, on the marine side? 15:07

MR. COUGHLAN: On the marine side. If we do our risk assessment and we can take the ship in safely we have obviated a lot of risk because we know what we do in order to continue to operate in a safe manner. If you are talking about a structural failure, the only thing I can say there is that these ships are top end of the line in terms of safety, in terms of structure. Now, that's not to say that something is not going to fail, I accept your point. But I would think that these ships are built to the best highest possible standard, and I am not an expert in them, but they are certified by certification societies as being fit for purpose and, in particular, to be insurable. That's vital. Because there is a huge investment in these things. I am really not the guy to ask about this, about ships and ship structures, I think there are other people over there who would be more competent to deal with it than I am. I know what to do with them. I don't particularly know how to build them but I know what to do with them. 15:07 15:07 15:08 15:08

MR. J. McELLIGOTT: Maybe some of the Shannon LNG experts there could give an opinion on risks that an LNG tanker would face

while they are move that would have an effect on your job.

MR. COUGHLAN: Let's be clear about this now. The risks that an LNG ship can take are 24-hours a day, when it is moving at sea or close to the coast. That's the issue you should ask them about. The fact that it is approaching a port and people are onboard handling I make no difference to the scenario outlined about a sudden structural failure. I think that's pertinent to remember. 15:08 15:09

MR. J. McELLIGOTT: Then that goes back to the idea that everything you are doing in the QRA is based on the probability of an accident but not dealing with any of the consequences of an accident. 15:09

MR. COUGHLAN: If you look at it there is no obligation on us to do any of this, legally or any other way. Right. That's the first point I make. The second point is we know that we have to do things properly, we know we have to do things safely. 15:09

MR. J. McELLIGOTT: That "we" is the Shannon Foynes Port Company?

MR. COUGHLAN: Yes. And that's why we are undertaking this process. 15:09 As I say, whatever comes out of it will be available for people to see. All I can do is keep the ship safe. That's all I can do. I can keep it out of danger, and I will keep it out of danger. We are doing it every

day.

MR. J. McELLIGOTT: I am still now going back to what Havens was on about yesterday. Havens was on about we must take account of the consequences of an accident when we are siting terminals. 15:09

MR. COUGHLAN: He also said that they don't do it in America. That the rules are the same there, that the division of labour is the same in the States as it is here. It doesn't make it right, but we are not the only people in the world who have the same sort of set up. 15:10

MR. J. McELLIGOTT: And if it doesn't make it right I want it done right here. 15:10

MR. COUGHLAN: Well, that's a matter for the inspector to decide.

MR. J. McELLIGOTT: I want to tell the Inspector I want it done right here. Have you considered the possibility of ignition sources? 15:10

MR. COUGHLAN: No, I considered navigational safety, as I keep saying. I can't answer you any other way.

INSPECTOR: I have a questioner at the back. 15:10

UNKNOWN SPEAKER: Good afternoon everybody. I would like to ask this gentleman here a couple of questions. It has been

stated yesterday by Dr. Havens that when all communities and all political parties and everything else in America had granted access to LNG ships coming in they were all denied by the Coast Guard. So, obviously, there was a concern and apprehension about the safety of those coming into ports. So they were all turned down. 15:11

I also want to just touch on, maybe, the pleasure crafts in the Shannon. Now, a couple of years ago a big sailing ship came up and parked and docked in Foynes and it attracted a good bit of attention and a good bit of families that took their kids down to see it. I do believe that if those ships, these LNG ships, up and down from wherever, I do believe that they will discourage such trips by sailing ships and pleasure boats in general. So, the thing is, with the publicity that has gone out about this and the safety zones and the safety concerns and everything else, I do believe that it will be a very discouraging factor to the people involved in pleasure and scenic trips and everything else, dolphin watches and you know trips to Scattery Island and so forth. Those would be two of my concerns, would you address them, please? 15:11 15:12 15:12

MR. COUGHLAN: I don't know if I can address them to your satisfaction. I will certainly give you an opinion, that's about all. When you look at the Coast Guard denial of certain activities in the State I think you 15:13

have got to look at where they proposed to take place. One of them was in Long Beach in California, which is in the middle, to my knowledge -- i have been to Long Beach many times but it is a long, long time ago -- it is a very densely populated area in terms of industry and in terms of people. That's point 1. It is also a fairly tight place to get in and out of, where they were talking of putting the plant. Other places in the States that they have denied has been Weavers Point. They planned to build it in between two bridges, which there wasn't enough space for a ship to get in and get out. And the Coast Guard rightfully denied it. That's my only knowledge of the Coast Guard activity in relation to LNG projects in the States. 15:13 15:13

In relation to your second question, and again it is not definitive, my answer, it is only an opinion. There is that much space in the estuary that the presence of one of these ships, I don't think, will discourage anything. That's my own honest opinion. You may differ and that's fine, and nothing I can say can change your opinion. That's all I can say to you, I am sorry. 15:14

UNKNOWN SPEAKER: I would just like to follow up on what you said about the Coast Guard discouraged ships coming into densely populated area. I don't believe there is any part of the world that isn't populated now and everybody that lives to a potential terminal, you know, their lives 15:14

are, even though they may not be as many, but those lives are as important to those as a million people. They are all human beings. We are all human beings. I would just make that point.

MR. COUGHLAN: I accept your point of view entirely. I have no quibble with that whatsoever. 15:14

UNKNOWN SPEAKER: Thank you very much.

MR. COUGHLAN: You are welcome.

MR. KEARNEY: Mr. Coughlan, just a quick question. Have Shannon Development or Kerry County Council requested any information from you in regard to the berth control zones? 15:15

MR. COUGHLAN: No. 15:15

INSPECTOR: Mr. Fox?

MR. FOX: Mr. Inspector, I noticed that Mr. Coughlan said that the QRA would be ready about mid March. If it is ready mid March and, as I understand it, the deadline for the planning authority is the end of March that leaves a very narrow window for people to look at the report, Mr. Coughlan's report, and for people, maybe, to make comment on it. That's number 1. No. 2: My employers, the ESB, have asked me to place on record that they have some concerns about a queuing system for ships coming into the river. The reason for this is at some times, because of maintenance work on the jetty in Money Point, it can happen that stocks of coal get very 15:15 15:16

low on land and then they want a priority for their ships to come in to give us a supply of coal.

MR. COUGHLAN: Has he addressed that to you or me?

INSPECTOR: I think it was a statement more than a question. 15:16

MR. COUGHLAN: Do you want me to comment on it?

INSPECTOR: Not really, no. I would like you to address the question about the queuing of ships, or the possible queuing of ships? 15:16

MR. COUGHLAN: Okay. ESB take about 17 ships a year in, as far as I know, that I can recollect. And, again, I would point out to you that I don't see this as a big, big issue, it is only a matter of planning with people how to move these ships and the sequence in which they should be moved and I don't think there is anything that can't be solved without sitting down and planning it properly. I would ask you to carry that back to ESB, No. 1. No. 2, if they berthed ships 24-hours a day you wouldn't be in this problem. I would like you to take that back as well. 15:17 15:17

MR. HEAPHY: Just a question for Mr. Fox. I am a bit puzzled as to what level that question from the ESB came through Mr. Fox. Was that from local level or from national level? And what authority have you to 15:17

ask questions on behalf of the ESB? You are representing the Tarbert Development Association as far as I know. Maybe you could fill me in on that one.

MR. FOX: Mr. Inspector, to clarify something. I am here on behalf of Tarbert Development on one hat. I am here because of I have a submission on my own on another. And this morning my boss in Money Point asked me to convey and get you to put on the record their concerns about the queuing system. 15:18

MS. O'CONNOR: What's his name, your boss?

MR. FOX: My bosses name is Michael Kelly. He's the Manager of the port and the docking facilities in Money Point.

MR. HEAPHY: If this is so important should the ESB not put in a formal question? Would you not agree, Mr. Fox? 15:18

MR. FOX: I certainly would, but my boss communicated --

MR. COUGHLAN: If I can throw some light on that. We are to meet the ESB formally about this matter in the next week, if that clarifies anything for anybody. 15:18

MS. O'CONNOR: You also said that you would favour a VTS. 15:18

MR. COUGHLAN: A Vessel Traffic Services system. It is a combined radio and radar controlled centre.

MS. O'CONNOR: In the future.

MR. COUGHLAN: Yes. By future I mean before the start up of this operation. If it is to start up.

MS. O'CONNOR: Right.

MR. J. McELLIGOTT: Just more or less a point to the Inspector really. Yesterday Shannon LNG were very insistent on pointing out where they thought the remit of the Seveso II Directive applied regarding whether it was the jetty or whether it was the establishment, or you know. So, for me it was almost like they wanted to know -- it was almost, to me, as if there was areas where the Seveso II Directive would be more stringent and areas beyond that which would not be stringent. So, I would like to say that we would like the estuary to be treated as if it was under Seveso II because that would be in the best interests on safety of the general public. 15:19 15:19 15:19

MR. COUGHLAN: Well, if you are to make the whole estuary a Seveso site it also is a candidate site for a Special Area of Conservation, it is going to be a big problem. 15:20

MR. J. McELLIGOTT: There is a lot of the estuary already a special area of conservation.

MR. COUGHLAN: The whole estuary is. 15:20

MS. O'CONNOR: And a proposed national heritage area, pNHA.

INSPECTOR: Do you have anymore substantial questions for

Captain Coughlan?

MR. J. McELLIGOTT: I would like if the QRA that was undertaken for the Marine Risk Assessment would include a lot of what is done on a land based QRA for LNG spills. 15:20

MR. COUGHLAN: It is a navigational risk assessment. That is all it ever is going to be, and I can't make it anything else because we have no expertise.

MR. J. McELLIGOTT: Okay. So, therefore, I would like the Inspector to note that the QRA that is being undertaken at the moment, regarding LNG spills and what would cause them, is not being continued on the marine site and, therefore, there is a deficit on risk identification and, therefore, assessment. 15:21 15:21

MR. COUGHLAN: Could I ask you also to note something. That, in my opinion, if we endeavour to keep the ship out of danger we obviate the risk of a catastrophe. And that is the whole object of the exercise. Thank you. 15:21

MR. J. McELLIGOTT: I would also like them to note that he said he only deals with navigational issues and not with LNG accident issues. 15:21

MR. COUGHLAN: I am stopping now.

MR. J. McELLIGOTT: Okay.

INSPECTOR: Okay. Have we got everybody? Thank you. You

didn't want to ask any questions?

MR. O'NEILL: No, thank you.

INSPECTOR: Thank you Captain Coughlan. Now, I am going to call on the applicants to resume their presentation which they were doing early this morning. 15:22

MR. O'NEILL: Thank you, Sir. I am going to ask Mr. Blair MacIntyre now to deal with marine issues from a safety point of view. 15:22

MR. J. McELLIGOTT: Mr. Inspector, there were two speakers before that and we would like probably to ask them questions because they had spoken for so long and they have raised a lot of issues. For example, you asked where was Eileen O'Connor this morning and if they have to wait for another three or four hours to ask questions again. It would nicer if we could question each one in process and for them to keep their submissions short. Mr. Coughlan's was perfect, he communicated all the time. But they seem to be reading long streams of stuff and then we are all bored to death by the time it goes around to asking questions. 15:22

MR. O'NEILL: I am sorry Mr. McElligott feels he is under that difficulty. I did note he was missing for part of this morning, perhaps he was bored senseless, as he complains. But if he was here he would have noticed, in fact, at your suggestion, we have skipped through 15:23

areas of the report. I suspected, and it may still happen, that Mr. McElligott is going to complain that we are skipping over areas of the report. I would have thought that a better use of time would be achieved if all the evidence in relation to health and safety, both the land based and marine based, was dealt with before questions are asked. Because what we have noticed is that witnesses or people who have delivered statements are asked questions on matters entirely outside the areas of which they have been discussed. Health and safety issues were raised in the modules dealing with the need and site locations, site selection. I think one has to at this stage focus on the actual module. We are giving evidence in relation to that module and the efficient way to deal with questions arising from that is to listen to the evidence and if there are matters that are not answered ask questions. But don't start asking questions before the submission is completed. 15:23 15:23 15:24 15:24

MR. J. McELLIGOTT: Okay, Mr. Inspector, you did say in the document that was sent out from An Bord Pleanála that documents that were already submitted must be taken as read, and evidence evening they had 37 pages in one document and 40 pages in another. 15:24

INSPECTOR: Yes, I accept that, but I did correct that at the end of yesterdays proceedings and I think the applicants have taken that on board in their first presentation

this morning and I would like to give them the opportunity of continuing in that vain.

