Notes on
An Bord Pleanala Oral Hearing

Corrib onshore gas pipeline application
(An Bord Pleanala ref. 16 GA 0004, 16 DA 0004)

Broadhaven Bay Hotel
Belmullet, County Mayo

19th May – 25th June 2009

John Monaghan
Pobal Chill Chomain

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CONTENTS

INTRODUCTION

This document comprises the majority of questioning put to the applicant (Shell E&P Ireland Ltd) by An Bord Pleanala, and includes a summary of the verbal responses given (NOTE: questions from Thursday June 11th not included).

This text is compiled from handwritten notes and should be read only as a guide to the hearing, in conjunction with the application particulars, Environmental Impact Statement, accompanying drawings and the various Briefs of Evidence and supplementary documents.

Wednesday 3rd June 2009

INSPECTOR'S QUESTIONS – DESIGN, SAFETY & STABILITY

NIGEL WRIGHT [pipeline expert for ABP] – To ask questions that the community would perhaps ask if they had extensive knowledge of pipeline systems

NW – [asks about the pressure choke on the subsea installation]

JOHN GURDEN – To regulate pressure for the terminal

NW – Why is the choke not set below 100bar?

JG – Related to flowrate demand. Pressure could be reduced to any chosen pressure.

NW – How many valves are there on the subsea tree?

[missed answer]

NW – How many valves on the manifold?

JG – Don't know

NW – What is the LVI for?

JG - To regulate onshore pressure.

NW – Are there two valve systems?

JG – No

NW – Upstream and downstream regimes different?

JG – Same pipeline, different pressures.

NW – Are two pipeline regimes covered in the risk assessment?

JG – Yes

NW – Is the integrity of the LVI paramount?

JG – Yes

NW – Is this pipeline unique?

JOHN PURVIS – All pipelines are unique. Main difference here is wall thickness. There are comparable pipelines.

NW – [highlights that upstream pipelines are different to norm] Do gas pipelines in Ireland carry CO_2 (carbon dioxide)?

JP – No pipelines in Ireland carrying "wet gas" with CO_2.

NW – Is this pipeline unique in Ireland?

JP – Yes

NW – Any similar pipelines in the UK?

JP – No

NW – [on Dutch pipelines included in Environmental Impact Statement] Any with pressures higher than Corrib?

JP – Yes, one pipe in Moddergat

NW – [points out there are no risk assessments on Dutch pipelines in the EIS]

CIARAN BUTLER – There are pipelines in Holland carrying "wet" gas near houses

NW – What did the Dutch say about QRA?

CB – "We didn't ask"… looked at codes of practice

JP – [also mentions codes]

NW – Do Dutch pipelines get built without QRA?

JG – If pipes are code compliant there is no QRA

NW – Was any QRA done on any of the pipelines visited in Holland?

CB – We'll check, but I don't think so

NW – In the absence of quantified analysis, is the qualitative side assessed?

JP – Not sure

NW – Did Dutch pipelines have CO_2?

JP – Yes

NW – What ground conditions are in Holland?

JP – Sandy type. Low lying

NW – Not bog. What % gas in Corrib?

JP – Typically 97%, as recorded in the EIS

NW – And % CO_2?

JP – 0.3%

NW – So you have acid in the pipeline (CO_2+H_2O)

JP – Yes

NW – Condensate?

JP – 0.05%

NW – Is H_2S (hydrogen sulphide) not accounted for, either now or in the future?

JP – No, it's not

NW – What would happen if H_2S occurred in the gas stream?

JP – We really don't expect it to occur, but we'll monitor throughout the field life. If H_2S occurred beyond a corrosive rate we would review the operation

NW – Is H_2S corrosive in gas pipelines?

MR PATERSON – Corrosive rates are negligible

NW – If they rose to high levels what would be the mitigation?

[missed answer]

NW – Is condensate present as a slug?

JP – Not expected

NW – Joule-Thompson Valve… what is this for?

JP – Pressure reduction valve

NW – Is it to drop out liquid?

JP – [shuffling of papers and conferring] "We made a mistake"

SHELL – [Confirmation that Joule-Thompson Valve is for liquids]

NW – What about the filter at the terminal, is this for particulate matter?

SHELL – Yes, and also as a precaution

NW – Maximum metal loss is expected at the LVI. Is this for particulate matter? There is no filter at the LVI, it's at the terminal.

PAT – Gas is cleaned up at the wells

NW – Why was this not included in the EIS?