MR. J. McELLIGOTT: Just one other point is that the half an hour was to take Dr. Havens back to the airport, because he came out of his way to come over from America for nothing. So, I was just rushing back from the airport and I was only half an hour late. Thank you. 15:24

MS. GRIFFIN: And we can't afford to pay a taxi to bring Dr. Havens to the airport. 15:24

MS. O'CONNOR: May I also say that I wasn't here this morning but I was told that you wished to ask me something so I am here now. 15:25

INSPECTOR: I will talk to you later about that, it is just something very minor.

MR. O'NEILL: Mr. MacIntyre please. 15:25

MR. MACINTYRE PRESENTED HIS SUBMISSION AS FOLLOWS:

MR. MacINTYRE: Mr. Inspector, my name is Blair MacIntyre. I will not go through my CV, because we have done that part of it already. My principle points of evidence will cover: Design of LNG ship berthing; offloading and associated facilities; marine facilities construction activity; LNG shipping operations; safe navigation of 15:26

LNG ships in port areas; safety hazards and risks associated with LNG shipping.

Design of LNG Ship Berthing Offloading and Associated Facilities. The site layout of the proposed Shannon LNG terminal, reference EIS Volume 2, section 2.5.2.2. I will not read further through this because it is basically repetitious of many of the things already in the EIS. So I would like to skip down one paragraph to the ship manoeuvring simulation carried out at the National Maritime College of Ireland. 15:26 15:27

NMCI, Ringaskiddy, Co. Cork was used to test safe berthing of LNG ships and to confirm the viability of jetty location. Reference EIS. NMCI modelled the Shannon Estuary, including the entire navigation route which LNG ships visiting the proposed Shannon LNG terminal will take. Irish Hydrodata provided all the tidal current data recordings which were also loaded into the model enabling very accurate conditions to be simulated. Shannon LNG provided manoeuvring data and ship handling characteristics for three different sizes of LNG ships, including the largest ones which the terminal is designed to accommodate. This was used along with models of the large tugs which will be employed to assist the ships. The facility was used by six of the current eight Shannon Estuary pilots to simulate the arrival, berthing and departure of ships under various environmental conditions of wind, tide 15:27 15:27 15:27

and current.

The initial simulation exercise spanning five days was used to confirm the viability of the preferred jetty location, to identify and refine handling techniques and to investigate the power and number of tugs required. The exercise also included simulated emergency situations such as a tug failure or a complete power failure on board the ship. 15:28

The design objectives of the jetty I will also skip over because I think they are dealt with comprehensively.

The next paragraph "LNG jetty", I will also skip over. I will take you to the section "the jetty head will comprise". 15:28

The jetty head will comprise the unloading platform, six mooring dolphins and four breasting dolphins. The mooring dolphin layout is based on the Oil Companies International Marine Forum (OCIMF) standard industry recommendations for angles of mooring lines. To development the layout each size ship was positioned against the jetty in simulation and the berth was designed symmetrically to accommodate ships berthed in either direction. There will be a total of four cryogenic arms, three for unloading LNG and one for returning vapour to the ship. The platform will 15:29 15:29

include space for one additional LNG unloading arm. Although not written here, I will add the point that Captain Coughlan made, that instrumentation on the jetty will include distance off and speed of approach indicators which can be read from on board the ship by the captain and the pilot. 15:30

The trestle connecting the jetty head to the shore was designed to include a roadway for operational and maintenance access. The trestle will support the LNG cryogenic pipelines, utility and fire protection systems and the seawater intake and discharge pipes for the vaporisation system. 15:30

As determined by sea state and tidal high research carried out by Halcrow, the jetty platform level has been set at +9m OD Malin Head to remain clear of extreme water levels and waves over the predicted life of the project. 15:30

The next section deals with the construction of the materials jetty and I propose that we skip over that. "If constructed, the materials jetty" we skip over. The next paragraph "in the LNG evaporation process", I think we should skip, and also the next one on the seawater pump house, because they are rather repetitious. I would lead you to 3.2, "marine facilities construction activity". Equally, I would like to skip through that because it is dealt, I think, 15:31

comprehensively and covered by others.

There is just one section in that on page 9, the second paragraph, to record that the jetty construction contractor will be required to liaise closely with Shannon Foynes Port Company Harbour Master and piloted superintendent in relation the scheduling of activities. 15:31

Support barges will be moored and anchored so as not to interfere with traffic in the navigation channel and in accordance with guidelines established by the Harbour Master. 15:31

I would now like to skip to 3.3, "LNG shipping operations". 15:32

Shannon Foynes Port Company (SFPC) is responsible for all maritime activities in the estuary. The Harbour Master and piloted superintendent has authority over all matters related to pilotage, direction to vessels and movement of vessels. 15:32

The next section I propose to skip, as Captain Coughlan has described it rather well. There is one, figure 6, which is "pilotage in the Shannon Estuary", that is also represented in the EIS and shows the predicted path of the ship. 15:32

I would now like to direct you, Mr. Inspector, to page 11, second paragraph, "follow on simulation exercises".

Follow on simulation exercises are planned at NMCI to establish limiting operational parameters such as wind speed and direction and to identify the location of any additional navigational aids required, such as buoys, to mark shallow water areas to the east and west of the berth. The simulations will include transit from the pilot boarding station through the Béal Bar channel and into and out of emergency anchorages. At a later date the full training programme will be prepared to qualify Shannon pilots in the handling of LNG ships and this will be undertaken in conjunction with tug masters and the captains of LNG ships scheduled to deliver cargo to Shannon LNG. 15:33 15:33 15:33

LNG ships delivering cargo to Shannon LNG's terminal will require tug support for all phases of arrival and departure, for estuary channel navigation and for standby fire fighting cover duties during cargo discharge operations. This is referenced in the EIS. Although there are well established tug boat operations in the Shannon Estuary, they are not adequate for the proposed LNG trade and will have to be upgraded or supplemented by high powered tractor tugs equipped with fire fighting capabilities. The number and final specification of tugs required will be derived with input including data from ship manoeuvring simulations 15:34 15:34

coupled with feedback from other established LNG operations and by reference LNG industry standards. Present indications are that four tugs will be required. Each will be powered by twin diesel engines, with an approximate total power of 5,500 horsepower, 15:35
giving approximately 65 tonnes of bollard pull. It is intended that at least two will be classed as escort tugs, signifying that they are specifically designed for assisting a vessel in providing control by steering and braking, as necessary. They will also carry a fire 15:35
fighting notation indicate that they are equipped with high pressure, high capacity water jet monitors and a water spray system to an international fire fighting standard. Mooring boats and gangs will also be contracted to provide services for arriving and 15:35
departing ships.

The mooring equipment has been designed to hold all sizes of ships in position in wind speeds of up to 60 knots in any direction, with a three-knot current 15:35
parallel to the berth and a half knot current off the berth without exceeding 55% of the breaking load of any mooring line. It is therefore designing to restrain ships in weather conditions far exceeding those under which they would be allowed to enter the port. Thus 15:36
providing a high margin of safety.

I would now like to skip ahead two three paragraphs to page 12, the 4th paragraph.

During LNG unloading a pipeline from the shore storage tank will return vapour to the ship's tanks via a return vapour arm, making the entire transfer operation a closed loop system with no venting to atmosphere. 15:36
Throughout the cargo transfer operation close communication will be maintained between persons responsible on board ship and on shore supported by automatic monitoring devices and continuous foot patrols on deck. 15:37

During the LNG unloading operation the vessel will simultaneously load seawater into the ballast tanks to provide stability when the cargo tanks are empty. There will be no discharge of ballast while the vessel 15:37
is within the Shannon Estuary.

The outward passage will, in most respects, be a reversal of the inward passage, with one tug in attendance escorting the vessel back down the estuary. 15:37
The ship will have been at the berth for approximately 24 hours and in Irish waters for around 28 to 30 hours.

Shannon Foynes Port Company is charged with oil pollution prevention and control in compliance with 15:37
Irish national and international legislation and has established a response team with local port users. The team carries out annual exercises to ensure readiness and swift reaction to any incident. Also, as required

by legislation, SFPC in cooperation with the local authorities, the Irish Coast Guard and the port users has developed a Marine Emergency Response Plan for the entire Shannon Estuary. As a new port user, Shannon LNG will join and cooperate fully with these activities, including preparation of a Marine Emergency Response Plan. 15:38

I will now move to section 3.4: Safe Navigation of LNG Ships in Port Areas. 15:38

The principle objective of safe navigation of an LNG ship in a port area is elimination of the risk of a high energy event which could potentially result in breaching the LNG cargo containment system. A typical high energy event would be grounding at speed on a pinnacle of rock or a collision involving another large displacement vessel striking the side of an LNG vessel in the cargo tank area. All LNG ships have a double hull structure within which a separate cryogenic cargo containment system is located. In this respect LNG ships are naturally very robust, as illustrated in the following figures 6 and 7. 15:38 15:39

Figure 6 shows a membrane tank ship with an outer hull and inner hull and the cargo containment within side that and a clear space between the hulls. In figure 7 a moss spherical type ship is shown with a very, very robust side structure and bottom supporting the 15:39

spherical tank. That is required because, of course, there is no deck on the ship and all the strength must be built into the sides and bottom of the ship, which makes then extremely robust in terms of resistance to collision damage. 15:40

The next section "admiralty charts..." is well covered, I think, within the EIS so I would skip one paragraph to "elimination of the risk". 15:40

Elimination of the risk of a high energy collision involving an LNG ship is effected by having control over the movement of the LNG ship and over the other vessels capable of being party to such a collision. In the Shannon Estuary control is exercised by the current 15:40 requirements for all vessels navigating within the estuary to have a pilot on board and will be supplemented by a moving safety or control zone established around a loaded LNG ship in transit. The pilots communicate with each other and, where 15:40 appropriate, with the Vessel Traffic Service Station on shore and will adjust the speed and course of the vessel they are controlling to ensure that a predetermined distance is maintained between the LNG ship and any other large vessel in transit at the same 15:41 time. By this arrangement other large vessels will not enter the LNG ship safety zone and will not pose a risk of collision. The size of the safety zone will be determined by the Harbour Master, the determination

being largely based upon local circumstances, including the layout of the port, the type and frequency of marine traffic it handles and the speed of transit. Usually there are no strict safety zone regulations placed on small vessels or leisure craft, which pose no threat to an LNG ship, other than the normal navigational requirements to keep well clear of large displacement vessels in transit.'

15:41

The Shannon Estuary currently has an average of about six ship movements under pilotage per day, three inward and three outward, the majority of vessels being of around 40,000 deadweight tonnes or less. By international port standards this is very light marine traffic and there should be no difficulty or significant delay involved in vessels keeping clear of an LNG ship's moving safety zone based on the initial proposal of about one ship per week ultimately increasing to an average of two per week.

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An LNG ship approaching the jetty will do so either directly from the west, but more likely by turning in the estuary to berth from the east with the bow of the vessel heading west. This is illustrated in EIS Volume 4. This will result in the LNG ship turning no further upstream than approximately half a mile east of Ardmore Point. The Tarbert-Killimor ferry route operates more than one and a half miles or two and a half kilometres further upstream and will be unaffected by any LNG

15:42

shipping activity. This is shown in the EIS Volume 4, appendix 3A.

When approaching the jetty the LNG ships are virtually immune to cargo leakage from typical damage such as could be inflicted by a tug both impact or by heavy contact with the jetty structure. Only the outer hull would be involved in these relatively low energy events. 15:43

The safety of an LNG G ship berthed at the jetty could potentially put at risk by the navigation of other large vessels if they passed close by at speed. There is potential for the wash from a large displacement vessel to overstrain moorings or for an allision (classed as a collision with a stationary vessel, structure or object) if the passing vessel suffered power and/or steering failure. The Shannon Estuary off Ardmore Point, where the LNG jetty is located, is more than one mile wide, allowing transit vessels to pass well clear of the berthed LNG ship and outside the range of potential wash or allision damage. In any event a large tug will be maintained on station acting as a combined guard and fire fighting boat during any period that an LNG ship is on the berth and would always be available to intervene and assist if a passing vessel lost power and drifted towards the LNG jetty. 15:43 15:44 15:44

Lloyds Register was commissioned to carry out a review of casualty data in 2004. The review included all severe collision incidents worldwide during the previous 15 years involving vessels greater than 50,000 deadweight tonnes. This was undertaken using Lloyds 15:44
Register Fairplay's SeaWeb database, which contains over 140,000 ships and forms the worlds principle source of maritime information. The report identified 154 individual vessel incidents, of which 17 involved vessels of doubled bottom or full double bottom and 15:45
side skinned, i.e. double-hulled vessels. Of these 17 incidents ten occurred whilst the vessels were stationary or travelling at reduced speed in the port, in restricted waters or in a river channel and of the ten incidents two resulted in pollution, although in 15:45
both cases the pollution involved spillage of fuel oil but not cargo, and both incidents involved vessel of single side skin and double bottom construction i.e. not vessels having a full double hull such as fitted to all LNG ships. 15:45

The report concluded that there had not been a collision incident involving a large double sided vessel in the previous 15 years which has resulted in significant damage to the inner hull. In effect, the 15:46
report confirmed that there had not been any incident in the previous 15 years involving a large double hulled vessel of identical or similar construction to a modern LNG ship in a port/navigation berthing situation

which had resulted in penetration of the inner hull. This report is available.