PAT – Tests show no problems

NW – Is 345 bar anticipated at the LVI?

JG – That's technically correct

NW – Can valves and chokes fail at subsea?

JG – It's good practice to allow for failure

SHELL – Valves could possibly leak

NW – Is allowing for leaks expecting them to leak?

SHELL – In practice, leaks in shut-in don't pose serious problems

NW – Could 345 get to the LVI?

SHELL – only if a shutdown were longer than we anticipate

NW – Why is the downstream pipe from the LVI designed for 345?

JG – For consistency of design

NW – Hydrotest for onshore pipeline is for 345. Why?

JG – To meet the codes

NW – What valves are at the LVI? There is not much detail in the statements.

JG – Main block valve, 2 double expanding gate valves, shutdown valves etc.

NW – How many times would the main 20" valve be operated during commissioning?

[missed answer]

STEWART BASFORD – They would be tested during operation

NW – What about damage by particulate matter?

JG – Double block and bleed valves deal with pressure but shouldn't be damaged

NW – Can damage occur during exercising (the main valve)?

JG – Damage not expected

NW – Is the valve guaranteed? Could it leak?

JG – All valves could leak

NW – Could 345 from upstream (of LVI) leak into 144 section downstream?

JG – Pressure could be dealt with at the terminal

NW – You're relying on the integrity of the terminal to deal with these problems. This is not in the EIS

SB – We would manage any prolonged shut-in

NW – By flaring?

SB – Yes

NW - Is there venting at the LVI?

JG – No

NW – Is the LVI zoned for explosion?

JG – LVI as described in the EIS

NW – Did you conduct an Explosive Audit [possible explosive substance in a workplace]?

JG – No

NW – Were you aware of the regulation [requiring such an audit]?

JG – Yes

NW – With whom will you discuss these issues?

SB – The Health and Safety Authority (HSA), but they have no input into the LVI

NW – So who do you submit your required Explosion Statement to?

SB – The HSA

NW – Can you confirm the situation with Corrib would be more akin to the Belgian explosion than the Scottish one [Ghislenghien 2004 - Clarkston 1971]?

PHILIP CROSSTHWAITE – I didn't see the presentations

NW – Would you agree with the description of a mushroom cloud as described in the Advantica Report?

PC – Yes

NW – Is a rupture and fire as described in Advantica?

PC – Yes

NW - Do you have any video of tests showing this?

SHELL – No visuals of tests are available

NW – [shows video of test rupture carried out by Advantica]

NW – What height of mushroom cloud would you get at 345 bar (upstream of LVI)?

PC – We don't have that information

NW – Then how were the heat radiation figures modelled?

PC – Using fireball model

NW – For 345 bar?

PC – Yes

NW – What testing was done for 345?

PC – Testing not done for 345, used UK HSE (Health & Safety Executive) models

NW – Has 345 been verified?

PC – No, 345 is extrapolated

NW – So there is some error, due to extrapolation?

PC – Yes.

NW - Did you do full scale tests?

PC – No, it costs too much to carry out large-scale tests

NW – What is the maximum pressure in the models?

PC – Over 100 bar

NW – But not 345?

PC – No

NW – Has shell looked at fireball models separately?

SHELL – No, they are included in the models. Advantica figures are validated up to approximately 150 bar

NW – What are the effects of thermal radiation?

PC – Risk of fatality at certain dosages at specific distances, which tail off to no effect

NW – Can you explain burning building distances (referred to in EIS)

PC – Thermal radiation at high levels for a long time, enough to cause "white wood" to ignite and therefore burn buildings. Escape distance is safe distance covered in 30 seconds moving away from a fire

NW – Where does 30 seconds escape time come from?

PC – According to the models, the difference between being outdoors and getting indoors during an incident

NW - What is the maximum burning building distance for 345 bar?

PC – Up to 230 metres

NW – And for 144 bar?

PC – 171 m

NW – How fast do people have to run?

PC – The models assume 2.5 metres per second, which could be described as "a fast walk"

NW – Does this assume shelter within 30 seconds?

PC – Yes

NW – Can you explain this in relation to proximity to houses? The distances ["escape" and "building burn"] are not shown on the housing maps

PC – They are not shown here [quotes frequency statistics]

NW – So the specifics of this application have not been checked against the methodology?

PC – No

NW – So you have not indicated the areas of assumed shelter for this application?