It should be noted that the source data for the report included not only LNG carriers but also the full range of tankers, including LPG and chemical carriers, very large crude carriers (VLCCs), ultra large crude carriers (ULCCs) and certain large bulk carrier and container vessels. None of these vessels are subjected to the same regulatory controls or accorded with the same moving safety zone and tug escorts that are provided for LNG ship transits in port areas. 15:46

Safety of LNG ship navigation within the Shannon Estuary has been addressed in a preliminary Major Accident Hazard Assessment which was detailed in the EIS and which I will discuss in more detail later. This assessment was carried out at an early stage in order to identify and address any potential major hazards generated by the proposed shipping activity which may impact human beings or the environment. The work was carried out in advance of the marine QRA currently being undertaken by Shannon Foynes Port Company. The QRA will provide the Harbour Master with additional data on which to base his requirements for Shannon LNG's marine operations and will also give an independent assessment of Shannon LNG's proposals. This process is in line with SFPC's policy and with industry recommendations such as promoted by SIGTTO. 15:47 15:47

Section 3.2 - Safety Hazards and Risks Associate With LNG Shipping.

Safety considerations associated with marine transportation of LNG differ from those associated with land based storage, handling and processing of LNG the emphasis in marine transportation is on providing secure marine cargo containments systems and protecting them from the perils of the sea and navigational incidents. This is referenced in the EIS. 15:48

The International Maritime Organisation (IMO) has developed standards for the design, construction and equipment of all classes of ships, including a code covering "Ships Carrying Liquefied Gases in Bulk," with specific reference to LNG. The US Coast Guard has developed additional requirements for LNG ships trading to US ports and International Classification Societies, such as Lloyds Register of Shipping and The American Bureau of Shipping issue rules and regulations for the 15:49 construction and routine survey of LNG ships. These rules and regulations are designed to ensure the structural strength and watertight integrity of the hull, the safety and reliability of propulsion and steering machinery and the safety and effectiveness of 15:49 the systems installed to project cargo and crew.

Strict adherence to IMO, USCG and Classification Society standards has enabled the marine industry to

compile an outstanding record of safe LNG shipping operations spanning more than 45 years. Since 1962, LNG has been transported worldwide by sea in regular trade routes without a major release of cargo or a major accident involving an LNG ship either at sea or in port. The SIGTTO records show that as of 31st December, 2007 LNG ships have made more than 52,000 voyages worldwide and safely delivered more than 4 billion cubic metres of LNG. 15:49

15:50

Actual grounding incidents and theoretical calculations together suggest that, even from initial speeds of 12 knots, rupture of the cargo containment system is non-credible under the port approach conditions. Final approach to the proposed terminal will be undertaken at speed of approximately 5 knots or less and in waters having a large under keel clearance. 15:50

Collisions giving rise to concern would have to involve another large vessel travelling in the opposite or in a crossing direction. For another vessel to approach within collision range, would imply failure of the Port Authority and pilots to restrict the simultaneous movement of over shipping in the vicinity of an LNG ship in transit. The Review of Collision data referred to in the previous section demonstrates the minimum risk of damage to an inner hull of an LNG ship under port transit or berth conditions. 15:50 15:51

The successful risk management of LNG shipping and the operation in LNG ports can be contributed to the special construction features and unique operational controls that have been applied to LNG shipping movements within ports. These include: 15:51

- Independent cargo containment systems located within an outer double-hulled structure.
- Effective vessel traffic systems restricting other vessel movements 15:51
- The use of escort and guard vessels
- Provision of adequate tug power to control LNG ships, even in a dead-ship condition.
- Strictly enforced operating conditions of wind force, tidal currents and visibility, and 15:51
- Strict training and qualification standards for crew and pilots.

By building on established LNG shipping management principles and controls Shannon LNG believe that the 15:52 proposed LNG ships, during transit and at the berth, will not be exposed to any operational risk with the potential to breach the cargo containment system or otherwise result in spillage of LNG. LNG ships will be managed such that in the event of human error or 15:52 mechanical failure resulting in a grounding, collision or allision incident, the consequences will be limited to a low energy impact having minimal possibility to initiate release of cargo.

The liquid cargo and vapour handling equipment and pipe work on board each LNG ship is fabricated from cryogenic materials, primarily stainless steel, and utilises very conservative ratings of pressure and stress. As far as practical, it is all of welded construction to minimise areas of potential leakage such as bolted flanges and connections. The pumps that discharge the LNG cargo are electrically driven and totally submerged at the bottom of each tank. There will be no pumping equipment on the deck of the vessels. 15:52 15:53

LNG ships are fully self-sufficient in their fire detection and fire fighting capability. All LNG ship crew members receive extensive training in dealing with shipboard fires as is mandated under IMO Conventions, including the Safety of Life At Sea (SOLAS) and Standards of Training, Certification & Watchkeeping (STCW). 15:53 15:53

The IMO codes covering LNG ships requires them to have fire detection and fire fighting equipment in excess of that required by conventional oil ships. In addition to the gas detection systems surrounding the cargo detainment, there are detectors in compressor rooms, motor rooms, main engine room and accommodation areas. Heater fire detectors are located at cargo tank domes or covers at the cargo transfer manifold and in the 15:53

engine room and accomodation spaces.

A preliminary major accident hazard assessment was carried out for the shipping activity associated with the proposed Shannon LNG terminal. This is referenced further. 15:54

This initial assessment was carried out in order to identify and address at an early stage any major hazards that may impact human beings or the environment. The assessment includes major hazard identification potential impacts, prevention, mitigation and residual impacts. Shannon Foynes Port Company is currently undertaking a detailed QRA covering all navigational aspects of shipping in the estuary. 15:54

The following items were identified as potential major hazards associated with the LNG shipping operation: Grounding, collision, fire, accidental release of fuel oil or cargo, deliberate release of fuel oil or cargo. That refers to terrorism. 15:54

Each of the above hazards was evaluated to identify the most significant potential impacts on human beings and the environment. Preventative measures in place or proposed were evaluated for effectiveness against each of the potential hazards and mitigation measures in place or proposed to be taken in the event of an 15:55

incident were reviewed with the aim of reducing risk to as low as reasonably practical (ALARP), thereby identifying any residual impacts/

In addition, the consequences of a large release of LNG cargo, either accidental or deliberate, when addressed together with extracts from a report ("The Sandia Report"), released in December 2004 by the US Department Of Energy Sandia National Laboratory, New Mexico, US. The report is entitled "Guidance on Risk Analysis and Safety Implications of a Large Liquefied Natural Gas (LNG) Spill Over Water". This report is the most authoritative document currently publically available on the subject, although it is considered by many within the industry and by some regulatory authorities to be overly conservative and further research continues. At this time it is used by US regulatory authorities in evaluating and mitigating against worst case scenarios for new LNG projects. However, the probability of a worst case scenario coming is extremely low and, therefore, the overall level of risk remains low.

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15:56

This is all documented in the EIS.

15:56

Summary:

The Major Accident Hazard Assessment considered grounding, collision, fire and accidental or deliberate release of cargo or fuel oil and arrived at the

following conclusions:

1. The risk of grounding, collision or allision is minimal.
2. The risk of accidental release of cargo or fuel is minimal. 15:57
3. A deliberate terrorist attack on the ship could result in release of cargo with fire.
4. Effective management safety and security practices can mitigate the potential impacts of events to manageable levels. Risks from intentional events such as terrorist attacks can be significantly reduce with the appropriate security, planning, prevention and mitigation. 15:57
5. The consequences of cargo release fire were evaluated against US Department of Energy Sandia National Laboratory Report 2004 and demonstrated that: 15:57

- no shoreline areas would fall within the high potential impact zone around the ship, even under a credible worst case terrorist attack scenario. 15:57

- Only three small shoreline areas would encroach within the low potential impact area, even under a credible worst case terrorist attack scenario. 15:58

Mr. Inspector, I would now like to address some responses to submissions made.

The first submission: Concern that LNG ships in the estuary will pose risks to local communities, to travellers on the roads of Clare and Kerry and on the Tarbert-Killimor ferry. Also concern that the ferry sailings will be delayed by LNG ships and there will be negative effects on the two existing ports in the Shannon Estuary. There will also be an effect on all leisure boats use the estuary. 15:58

this submission was by Bríd O'Brien, Kathy Sinnott, DB Marine Research Associates and Kilcolgan Residents Association. 15:58

Shannon LNG's response: Under all normal operations as detailed in EIS Volume 4, appendix 3B the presence of LNG ships either moving or berthed within the Shannon Estuary will present no risk to travellers on the roads or ferries of Clare or Kerry. Even under a highly unlikely credible worst case scenario, as describe in the EIS, of a successful terrorist attack on the ship resulting in the release of LNG and a pool fire there would be minimal risk to the public and only in three specific small shoreline areas. As shown in the EIS and described in my earlier written statement, LNG ships manoeuvring in the estuary will never be nearer than two and a half kilometres from the Tarbert-Killimor ferry and cause no disruption to its operating schedule. When an LNG ship is in transit there may be a small delay to another ship if it is under pilotage at the same time in the same area, but 15:59 15:59

given the low level of shipping activity in the estuary (referenced in the EIS volume 2) the overall impact will be negligible, as will the impact on local industry or other ports in the estuary which are many kilometres upstream from the proposed LNG terminal. 16:00

The next submission. I have not seen any evidence of a proposed exclusion zone around LNG tankers. Several accidents have occurred involving LNG tankers. This submission was by Catriona Griffin. 16:00

Response: There will not be any exclusion zone applied around LNG ships but there will be a safety or control zone. As described in the EIS, Volume 4, Appendix 3A and Appendix 3B and earlier in my witness statement, 16:00 appropriate safety measures around LNG ships will be established by the Harbour Master. The next extract is from the EIS.

"Once clearance has been granted inward passage will 16:01 commence with any port safety and security measures as defined by the Harbour Master in force around the vessel. These measures, including any specific restriction on other vessel movements, will be in place for the passage to the LNG terminal". "On completion 16:01 of mooring, any measures in place around the vessel during passage will be replaced by measures appropriate to the cargo discharge phase of the operation".

EIS Volume 3, Appendix 3A presents an overview of the LNG shipping safety and gives a listing of all significant incidents which have occurred to date. The introduction states: "Since the inception of LNG maritime transportation there has been very few major incidents involving LNG ships, none of which have resulted in spills or loss of containment due to breaching of cargo tanks." 16:01

The next submission: The most serious economic concern is that the gas industry's own standard recommended exclusion zone of two miles around an LNG tanker will stop shipping - including the Tarbert-Killimor car ferry - in the estuary every time an LNG tanker is in the area (and Shannon LNG plan up to 125 tankers per year) and prevent marine use of the rest of the landbank if those safety standards are implemented. The landbank will only be fit for other dirty projects, which if assessed along with the LNG gasification terminal would almost certainly be denied planning permission. 16:02 16:02

This submission appears in various sections in the Kilcolgan Residents Association.

16:02

Response: The gas industry does not recommend an exclusion zone of two miles around an LNG tanker. It recommends that the dimensions and shape of any zone should be determined in the context of the specific

conditions of a port. I have already stated that LNG ship operations will not cause any disruption to the operating schedule of the Tarbert-Killimor ferry and there is no aspect of Shannon LNG shipping operations that will prevent marine use of the rest of the landbank because there will be no exclusion zone. As described in my testimony and in the EIS volume 4, the movement of the LNG ships will not interfere in any significant way with any other shipping in the estuary given the low level of shipping activity, the safety measures to be applied by the Harbour Master, the intended route of the LNG tankers and the width of the waterway. In addition, once the LNG ship is moored alongside the jetty there would be in prohibition of any vessel mooring at an adjacent facility if that facility had been properly designed and the adjacent vessel observed the necessary safety precautions determined by the Harbour Master. LNG ships moor near other berthed ship and vice versa in many harbours of the world, including Boston, Barcelona, Yokohama and Osaka. 16:03 16:03 16:03 16:04

Submission: Is the limited exclusion zone proposed by Shannon LNG around the tankers taking into account the risk of an emission source as well as the risk of collision? This was submitted by the Kilcolgan Residents Association. 16:04

Response: The safety or control zone defined by the

Harbour Master will serve to restrict the intrusion of ignition sources which may pose a threat to the LNG ship.

Submission: "As a consulting engineer responsible for a number of successful jetties and marine works, the writer strongly objects to the project as proposed, stating it to be inadequately planned. He officially resents the project". This submission was by Dr. Peter McCabe. 16:04 16:05

Response: The writer provides no basis for his objection, either as to why he feels it is inadequately planned or why he resents it. In the absence of specific objections Shannon LNG cannot provide a specific response. 16:05

Submission: A responsible person, during the operational phase must ensure that a contingent plan sufficient to deal with the eventuality of the introduction of petrochemicals (from fuelling etc.) is in place and made available to NPWS. Oil spills due to increased ship traffic are a potential threat to populations of many bird species in the outer Shannon estuary. This submission was from The Department of Environment, Heritage and Local Government. 16:05 16:06

Response: As described in the EIS, Volume 4, Appendix 3C, the risk of pollution from LNG shipping operations

is minimal.

> "By building on established LNG shipping management, principles and controls Shannon LNG believes that the proposed LNG ships during transit and at the berth will not be exposed to any operational risk with the potential to breach the cargo containment system or otherwise result in spillage of LNG. LNG ships will be managed such that in the event of human error or mechanical failure resulting in a grounding, collision or allision incident the consequences will be limited to a low energy impact having minimal possibility to initiate release of cargo or fuel oil. Thus, hazard risk from the release of flammable vapour and thermal radiation will also be minimal. The risk of environmental pollution will also be minimal."

16:06

16:06

EIS Volume 2, section 3.3 describes the pollution prevention and control measures in place in the estuary and with which Shannon LNG will be cooperating and complying in full.

16:07

I think I have read through that before so I can skip down.

16:07

Port operating procedures to be developed and approved by the Harbour Master and administered by Shannon LNG's Marine Superintendent and HSE Manager will address pollution prevention and control from all sources and will be made available the NPWS. As recorded in EIS Volume 4, Appendix 3C, Shannon LNG does not propose to supply bunker fuel oil to ships visiting the terminal and no bunkering facilities are being installed.

16:07

Therefore, there is no risk of oil release during a bunkering operation. There will be no discharge of ballast water from LNG ships while they are in the Shannon Estuary (as referenced in the EIS).

16:08

Submission: The developer may require to consult with the Marine Institute regarding dumping at sea in the event of any dredging. No work should be commenced on the foreshore before the appropriate foreshore leases/licences have been obtained. This submission was from the Department of Agriculture, Fisheries and Food and also from the Kilcolgan Residents Association.

16:08

Response: Shannon LNG would say that no dredging work is envisaged but the disposal of any excavated or spoil material from marine works is addressed in EIS, Volume 2, Section 7.13.7.

16:08

> "If suitable, the excavated material and the spoil from pile installation will be used in the earthworks or landscaping ashore. If not suitable for reuse the material will be disposed of to landfill or at sea. One possible sea disposal site will be to the east of Scattery Island.....

16:09

This location has been used by Shannon Foynes Port Company and others for the disposal of dredge spoil. The sea disposal option would require a dumping at sea licence from the Department of Communications, Energy and Natural Resources. The licence would be subject to conditions to minimise environmental impact. Shannon

16:10

LNG is presently in the process of preparing applications for shore release licences related to all marine work.

The next **submission**: That no QRA has been done for the marine side of the operation, a submission from Kilcolgan Residents Association. 16:10

In **response**: The Shannon Foynes Port Company is carrying out the QRA independently of Shannon LNG. Shannon LNG undertook a major hazard assessment of the shipping activity including application of a consequence analysis considering a credible worst terrorist attack scenario based on Sandia report criteria which are based on the assumption that no mitigation measures are applied. This considers an LNG spill of 50% capacity of one cargo tank of the standard sized LNG ship. This is reported in EIS volume 4 appendix 3C. 16:10 16:11

The next **submission**: The site is not sufficiently distant from centres of population as per SIGTTO guidelines and port criteria must satisfy ships of capacity up to 265,000 cubic metres, a submission from Kilcolgan Residents Association. 16:11

My **response**: Having been continuously involved in the activities of the Society of International Tanker and Terminal Operators (SIGTTO) since its foundation in

1979, and having been a director and vice president of the society I am very familiar with its workings and objectives. Industry organisations, including SIGTTO, and the Oil Companies International Marine Forum (OCIMF) which publishes advice and guidance on many aspects of oil and gas tanker safety and operational best practice. The guidance is just that, it does not have regulatory authority and does not substitute for international, nationals or local rules and regulations which govern shipping activities. This is especially true of safety distances related to radiant heat from potential fires or vapour dispersion distances which can only be calculated and defined by the regulatory authority having jurisdiction over such matters for the location in question. 16:12 16:12 16:12

It is appropriate to note some extracts from general text in SIGTTO publications:

> "Criteria should not be understood as absolute values. These recommendations are just basic guides to prompt special inquiry into particular aspects. Furthermore, the actual values still depend on local conditions which have to be covered individually port by port." 16:13

Turning now to the SIGTTO publication "LNG Operations in Port Areas", page 17, section 4 and under the heading of Terminal Site Selection it states as follows: 16:13

> "Invariably, and especially for

> receiving terminals located in developed port areas, the site selection process is formed by many considerations other than the risk implications of tanker operations. Therefore, compromising some or all of the principal criteria for site selections is often unavoidable."

16:13

In other words, what SIGTTO recommends are not in any way hard and fast criteria, often many items have been varied, evaluated and if found necessary mitigation has to be applied. However, it is very reassuring to report that in the case of Shannon LNG's proposed 16:14 terminal site nothing has had to be compromised on the marine design as the basics are ideal for an LNG terminal. In my experience I have seen no location having a better overall fit as an LNG receiving terminal. The proposed site and marine facilities as 16:14 described in the EIS volume 2 sections etc. are in every way compliant with SIGTTO guidelines.

The next **submission**: Windage has not been accounted for because the specific gravity of LNG is a lot lower 16:14 than oil so the ship runs a lot higher in the water. This was from the Kilcolgan Residents Association.

In **response**: Windage of the LNG tankers has been taken fully into account in the manoeuvring simulations 16:14 described in EIS volume 4. The simulation models contain the windage coefficients of the various ship sizes and the simulator can apply winds of varying strengths and from any direction. The LNG ship mooring

system as described in the EIS volume 4 appendix 3A took into account the windage area of the LNG ships and was designed for wind conditions far in excess of those under which a ship would be allowed to enter port and berth. 16:15

The next **submission**: The US GAO report to Congress states that the worst case scenario is a small hole in an LNG carrier's containment. This is from Kilcolgan Residents Association. 16:15

In **response**: The GAO report concerns potential terrorist attack on LNG ships and the consequence assessment of a credible worst case scenario has been carried out and reported in the EIS volume 4 appendix 3C. 16:15

The next **submission** is an objection claiming that an offshore location for a terminal would be safer than the onshore one proposed, from the Kilcolgan Residents Association. 16:16

In **response**: There is no indication that the proposed onshore terminal will not meet all the safety requirements of the Irish HSA. 16:16

The next **submission**: Concern over the impact of the jetty construction and its location on siltation and sand bank movements towards the southern shore of

Co. Clare. This submission was from Clare County Council.

In **response**: The construction and structure of the jetty will only involve open steel piles which will pose minimal obstruction to the existing tidal flow of the estuary waters. There will, therefore, be no influence to either the velocity or direction of the existing tidal currents in the estuary and no influence to conditions on the Co. Clare side of the estuary. 16:16 16:17

The next **submission**: Concern over the potential impact of the proposed development and the associated shipping movements on the SAC, this submission also from Clare County Council. 16:17

In **response**: The increase of up to 125 ships per year representing no more than 15% of the existing marine traffic is not considered significant. 16:17

My colleagues Stiofán Creaven and Simon Berrow will discuss this further.

The next **submission**: Concern other the effects of proposed LNG shipping activity on the water régime including any changes to temperature etc., a submission also from Clare County Council. 16:17

The increase of up to 125 ships per year representing

no more than 15% of the existing marine traffic is not considered significant. As stated in the EIS volume 4 appendix 11A-5 the ships will be coated with non-toxic tin-free hull paints and will not discharge water within the estuary. Operation of the LNG ships will have no effect on the temperature of the body of water within the estuary. 16:18

Before concluding I would like to turn to some oral submissions which we have heard and I would like to comment on them. Just give me one minute. I think we heard from Catriona Griffin today that there was an incident in Savannah where an LNG tanker left the berth requiring it to be evacuated for 36 hours I think was what was said. 16:18

I am very familiar with this incident. It occurred in March 2006. The ship was the Golar Freeze which was a 125,000 cubic metre ship. The berth at Elba Island in Savannah is very close and at right angles to the main channel into the port. A chemical carrier passed the bow of the LNG carrier at 14 knots, the bow wave from the chemical carrier impacted the bow of the LNG ship breaking some moorings and it moved 15 feet from the berth of the bow. The emergency disconnect couplings of the terminal's offloading arm prevented any release of either LNG or vapours and this was reported by the US Coast Guards main safety branch. The dock was shut down for 36 hours, i.e. the dock was shut down, the 16:19 16:19

facility was not evacuated; however, representatives from the Coast Guard and the LNG engineer from the Federal Energy Regulatory Commission investigated the incident. Commercial ship traffic was not affected by the shutdown. According to Georges Port authority: 16:20

> "We have seen no delays, it is business as usual."

So in other words what happened here was that a ship passed very close, affected the moorings of the LNG ship, the system built into the discharge arms operated correctly, stopped the discharge or cargo and disconnected the arms so all of the automatic systems worked perfectly and there was no release, no vapours and no evacuation. 16:20

MS. GRIFFIN: Could I respond to that, Mr. Inspector?

MR. MacINTYRE: Could I carry on?

INSPECTOR: Continue.

MR. MacINTYRE: Thank you. I would now like to address some questions submitted yesterday by Mr. David Robinson. The first question was: What is the worst case scenario for a spill of LNG in water that a Quantitative Risk Assessment (QRA) has been done by either the port authority, LNG companies or independent risk assessment? 16:21 16:21

Shannon LNG has carried out a major accident hazard

assessment for the LNG shipping activity which includes a consequence assessment of cargo release and fire evaluated against US Department of Energy Sandia National Laboratory Report 2004, Credible Worst Case Scenario Criteria. This was consistent with the Sandia methodology and covered all areas while the ship was in Irish waters and at the berth. The major hazard assessment is located in EIS volume 3 appendix 3C. 16:21

A notation to his question: If a proper full independent Quantitative Risk Assessment were to be done for a spill of LNG in water it would be for one fifth of the cargo which equates to 50,000 cubic metres of one tank of the five of the LNG carrier. 16:22

In response: The consequence assessment which was carried out by Shannon LNG employed the Sandia worst case scenario of half of one tank of a 125,000 cubic metre ship; in other words, 12,500 cubic metres, fully in line with the Sandia recommendation. 16:22

The next question: What would be the domino effect if an LNG pool fire were to occur that resulted from a one metre, five metre or twelve metre hole in the tank of an LNG carrier? 16:23

In response I would say there is no consensus of agreement within the industry with respect to whether or not a pool fire resulting from a hole in one tank

would lead to a domino effect loss of integrity of other tanks. The Sandia Report stated:

> "Cascading damage, multiple cargo tank failures due to brittle fracture with exposure to cryogenic liquid or fire induced damage to foam insulation was considered. Such releases were evaluated and while possible under certain conditions are not likely to involve more than two or three tanks for a single incident. Cascading events were analysed and are not expected to greatly increase not more than 20 or 30% the overall fire size or hazard ranges but will increase the expected fire duration." 16:23 16:24

A subsequent question: Given that an LNG pool fire burns at well 1,000 degrees Celsius and the LNG carrier is moored with ropes made of polypropylene, which have a low melting point, where would the burning LNG carried be carried by wind and tide? 16:24

In response: Not all LNG carriers employ synthetic mooring lines. Many employ mooring wires, although most wires do have nylon tails. During ship manoeuvring simulation exercises in the National Maritime College of Ireland (NMCI) at Ringaskiddy, Shannon LNG simulated the effects of wind and tide on an unrestricted and disabled LNG ship to determine the direction of drift it might adopt from an initial position on the berth. Different combinations of wind and tide were used and the results indicated that a disabled ship would in most cases drift in a north north west direction, i.e. towards the centre of the 16:24 16:25

estuary. This is referenced in EIS volume 4 appendix 3C section 4.

In accordance with industry recommendations and the requirements of most ports, all LNG ships will be required to rig steel fire wires at both ends of the vessel while berthed. One end of each fire wire is insured on board the ship while the other end is suspended at a suitable distance above the water so that it can be caught quickly and made fast on board the stand-by tug for emergency towage of the ship. 16:25 16:25

The next question: Is the deliberate ignition of any gas cloud on water being considered by the LNG companies or port authority? 16:26

I cannot speak for the port authority, but in response I would say no.

The next question says: Who will be responsible for ignition of the cloud and what domino effects are expected from this cloud ignition? That is not applicable. We have responded, no, that we would not attempt to ignite it. 16:26 16:26

A subsidiary question: Note, the Sandia Report 2004 makes a statement on page 46. This suggests that LNG vapour dispersion analysis should be conducted using site specific atmospheric conditions, location

topography and ship operations to assess adequately the potential areas and level of hazards to public safety and property. Risk mitigation measures such as development of procedures to quickly ignite the dispersion cloud and stem the leak should be considered if conditions exist that the cloud would impact critical areas. 16:27

In response: Shannon LNG would say that as the Sandia Report considered leaks from containment breaches of 0.5 metres or greater inferring even larger holes in both inner and outer hulls we would estimate at least four times as large, it would seem to Shannon LNG that the ability to effectively stem a leak appears remote. 16:27

The next question: Are you aware of the GOA report of the US Congress GOA 07-316, maritime security public safety consequences of a terrorist attack on a tanker carrying Liquefied Natural Gas. We need clarification it says. 16:28

In response: Yes, we are aware.

The next question in your risk assessment deliberations have you taken into account of the relationship between hull size and cascading tank failures. Hole size is an important parameter for modelling LNG spills because of its relationship to the duration of the event. Larger holes allow LNG to spill from the water more quickly resulting in large LNG pools and shorter duration 16:28

fires. Conversely, smaller holes could create longer duration fires. Cascading failure is important because it increases the overall spill volume and duration of the spill, page 11 of the above report.

16:28

In response: Yes, hole size as per Sandia Report criteria was considered in the consequence assessment reported in the EIS volume 4 appendix 3C. Note my previous response to question 3A for a comment on cascading tank failure.

16:29

The next question: In your risk assessment deliberations did you take into account that waves and wind will tend to tilt an LNG pool fire down wind increasing the heat hazard zone in that direction, page 12 of the above report.

16:29

In response: Yes, wind tilt is taken into account in the Sandia criteria and in our application of it. Sandia ignored waves and considered worst case flat calm conditions; therefore, waves have not been taken into account as there is no accepted method of modelling the effect of waves in a pool fire. However, as stated in the GAO report it is generally recognised that waves can inhibit the spread of an LNG pool keeping the pool size much smaller than it would be on a smooth surface and thereby reducing the size of the LNG pool fire.

16:29

16:30

I would now like to turn to a couple of questions or unanswered ones of Captain Coughlan and one which you, Mr. Inspector, requested regarding the impact of something like a fishing boat or a trawler on an LNG vessel. There was a study carried out by Germanish representatives in Germany some years ago. Some details of it are copied in the SIGTTO information paper 14 which is already in the record as it was submitted in the Kilcolgan residents submission and this estimated the displacement of ships and the speed they would have to be travelling at in order to penetrate both the outer hull, inner hull and containment system of an LNG ship. 16:30 16:31

If I give you some example here from this. This is the hull resistance of a 135,000 cubic metre LNG carrier, that a ship of displacement of 20,000 tonnes would have to hit the side of the ship at greater than 7.3 knots to reach the inner hull of the ship. There are details for larger sized ships as well. I think this indicates that any small vessel would not penetrate the hull. 16:31 16:31

I can relate to you my own personal experience of a new LNG ship just being delivered from a shipyard in Japan. It was of 135,000, about the same size, it was anchored outside the Port of Nagasaki on a fine morning, a Japanese fishing boat, equivalent to a large steel-hulled trawler returning from fishing, everybody asleep on autopilot, steamed straight into the side at 16:32

right angles. It penetrated the outer hull of the LNG ship and I would say that the deepest indentation was probably in the order of one foot or 300 millimetres. Given that the double hull structure is at least two metres thick it got nowhere near the inner hull. I am very familiar because I had to supervise the repair. 16:32

Also there were comments on the number of whale watching vessels and trips. In the EIS volume 2.3.3 Shannon LNG recorded that the level as we were investigating and found was approximately 500 trips per annum out of two ports in Co. Clare so it's approximately 500 trips per annum was what we got there. 16:33

16:33

Also a comment was made I think by Dr. Havens saying that LNG ships were denied access to all ports in America. I think following 9/11 the only port that was restricted was Boston and that was related to the fact that the planes which attacked the Twin Towers had originated from Boston so the only port that was restricted was Boston. 16:34

Two other questions which were I think raised regarding the HSA: Would a QRA of a leak from a ship with a capacity of 265,000 cubic metres and the consequences of such a leak be needed for the Local Authority in order for the Local Authority to produce an emergency plan? It is our understanding that a leak from a ship 16:34

of that size within port areas is considered non-credible. Given the statements which Captain Coughlan made, given what Sandia also says about the unlikelihood under port conditions of an accident causing release of cargo and that is agreed in the reports of FERC, the Federal Energy Regulatory Commission in the USA, they believe that the risk of release of cargo due to accidental events in port areas to be virtually non-credible. The only circumstance in which these large releases could take place would be the terrorist attack scenario. 16:35 16:35

I think, Mr. Inspector, what Sandia says is spills on water, it does not take into account where they occur, how they occur, it looks at spills on water and it clearly says that in applying their criteria you have to look at port specific conditions and as I think was said earlier today there is absolutely no doubt that in the wide oceans of the world the ships proceeding at high speed sometimes on crossing courses then it is credible. When you come into the controls in ports where ships are moving at slow speed, pilots on board, escort tugs, control zone around the ships, the collision event which could result in the half of a full tank release of cargo is non-credible unless you bring in the terrorist attack and Captain Coughlan has said that obviously if there was any terrorist threat of an elevated level then the ship would not be allowed into the port. He did not add, as I would, that if the 16:36 16:36 16:36

ship was already in it would be asked to leave immediately.

One further question was: Is it possible to moor another ship within the contour lines? This was referring to the shore contour lines from the QRA. As Captain Coughlan said we would agree that any other facility that was coming there, the position of the berth would be a certain distance from the LNG berth to maintain normal manoeuvring room for large ships and that that would possibly take it outside the edge of the contour line, but there is no restriction of industrial activity that we are aware of within the contour line. Certainly other ports in the world the division that I am familiar with is made on the basis of safety of manoeuvring and berthing of the two ships. It is not based on QRA criteria. 16:37 16:37 16:38

I think these are all the questions that I had to deal with and, therefore, in conclusion, Mr. Inspector, it is my view that the international regulations governing the construction, operation and maintenance of LNG ships, coupled with the regulations and instructions that will be applied by the Shannon Estuary Harbour Master and Pilot Superintendent, will ensure that the impact of the shipping activity will result in minimal risk to human beings or the environment and have minimal impact on other shipping activities. Thank you. 16:38 16:38

END OF SUBMISSION OF MR. MACINTYRE

INSPECTOR: Thank you, Mr. MacIntyre. It is 4:35, I think maybe we will take a five minute break at this stage. 16:39

(SHORT ADJOURNMENT)

16:39

THE HEARING RESUMED AFTER A SHORT ADJOURNMENT AS FOLLOWS.

INSPECTOR: Okay, it is ten to five so maybe we could resume our seats please. Mr. O'Neill, would you like to present your next speaker? 16:52

MR. O'NEILL: The next expert retained on behalf of Shannon LNG who is going to make a presentation to the hearing is Dr. Franks and he is going to deal with the Quantitative Risk Assessment carried out. 16:53

MR. ANDREW FRANKS ADDRESSED THE ORAL HEARING AS FOLLOWS

MR. FRANKS: Good afternoon, Mr. Inspector. Apologies for not introducing myself earlier when I addressed you. As counsel said my name is Andrew Paul Franks. I am going to try and précis my statement for you as much as I can in line with your guidance. 16:54

Starting with section 1 on qualifications and experience. I hold a Bachelor of Science Honours degree and Doctorate of Philosophy in Chemistry from Imperial College in London. Following successful completion of UK Engineering Council examinations and the design project for Institute of Chemical Engineers and submission of my training and experience report, I am also a Chartered Engineer with the UK Engineering Council and a member of the Institution of Chemical Engineers. 16:54 16:54

I am a Technical Director with Environmental Resources Management Ltd. I am an employee with that company. My main area of expertise is in the risk assessment, particularly the Quantitative Risk Assessment (QRA) of onshore major accident hazard facilities. I have been involved in the assessment of major hazards for over 19 years. My work has included involvement in risk assessment studies of a wide range of major accident hazard facilities, including those handling LNG. 16:55

I have also provided advice to regulators such as the UK Health and Safety Executive on matters relating to risk assessment of major accident hazards for the purposes of giving land use planning advice to local authorities. 16:55

I am going to skip through the next couple of paragraphs, Sir. Suffice it to say that I started out with a couple of years in the chemical industry in development. I moved to what was the major hazards and 16:55 transport group in the Safety and Reliability Directorate in the UK Atomic Energy Authority. Subsequently, I moved to the Health and Safety Executive in 1993 where I was a specialist inspector in the Major Hazards Assessment Unit. Just to go through 16:56 this paragraph.

Here my duties included risk assessment of a variety of onshore major accident hazard sites for the purposes of giving land use planning advice to local authorities in 16:56 the UK. I was also involved in managing research projects and assessing the contents of safety reports as required by the Seveso Directive. This included assessment of safety reports for a variety of natural gas processing and storage establishments including LNG 16:56 peak shaving facilities.

As regards the next paragraph, Mr. Inspector, suffice it to say that I moved out of the HSE in 1997, worked

for a couple of different consultancy firms where again I continued to be active in the major hazards risk assessment area in terms of conducting QRAs, giving advice to regulators, providing lectures on MSc courses and conducting research projects for the HSE. 16:57

The next paragraph on page 3 now, the second paragraph down starting "my experience". My experience includes managing the production of the Seveso pre-construction safety report for the Dragon LNG Terminal in the UK. 16:57 I have also acted as technical advisor and reviewer for risk assessments of LNG import terminals in the US. I was Project Manager for the safety and QRA studies performed for the proposed Teesside LNG import terminal in the northeast of England. Just to clarify, Sir, 16:57 that's not the gas port that we have heard about on Teesside already, this is an LNG import terminal similar to the one that we are discussing at the moment.

16:57

We then have some details about ERM in the next couple of paragraphs which I won't bother to read, Sir. Moving on towards the bottom of the page: The purpose of my evidence is to provide an overview of the Quantitative Risk Assessment of the proposed terminal 16:58 and the results obtained. My principal points of evidence will cover the methodology used in the QRA; the risk results obtained; the assessment of how the risk results compare with the HSA's criteria; responses

to various submissions; and finally my conclusions.

Section 2: ERM's involvement in the project, introduction. ERM was commissioned by Shannon LNG to perform Quantitative Risk Assessment studies of the proposed terminal. This resulted in production of the QRA report that was submitted to the Health and Safety Authority at the time the planning application was made to the Board. I was the ERM Project Director for the work with overall responsibility for technical direction in terms of methodology and assumptions used and technical quality of the final report of which I was the principal author. I was involved in discussions regarding the work with Shannon LNG and with the HSA representative. I was also the principal author of appendix 3E of the EIS that presents a summary of the QRA. 16:58 16:59 16:59

This brief presents a summary of the QRA and appendix 3 of the EIS. The QRA is described in considerably greater detail in the ERM QRA report that was submitted to the HSA. 16:59

Section 2.1.1 explains some of the technical terminology that were used in risk assessment. I don't propose to read it out, it is there if people think it would be useful and they are not familiar with these terms. 16:59

There is just one point I would like to clarify with regard to the paragraphs on page 5, Sir, to do with risk assessment and Quantitative Risk Assessment. I think we need to be clear that risk assessment considers both the consequences and likelihood of events. It doesn't just consider the likelihood on its own, the consequence analysis is also a significant part of the assessment. Having said that, I will move on to page 7 starting to read now section 2.2 on methodology. 17:00

The methodology used is summarised in appendix 3E of the EIS. The HSA has listed a number of reliable sources of information about QRA methodology. The Dutch Purple Book, the US Centre for Chemical Process Safety and the UK Health and Safety Executive. These reliable sources of information are referred to in the Health and Safety Authority's document concerning the Kilkenny Grassland Fertiliser's document that was discussed this morning when Mr. Conneely was with us. 17:01 As Mr. Conneely himself made clear and I just want to reiterate although the HSA document referred to concerns a specific fertiliser facility, appendix 2 of that document sets out the HSA's policy and technical approach to QRA for land use planning in general. 17:01 Appendix 2 is not specific to any major hazard installation or dangerous substance.

In determining which of the sources listed by the HSA

would be suitable for this study, it was noted that the HSA considers the risk of people receiving a dangerous dose when considering land use planning advice as distinct from a fatality. A dangerous dose corresponds to approximately a 1% chance of fatality. Of the sources listed, only the UK Health and Safety Executive approach uses dangerous dose and hence the UK Health and Safety Executive approach has been adopted. In addition, a series of meetings were held with the HSA at which the methodology was presented and discussed in detail. 17:02 17:02

When performing a risk assessment it is important to consider the following questions: Risk from what, risk of what and risk to what or to who. The ERM study has considered the risk from the proposed LNG terminal, including the unloading of LNG from ships, the storage of LNG in tanks and the process of turning the LNG back into natural gas. 17:02

In order to provide a complete picture of the risk the studies has also addressed the risks from equipment associated with the connection between the terminal and the new pipeline, the so called above ground installation or AGI, and the new pipeline itself, even though these do not form part of the planning application for the terminal. The studies have focused on the risk from potential major accidents at the terminal, AGI and pipeline as opposed to day to day 17:03 17:03

occupational accidents like slips, trips and falls. In line with the HSA's approach the study has calculated the risk of people receiving a dangerous dose. The assessment considers the risk to people in the vicinity of the proposed facilities who might be affected by major accidents. 17:03

Section 2.2.1, potential major accidents and their likelihood. The Health and Safety Executive approach defines the major accident scenarios to be addressed in the QRA, together with the associated likelihood or frequency. In broad terms the major accident hazards associated with this type of installation involve leakage of LNG or natural gas from the equipment that is meant to contain it. Leaks of various sizes have been considered from small to very large. Credit has been given where appropriate for those systems that Shannon intends to put in place to detect leaks to minimise the amount of material that leaks out and to handle the material that may escape. These measures were described at length by both Mr. Bowdoin and Mr. Vinecombe yesterday. The QRA also addresses the local possibility scenarios located with failure of the safety systems. A summary list of the major accident scenarios considered was presented in table 1 of appendix 3E of the EIS and is reproduced in table 2.1 below. Table 2.1 also summarises the measures that will be provided at the terminal to prevent major accidents or mitigate their consequences. Table 2.1 is 17:04 17:04 17:04

there on page 9, I won't go through it since it is copied straight out of the EIS.

The bottom of page 9 section 2.2.2, major accident consequences. The only thing I will say on that paragraph is that we used the commercially available DNV PHAST software as recognised by the HSA as being suitable for the calculation of consequences of potential major accidents. 17:05

Going over the page, we used ERM's Viewrisk software to calculate risks. This is software that has been developed under joint funding with the UK Health and Safety Executive. 17:05

Section 2.2.4 deals with the assessment of results. The first part of this section goes through risk criteria as have been established by the HSA and since Mr. Conneely explained these this morning all I will do is highlight the second bullet point in this section which is that the individual risk of dangerous dose or worse should not exceed one in a million per year at the nearest residential property and then below that we have the three bullets explaining the zone 1, 2 and 3 risk levels that Mr. Conneely talked to us about this morning. 17:06 17:06

Going on to page 11 we see there in table 2.2 acceptable land uses within risk zones. This is a

direct copy from the HSA document. It was presented by Mr. Conneely this morning so I won't go through it again now.

The paragraph below the table: The individual risk of dangerous dose for a person at the nearest residential property has been calculated to be 3 in ten million per year. This is below the criterion value set by the HSA. The individual risk of dangerous dose contours for hypothetical house residents are displayed in figure 2.1 which is over the page on page 12. This is the same figure that Mr. Conneely showed us this morning only unfortunately when he only showed it his power point it had become stretched so this is the figure as it appears in the QRA report. We can see there the red, blue and green lines as Mr. Conneely explained denoting the boundaries of the different zones. 17:06 17:07 17:07

Hence the HSA's zone 1 referred to in table 2.2 would be the area encompassed by the red lines. Zone 2 would be the region between the red and blue lines and zone 3 would be the area between the blue and green lines. As can be seen from figure 2.1 land use within the zones is predominantly agricultural. There are no land uses that would fall in the 'advise against' category as listed in table 2.2. 17:07 17:08

At the time of writing the HSA was still in the process

of developing criteria for societal risk. The societal risk results for the Shannon LNG facilities have, therefore, been compared with criteria used in a number of countries around the world including the Netherlands, the UK and Hong Kong. It was found that the societal risk results met all of these criteria. 17:08

The HSA conducted their own independent review of the ERM QRA report as we heard this morning and subsequently responded to An Bord Pleanála that it did not advise against the granting of planning permission in the context of major accident hazards. Clearly we heard from Mr. Conneely this morning that they are looking at new information that has been provided to them. It is our understanding that this is the advice that they are giving until such time as it may or may not be changed. I have simply appended the letter forwarded on from the Board to the back of my statement. 17:08 17:09

I would like to go on now to section 3 and deal with responses to submissions to An Bord Pleanála. A number of safety related concerns has been expressed in the submissions made to the Board. In several instances the same concern was raised in a number of submissions. I understand that the QRA has been reviewed by the Health and Safety Authority. In addition, I have read the submission made to the Board by the HSA on 9 January 2008. I am advised that the HSA is the 17:09

competent authority designated under the Seveso II Directive while the board is a planning authority within the meaning of article 12 of that Directive. Notwithstanding the jurisdiction of the HSA as the competent authority for the purposes of the Seveso II Directive, many submissions have been received by the Board in relation to the QRA. Whilst the Board is the planning authority as opposed to the competent authority for the purposes of the Seveso II Directive, in order to assist the Board in all its deliberations the developer has provided responses to those submissions in relation to the QRA. 17:10 17:10

Section 3.1. There are a number of submissions to the effect that there has been insufficient QRA, that the QRA does not fully acknowledge the threat to residents of a major accident in submissions 2, 3, 4, 15 and 34. The response is that the QRA of the terminal has been comprehensive, addressing the facility from the offloading of LNG through the unloading arms through storage in the tanks, regasification, handling of boil-off gas and export of high pressure gas by pipeline. The major accident hazards considered were as listed in appendix 3E table 1 of the EIS. The methodology and data used have been obtained from authoritative sources, hence the QRA of the terminal is sufficient. 17:10 17:11 17:11

The next submission in 3.2. A number of submissions

highlighted the 12.4 kilometre vapour cloud range that is mentioned in the report. The maximum range for an ignited vapour cloud is 12.4 kilometres. One submission states that this was buried in the QRA. The QRA gives the maximum distance to lower flammable of 12.4 kilometres, but does not state how far the cloud would travel beyond this distance before it meets the upper flammable limit. There was also another comment that an early warning system should be implemented within a 12.4 kilometre radius, together with provision of information to residents on how to react, these being made in numbers 3, 14, 54, item 3 and item 41. 17:12 17:12

Response: The zones defined by the HSA for the purposes of giving land use planning advice are based on an assessment of the risk arising from a whole range of potential accidents of different sizes rather than a single hazard range associated with a particular event. The zones calculated by ERM are shown in figure 2.1 where it can be seen that the extent of the zones is much less than 12.4 kilometres. The calculated potential maximum range to the lower flammable limit of a cloud of LNG vapour is 12.4 kilometres. This is clearly stated in section 3.2.2 of the QRA report. This potential maximum range relates to the following chain of events: 17:12 17:13

Firstly, a failure of a full containment storage tank such that both the outer reinforced concrete and inner

nickel steel vessels are severely damaged simultaneously resulting in a rapid loss of the entire tank contents. This has a predicted frequency of once in 5 million years and is, therefore, highly improbable. 17:13

Next: In spite of the energy required to do this kind of damage to the tank, the failure occurs without igniting the tank contents;

17:13

The failure occurs while the tank is full; the failure occurs during the worst weather conditions from the point of view of dispersion of the vapour, that is stable low wind speed weather conditions; also that the cloud grows to the maximum range without being ignited, 17:14 that is in travelling that distance the cloud does not encounter an ignition source such as a car engine, cigarette, fire and so on that would otherwise cause it to catch fire, then ignites when it gets to its fullest extent. 17:14

The comment in submission 54 item 3 regarding the distance to the upper flammable limit reflects a misunderstanding of the science involved. For any given LNG vapour cloud the distance to the upper 17:14 flammable limit is always less than the distance to the lower flammable limit.

The Seveso II legislation requires the operator of a

major accident hazard establishment to provide information to people on the recommendation action to take in the event of a major accident. The information has to be provide to all those who would habitually be present within a specified area. The operator has to 17:15 distribute this information prior to the facility becoming operational.

The specified area is defined in Statutory Instrument 74 of 2006, the regulations that implement the Seveso II Directive is defined as: 17:15

> "That area which is likely to be affected by a major accident at the establishment."

The specified area is determined by the operator of the 17:15 establishment in agreement with the HSA. If agreement cannot be reached then the specified area is set by the HSA. The specified area is distinct from the land use planning zones described above in section 2.2.4.

17:15

The HSA has published guidance on the HSA's approach to setting the specified area. The HSA's approach is to set the specified area on the basis of the analysis of the consequences of a selected event. The events considered are "credible major accidents". 17:16

The HSA guidance states:

> "The HSA has decided to take a consequence based approach using end points that would warn those habitually

> in the area who would be potentially able to suffer harm even though that risk could be extremely low.
>
> At the same time the authority recognises that there is a need not to set an impracticably large area."

17:16

In view of the HSA's focus on credible major accidents and the recognised need not to set an Impracticably large area, it is my opinion that the potential maximum range of 12.4 kilometres would not form a sound basis for the specified area because the event to which it relates is not credible but highly improbable as described above. Should planning permission be granted it will be necessary for Shannon LNG to enter into a dialogue with the HSA in order to reach agreement on a sound basis for the setting of the specified area.

17:16

17:17

I then go on to give a discussion of the emergency plan requirements that will also be on both Shannon LNG and the local competent authority, but since Mr. Conneely touched on these this morning I won't read that out. Suffice it to say that these plans have to be in place before the facility comes operational, assuming that permission is granted.

17:17

I just want to highlight, though, the local competent authority that puts together the external emergency plan is required to consult with a number of bodies and groups during preparation of that plan including members of the public.

17:17

Moving on to No. 3.3. Submission: The Shannon LNG model has been based on HSA safety guidelines, but there is no similar industry in Ireland to compare with. Use of the HSA document in Grassland Fertilisers Kilkenny is inappropriate because the chemicals handled are different. These were in submissions 3, 54 and item 7(e). 17:18

I think Mr. Conneely actually dealt with the second of those points regarding the Kilkenny Grassland Fertilisers document. I will just try and deal with the first which is that the HSA's criteria are stated in terms of absolute numerical values of individual risks and are therefore independent of the establishment under consideration. The criteria do not rely on a comparison between one facility and another. 17:18

Moving on to 3.4. Submission: Require assurances that international best practice will be applied in the area of safety. This was highlighted in a number of submissions, the numbers of which are listed there. Mr. Bowdoin and Mr. Vinecombe have covered design of the facility at some length so I won't cover that just to note that in response Shannon LNG has indicated that the European standard 1473 of 2007 will be applied to the design. This is a standard that addresses safety and environmental requirements as well as engineering aspects of the various systems and components that will 17:18 17:19

make up the plant.

As we have already heard the terminal will fall within the scope of the Seveso II Directive. I then go on to outline some of the requirements that would be placed on Shannon LNG as a result of that, but since many of these were covered again by Mr. Conneely this morning I won't go through them all. Suffice it to say or just to re-emphasise that Shannon LNG would be required to submit a pre-construction safety report for submission to the HSA several months before starting construction and as Mr. Conneely remarked they would not be permitted to start construction until the HSA were satisfied with that report. Similarly, there is also a pre-operation safety report that is submitted to the HSA several months before starting operation and similarly operation could not start until HSA had communicated its satisfaction with that report. 17:19 17:20 17:20

I give some information at the bottom of page 18 about what safety reports are required to contain, I won't go through that. I will just move on over the page to No. 3.5. There are a number of submissions that indicated views such as that the terminal is not fully guaranteed safe, that there is a threat of a major accident or that no matter how low the risk, there is still a risk, that there is a high probability of a major accident or that no matter how good the track record an accident can still happen. In response 17:20 17:21

I would just like to say that the risk of a major accident at the proposed terminal is very low. The term 'fully guaranteed safe' cannot be applied to any operation which presents a hazard. Some everyday examples including driving, flying, boiling the kettle as well as oil refining, pharmaceutical manufacture or airports' operations. Thus, the correct criterion is not one of 'no risk' or 'fully guaranteed safe' as this level of assurance does not exist for any activity. Instead, the correct criterion for evaluation is whether or not the activity in question has a sufficiently low level of risk that it can be deemed acceptable. The rationale behind the HSA risk criteria is to ensure that the risk from new facilities are very low relative to those experienced by people in everyday life. The QRA performed demonstrates that the Shannon LNG meets the HSA criteria as stated in appendix 3 of the EIS. 17:21 17:21 17:22

No. 3.6 relates to sterilisation of land and impact on future development. Again this is something that came up with Mr. Conneely this morning and I think he answered it. All I will say is that the land use planning zones that are defined by HSA don't constitute sterilisation zones, they are land use planning advice zones. It's not that all future development is excluded from those zones. 17:22 17:22

No. 3.7, a submission by the Kilcolgan Residents

Association. The submission states that one obvious and questionable claim in the QRA undertaken by the developer can be seen where only one of the four LNG tanks is covered by the inner zone contour. That is shown in figure 2.1 in my statement. This means using the criteria that I will put in table 2.2 that it would be acceptable to build residential houses up against the remaining three LNG storage tanks even if the first tank leaks. This does not make sense and can only lead to the conclusion that the contours have been unrealistically tightened so as not to encompass current residential areas. 17:23 17:23

Response: A contour a line drawn to join together the points where the risk calculation shows that the risk is the same. The contours reflect the results of the risk calculation and the risk levels that the HSA uses to set land use planning zones. They have not been unrealistically tightened. The location of the zone 1 contour, the red line in figure 2.1, coincides with the location of the impoundment basin used to collect any accidental releases from equipment, not the tanks per se. The likelihood of leaks from the full containment tanks is so low that they do not give rise to risk levels at the zone 1 level. The contours have not been drawn to reflect pragmatic considerations such as who owns which piece of land. 17:23 17:24 17:24

MR. McELLIGOTT: Mr. Inspector, can I ask a question on that.

MR. FRANKS: I would like to finish, if I may.

INSPECTOR: Press on.

MR. McELLIGOTT: It's a very important question just on that specific point. 17:24

INSPECTOR: If you need clarification maybe you can deal with it.

MR. McELLIGOTT: You say there is an impoundment area basin used to collect any accidental releases so that covers the zone 1 area, but you have two contours, one is in the lower part on page 12, but the other bit is near where the ship is and there is no impoundment area around the ship so how can the red contour change just where the ship is. 17:24 17:25

MR. FRANKS: Mr. Inspector, I am happy to explain that. I was only dealing with the red contour around the impoundment basin because the question related to that contour. The red contour around the jetty is associated with releases from the unloading operation. I hope that clarifies. 17:25

MR. McELLIGOTT: No, it actually doesn't because the argument for one does not stand up for the other. If you are standing on the jetty -- from the ship there where the red contour is, at the jetty, what risk of death is going to change if you go another to or three feet 17:25

beyond that red point, whether you are in the blue area or just right on the red dot, there is nothing that changes that, you are dead if you are out there anyway because there is no impoundment and it will go around in a big flame so it depends on wind direction and 17:26
everything like what Dr. Havens was showing in his video. That's on water, we saw that it goes in the direction of the wind so where around that red contour around the jetty, if there is a spill and that touches the water, that you can say that you are safer one foot 17:26
after that red zone, do you see what I am getting at?

MR. FRANKS: Not entirely. Just to try and explain. The spills in the process area, this is on the land side now, that go into the impoundment basin has been modelled as being 17:26
confined by that impoundment basin so that's the red zone that we are talking about near the tanks that was the subject of the question. The other red zone that Mr. McElligott has highlighted is at the jetty and this is around the unloading arms that are used to convey 17:26
the LNG from the ship on to the land. Now at that location the spills have been modelled as falling on to the water and being completely unconfined and they are subject to the variation of wind direction and wind speed and all of that is modelled in the QRA producing 17:27
the risk contours that you can see. Just to remind you these are not risk of death contours, these are the risk of receiving a dangerous dose.

MR. McELLIGOTT: Could one of the LNG

experts answer that question.

MR. FRANKS: Could you repeat the question?

MR. McELLIGOTT: What I am trying to say is the risks around the jetty area, if there is a spill, how can you determine that the risk of injury is any way different between the red contour and the blue contour, for example what we saw on the video yesterday, how can that change. If you are around there anyway you are either frozen or you are dead, I don't understand how that -- okay, the land based one you used the argument of an impoundment area, but up there at the jetty there is no impoundment area and for 50 cubic metres you saw how big an explosion there was, I don't understand how you can calculate the risk there? 17:27 17:28 17:28

MR. FRANKS: The process involves first of all calculating the leakage out of the unloading arms should an accident occur. We then look at the spreading of the pool on the water, how far it spreads, we look at the size of the fire if it ignites and we look at the effects that that could have in terms of the likelihood of receiving a dangerous dose all around that fire. Now, in terms of the way the contours are drawn, clearly the amount of heat that you receive from the fire, like the one we saw in the video, depends on how close you are. If you are close then you may well be within the range to get 17:28 17:28

a dangerous dose and once you get beyond a certain point you will be outside the range to get a dangerous dose and therefore the risk falls off as a function of distance and that's why you go from the red to the blue to the green contours. These aren't stepped down from one to the other, the risk falls off as a kind of curve and these contours are just drawn at those locations where the correct risk value occurs. 17:29

MR. McELLIGOTT: May I ask again could one of your LNG experts explain the logic you just applied there, you are doing the probabilities, but I would like to see one of the LNG experts explain that from Shannon LNG, there is a difference. 17:29

INSPECTOR: Do you understand there are two centres of higher risk? 17:29

MR. McELLIGOTT: Yes.

INSPECTOR: Marked by the red and as you get away from them the level of risk declines. 17:30

MR. McELLIGOTT: Yes, but if you look even at that contour the ship is longer, the ship goes in from the red to the blue so if you are standing on the ship ...(INTERJECTION)

INSPECTOR: You are talking about the unloading arms which are at the centre of the ship or directly in line with the jetty and that's where the highest area of risk is and that's why the circle is centred at that point. 17:30

MR. McELLIGOTT: Yes, but if there is a vapour leak you cannot predict where it is going to go so I can't understand how it is that small, that's my problem.

MR. FRANKS: That's exactly what we do, Mr. Inspector, we predict the size of the leak, the spread of the leak, the size of the fire, we model all of these consequences within the QRA for different sizes of events as well. 17:30

INSPECTOR: You take into account things like wind? 17:31

MR. FRANKS: And wind direction yes.

INSPECTOR: You are not happy with that?

MR. McELLIGOTT: Not at all. 17:31

INSPECTOR: I think we will just have to leave it.

MR. FRANKS: Perhaps I will carry on with this statement, Sir.

There was another submission again from Kilcolgan Residents Association where it was stated that misapplication of risk assessment recently has become popular on the international front to apply risk assessment to justify otherwise poor decisions not necessarily in the best interests of the public or the country. Risk assessment can be a very unwise tool to force the will of a powerful few on the uninformed public. One factor signalling some poor applications of risk assessment is the comparison to other risks 17:31 17:31

that in a technical reality are not really related especially as to consequences. Some consequences are so great that no matter what the probability of the risks it cannot be justified, especially if economic benefit to the decision makers is actually driving the poor application of this tool. There are further comments made in the submission about who is liable if the risk assessment turns out to be wrong and so on and so forth. 17:32

In response I would like to say that there has been no misapplication of risk assessment in this case. The submission of the QRA was required by the HSA; therefore, demonstrating the HSA considered the application of QRA to be appropriate in this context. QRA has been applied to onshore major accident hazard establishments for over 20 years. The QRA data has used data and methods obtained from recognised authoritative sources. The QRA has used models that are widely accepted as industry standard and are considered to be suitable for this purpose. The QRA report has been subject to independent scrutiny by the HSA who accept it demonstrates that the HSA criteria at such establishments are met at least until we hear otherwise from Mr. Conneely. 17:32 17:33

The QRA results have been compared with risk criteria established by the HSA and establishing these criteria the HSA has taken the view that the risk from hazards

with potentially major consequences can be considered acceptable if the likelihood of these consequences being realised is very low. Just to note finally that neither ERM nor Shannon LNG is the decision maker in this process. 17:33

The next submission No. 3.9 was that pipeline accidents have not been included in the QRA again by the Kilcolgan Residents Association. I think I have already dealt with this in what I said about the scope 17:33
of the work we did initially, but just to re-emphasise that an initial assessment of the risk from the pipeline has been conducted as described in section 6.4.3 of the QRA report. We have also covered what is called the Above Ground Installation which is the 17:34
equipment associated with the terminus of the pipeline within the site boundary and part of the pipeline that is within the site boundary and that's described in section 6.4.2 of the QRA report. 17:34

Another submission 3.10 that the flight path of aircraft and the dangers from Shannon airport, again raised by the Kilcolgan Residents Association, their item No. 69. The Irish Aviation Authority has indicated in a written letter to Arup that it has no 17:34
observations to make on Shannon LNG's proposals. This implies that the risk from aircraft crashes on to the proposed terminal are not significant. The next submission, 3.11: What's the thermal flux level that

An Bord Pleanála would determine as acceptable, is it 1.5 kW/m^2.

The response: The HSA judges the acceptability of proposed major accident hazard establishment in terms of the risk of an individual receiving a dangerous dose rather than a distance to a specified level of thermal flux. Dangerous dose for a thermal radiation is 1,000 thermal dose units as specified in the HSA document. 17:35

Just to mention that thermal dose is a function both of the thermal radiation flux and also the time for which a person is exposed. Dangerous dose equates to a 1% chance of fatality. The HSA specifies an exposure duration of 75 seconds from which it can be calculated that the thermal flux required to give a dangerous dose is 7 kW/m^2. 17:35

The next submission also by Kilcolgan Residents Association that An Bord Pleanála should take account of the Buncefield report. Our response: Consideration of the Buncefield report in the context of land use planning should take into account the significant difference between the Buncefield site and the proposed Shannon LNG facility as well as the differences between the dangerous substances handled at the two establishments. The incident occurred in December 2005 at the Hertfordshire Oil Storage Ltd. petroleum storage depot near Buncefield in the UK and involved an 17:36

explosion and major fire. The explosion caused extensive damage to nearby buildings; the subsequent fires involved over 20 large storage tanks containing petroleum products.

17:36

The Buncefield depot stored petroleum products in conventional single containment tanks located within bunds. The proposed Shannon LNG will store LNG in full containment tanks where the outer concrete tank is designed to contain any accidental spillage from the inner nickel steel tank. The two establishments are, therefore, very different in terms of the substances handled and the tanks used for storage.

17:37

The incident involved prolonged overfill of the storage tank that was being filled with petroleum at relatively high rates from a pipeline. The overflowing liquid cascaded down the outside of the tank causing the liquid to break into droplets and evaporate. The resulting vapour formed a dense low lying cloud that spread off site and eventually ignited.

17:37

With regard to the proposed Shannon LNG Terminal, in the unlikely even that the inner tank was overfilled liquid would overflow into the outer concrete tank and be contained preventing formation of a vapour cloud. The two establishments are, therefore, very different in terms of the consequences of overfilling a tank.

17:37

The overflowing of the tank at Buncefield went undetected for around 30 minutes before being observed by personnel. The Buncefield storage facilities were not provided with flammable gas detectors that might have given early warning of a problem. The Shannon LNG terminal will be provided with flammable gas and low temperature detectors to monitor for potentially hazardous conditions arising from LNG spills or gas leaks. 17:38

When the cloud produced at Buncefield ignited an explosion occurred. The mechanism of the explosion at Buncefield is not yet fully understood. Initial reports have suggested possible mechanisms to explain the observations, but no definitive conclusions have been reached. More research is required before a definitive answer can be provided. 17:38

The Buncefield event also caused the Health and Safety Executive to revisit its policy for giving land use planning advice to local authorities concerning proposals for development in a vicinity of large petroleum storage sites. The changes included a revision of the type of development that the Executive would advise against in the innermost land use planning zone. Under its previous policy the Executive would not have advised against small housing developments, retail developments or offices in the innermost zone. Under the revised policy the Executive would advise 17:39 17:39

against all housing, retail or office development in the innermost zone; hence the revised Health and Safety Executive policy is now more like the policy already applied in Ireland by the HSA where HSA policy is already to advise against residential, office and retail developments in the innermost zone and reference to table 2.2. 17:39

3.13. Submission: Information and statistics on accidents and hazardous incidents at existing LNG plants around the world should be made available so that the risks from the processes planned for this site can be assessed and the safe distance from the plant to the existing dwellings can be determined. This was raised in submission 49 which I think was from An Taisce. 17:40 17:40

Response: As described in appendix 3E of the EIS, the QRA performed by ERM considers the likelihood of potential major accidents at the terminal and their consequences. This information has then been used to calculate risks. The risk results have then been compared with acceptability criteria established by the HSA. It has been shown that the HSA's criteria are met. 17:40 17:40

No. 3.14. Submission: It is unclear how the minimum safety distances required under the EC (Control of Major Accident Hazards Involving Dangerous Substances

Regulations 2006) will impact on the surrounding properties and land use and marine use in the administrative area of Clare. Just to note that those regulations referred to are the Irish implementation of the Seveso II Directive. This was raised in submission 55. The response is: That the HSA advises Local Authorities on proposals for the development in the vicinity of major accident hazard establishments using the framework presented in table 2.2. The zones referred to this table have been calculated by ERM and are shown in figure 2.1. These zones do not impinge on land in the administrative area of Clare and therefore there should be no impact on land use in Clare. 17:41 17:41

Before I conclude, Mr. Inspector, there were a couple of questions which have come up throughout sessions this week that I think I should try and cover. First I just want to address a couple of the questions that were brought up by Mr. Robinson in his statement. My colleagues will deal with some of the other questions. 17:41 17:42

Firstly, Mr. Robinson's question 6(a): Do you agree with HSE confirmation that LNG has two properties that are not fully understood as follows:
(a) Rapid Phase Transition. This is a phenomenon when LNG is filled and mixed with water causing flameless explosions that have been observed to damage surrounding structures. Computer modelling predicts larger explosions than are predicted using physical 17:42

test spills of smaller quantities of LNG on to water.

There was an attachment to Mr. Robinson's statement from the Society of Petroleum Engineers web article on the latest developments in Rapid Phase Transition modelling. The second part of question 6 will be dealt with by one of my colleagues. 17:42

Response: In order to give a position on the HSE confirmation referred to, it would be necessary to see the HSE document from which the information is taken so as to place it in its proper context. The Rapid Phase Transition phenomenon is not unknown and is referred to in the ERM QRA report in section 1.2.4 which states -- in fact, I won't read it out, Sir. Suffice it to say that we recognise that it happens, it's a known phenomenon, but simply just to refer you to the bottom part of that quotation from the report where we say that: 17:43 17:43

> "Rapid phase changes have not resulted in any known major incidents involving LNG. In view of this and the fact that the jetty structure for the proposed facility is relatively open, not involving any solid walls against the side of the ship, RPTs have not been modelled in the QRA." 17:43

17:44

The paper attached by Mr. Robinson describes a series of occasions when RPTs have been observed, some of which are accidents and some of which were experiments. None of the reported accidents caused more than minor

localised damage supporting the view taken in the QRA. None of the accidental RPTs described resulted in escalation to give further leakage of LNG. The paper goes on to give a brief description of two models that have been developed to analyse the RPT phenomenon. The 17:44
first model, the one highlighted by Mr. Robinson, is reported to "give values of energy orders of magnitude greater than those observed in large scale experiments". Discrepancies between the predictions of models and experimental observations indicate that the 17:44
model is giving incorrect predictions and therefore requires further development, not that there is some hitherto unobserved phenomenon waiting to be discovered. For this reason the paper describes this particular model as unsuitable for use in RPT risk 17:44
assessments.

Mr. Robinson in question 8 on his statement also said that: In our case in Milford Haven the HSE have used 5 kW/m^2 as safe for the public. The HSE quote an 17:45
OFFSHORE report (Human Vulnerability to thermal radiation offshore) as evidence that this level of thermal radiation is safe for the public. He then goes on to say people offshore have protection from clothing and safe refuges and so on and why should this apply to 17:45
the public.

Just in response: First I would like to say it's long established HSE, that's the Health and Safety

Executive, policy to use the dangerous dose criterion for land use planning assessments and in such cases the HSE doesn't use a thermal radiation flux of 5 kW/m^2. The report referred to by Mr. Robinson discusses a range of sources of information on the effects of 17:45
thermal radiation and gives a value of 1000 thermal dose units as equivalent to about one to five likelihood of fatality. This is consistent with the dangerous dose the HSE and the HSA uses in land use planning assessments. 17:46

Furthermore, this report is drawn on sources that were originally written in the concepts of onshore major hazards, specifically the references to Hymes, Hymes, Boydell and Prescott (1994); Hymes, Boydell and 17:46
Prescott 1996 and Rew 96. In other words, the long standing thermal radiation dose criterion employed by the HSE in land use planning assessments were used to establish criterion for workers off shore and not the other way around. Although the report discusses a 17:46
range of thermal radiation flux values and their effects, including 5 kW/m^2 it doesn't propose the use of 5kW/m^2 as a criterion.

There was also a comment on the back page of 17:46
Mr. Robinson's statement where he says that finally I have heard it said that the probability of LNG accidents are so remote that it's not worth worrying about. I am not sure where Mr. Robinson heard the

comment, but I would just like to say that neither appendix 3 of the EIS summarised in the QRA, nor the QRA report itself, or to my knowledge any statement by Shannon LNG makes such a comment. The conclusion of the QRA is that the proposed establishment will meet the risk criteria established by the HSA. 17:47

There were also some questions that came up in the session with Mr. Conneely this morning. Some of these I will try and clarify, some of them will be covered by colleagues. There was one issue over the pipeline and the extent to which it is covered by the QRA. I hope I have addressed that now. If you think further clarification is required I would be happy to provide that. 17:47

There was also some discussion about the electrical power lines and whether they should be over ground or under ground and what the effect would be on the QRA. In my view, Mr. Inspector, I think the effects on the QRA would be very small indeed and not really measurable. 17:48

There was also something raised about an error in the QRA regarding the occurrence of the hole and this referred to a table of data in the back of the QRA report where a value of 5 times ten to the minus 8 for a storage tank failure couldn't be found, I think it was Dr. Koopman if I remember correctly, and therefore 17:48

the conclusion was formed that we haven't actually used that value in the QRA and there, therefore, had been an error. In fact the five times 10 to the minus 8 value is there in the table, it's in a different column to the one referred to. I should say that's not an error on Dr. Koopman's part, that's an error on our part in terms of when we cut and paste the data into the tables from the spreadsheets and I apologise for the confusion, but just to reiterate there is no error in the QRA, the five to the minus eight value that has been referred to is actually used. 17:49 17:49

We have discussed the issue of these red lines and their location.

17:49

Finally to address my conclusion, Mr. Inspector. Shannon LNG was required to submit a QRA report to the HSA. This requirement arises from the Seveso II Directive. Under this legislation the HSA as the central competent authority provides land use planning advice to local authorities or the Board in respect of applications for new major accident hazard establishments or developments in the vicinity of existing major accident hazard facilities. As described in appendix 3E of the EIS a QRA of the proposed Shannon LNG Terminal has been performed by ERM. The QRA of the terminal has been comprehensive, addressing the facility from the offloading of LNG through the unloading arms, storage tanks, 17:49 17:50

regasification, handling of boil-off gas and export of high pressure gas by pipeline. The major accident hazards considered were listed in table 3E, table 1 of the EIS, and the QRA has used data and methods obtained from recognised authoritative sources. The QRA has 17:50
used models that are widely accepted as industry standard and are considered to be suitable for the purpose. The results of the QRA show that the criteria set by the HSA will be met by the proposed terminal and the QRA report has been subject to independent scrutiny 17:50
by the HSA who accept that it demonstrates that the HSE's criteria for such establishments are met. At least we understand following this morning that that's their view of the current time subject to consideration of the information that has been provided to them by 17:51
Kilcolgan Residents Association.

I conclude that QRA demonstrates that the applicable risk criteria established by the HSA will be met by the proposed terminal. Thank you, Mr. Inspector. 17:51

END OF SUBMISSION BY MR. FRANKS

INSPECTOR: Thank you. It's now 5:50 so I think we will break 17:51
for today. How many more speakers do you have tomorrow?

MR. O'NEILL: I have one more speaker tomorrow, Dr. Raj. His

address is estimated to last about 40/45 minutes.

INSPECTOR: Then we will break for today so we will see everybody again tomorrow morning at 10 o'clock.

MR. McELLIGOTT: Sorry, I just want to say one question. You dealt with the pipeline, but you never dealt with where the pipeline attaches on to the system, the tank or whatever, where you are pumping into the pipeline. You dealt with risk along the pipeline as if it's a pipeline in general, but you never actually dealt with where the pipeline connects on to the storage tanks or vaporisation process. 17:51 17:51

MR. FRANKS: Actually, Sir, we did. Just to explain: There are a number of pipes or as people have been calling them pipelines on the terminal. There is the pipe from the jetty to the storage tanks, this is the one that Mr. Conneely referred to as being pipe in pipe technology this morning. That is covered in the QRA. There are pipes from the tanks to the process equipment that vaporises the LNG back to gas, that is in the QRA. There are then gas pipes on the ground between the vaporisation equipment and the AGI which as I said is the terminus of the pipeline and the equipment there, that's all in the QRA and then there is the length of pipe, gas pipeline, that would take the gas off to the BGE connection that is in the establishment, that is in the QRA. Just to be clear, all of that is in the QRA. 17:52 17:52 17:52

INSPECTOR: Well, just on that point you were answering my question about under grounding of the pipeline and the ESB lines, the electricity lines, did you include an overhead electricity lines in the QRA? 17:53

MR. FRANKS: The way that ignition sources are modelled in the QRA is described in the QRA report, but what it does is take an average density of ignition sources for different typical land uses so it's kind of an average 17:53 ignition source density for urban areas, rural areas or industrial areas and clearly for this facility the average is relevant for the rural type locations so this doesn't sort of pick out lots of individual ignition sources. The average value is stated within 17:53 the HSE methodology as typical for rural land use.

INSPECTOR: So that would be any typical rural land use with the pylons?

MR. FRANKS: It covers all of the 17:54 different sources. What they did to come up with the density was review all of the types of sources that typically occur in rural areas like power cables, like vehicles, just general activities by people and the presence of low density 17:54 population to come up with that value.

INSPECTOR: Okay.

MR. FRANKS: That's a recognised published HSE methodology,

Mr. Inspector.

INSPECTOR: It's an index rather than a reflection of the actual?

MR. FRANKS: It's an average, yes.

INSPECTOR: Thank you. Okay, see everybody again tomorrow morning at 10 o'clock. Thank you. 17:54

MR. O'NEILL: Sir, I can make available, certain of the responses that Dr. Franks gave to the additional questions are contained in the written sheet, some of them are slightly technical. (SAME HANDED) 17:55

INSPECTOR: That would be helpful.

THE HEARING WAS ADJOURNED TO FRIDAY, 25TH JANUARY 2008 AT 10:00 A.M. 17:55

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