PC – No

NW – [on the Shell graphic showing risk criterion] Is the vertical axis on the graph (frequency) the critical parameter?

PC – Frequency is one of the critical parameters

NW – Could you define frequency versus consequences?

PC – Both are important

NW – Could you describe the failure frequencies?

PC – Failure for accidental third party interference is the only significant scenario used in the QRA

NW – So all other modes of failure are reduced to zero?

PC – Yes (anything approximately one in a billion or less is discounted)

NW – How are the various failure mode studies compared with each other?

PC – They're not. There are almost no recorded failures on pipelines over 15mm thick

NW - How old is the failure database used?

PC – It goes back to the 1950's

NW – Can you explain the term "extrapolation" in the context of the PIE (Pipeline Integrity Engineers Ltd) report in Appendix Q7 of the EIS?

PC – I'm not an expert in this area

NW – Extrapolation has been used to force assessments on scenarios outside of normal industry experince?

PC – Yes

NW – Gouges in pipes over 25mm thick… extrapolation?

PC – Yes

NW – Is there error in extrapolation?

PC – Yes

NW - Have you extrapolated down in fracture failure frequency?

PC – Yes

NW – Has Shell conducted full size material tests on the Corrib pipeline?

PAT – No

NW – Just laboratory tests on ductile propagation events on pipelines?

PAT – We don't have that expertise

NW – What parameter controls the energy in the pipeline? Pressure?

PAT – Pressure, and the ductile properties of the steel

NW – Does the quoted DNV code fit this application?

PAT – Yes

NW – Have you allowed for the cooling effects on steel during gas escape?

SHELL – Yes. We estimate a maximum temperature drop of 22-24°C

NW – How does the extrapolated 345 bar alter the temperature drop?

SHELL – We don't expect any change with pressure

NW – Have you observed the toughness change on the Corrib pipeline?

PAT – We've tested and shown a drop, but only from 6°C as the pipeline is not above ground. The lowest operating temperature allowed for is –20°C offshore

NW – Offshore pipeline lower limit at –20°C? That means a potential drop to pipeline temperature of –43°C. Where is this in the QRA?

PAT – We'll have to get someone else to answer that

NW – Are boundary events of 10^{-10} set in the QRA?

PC – It's a negligible level

NW – Surely "negligible" should not figure in a QRA?

PC – [quotes 10^{-8}]

NW – Are events reduced to zero purely because they are not in the database?

PC – Some scenarios are very unlikely

NW – Why did IS 328 not override unknowns, and allow the Australian code for qualitative analysis as a replacement?

PC – We were using IS 328 and PD 8010

JG – Where are you going with this? How low a probability are we looking for?

CHAIRMAN – I'm concerned that scenarios outside the control of the applicant have not been quantified

JG – During construction questions we'll be covering the codes that apply to these issues

NW – Does DNV disagree with Mr Hanna (DCENR) that risks cannot be zero?

PC – [mentions codes??]

NW – [databases ?]

PC – QRA only covered ground movement and (third party??)

NW – [goes over numerous failure modes] Who has conducted these other studies?

PC – We looked at other failure modes but only used the events in the database

NW – Who for DNV looked at the other modes? Where are the assumptions justified?

PC – DNV used it's experience and conducted a standard QRA

NW – Are you saying the QRA doesn't include operational events?

DNV – We used the figures in the database

NW – If the European database provides a figure [for certain failure modes] why does your analysis reduce this to zero?

PC – We used values for ruptures. Other failure modes during operation are discounted as they cannot affect the population

NW – How does Dutch failure data inform your QRA?

PC – They contribute to EGIG [European database source] but we didn't explore further

NW – Why, then, did you include the Dutch visit (in the EIS)?

JG – For familiarisation

NW – Why did you ignore intentional damage (as allowed for in the Australian standard) seeing as you state that the LVI and project is so important?

PC – It's standard in the UK to discount terrorist attack

NW – Can anyone in Shell comment on this scenario with an eye on the "wholesomeness" of the pipe?

PC – [quotes various parts of the codes that have allowed PD 8010 to be used rather than the Australian code]

NW – What would you expect for physical security precautions at the LVI?

JP – Single security fence and CCTV

NW – Has event time/response time been calculated at the LVI?

SB – People will be observed before they get to the LVI, and security deployed

NW – Have you demonstrated an attack in the QRA?

PC – Terrorism and vandalism are excluded from the QRA

JP – [quotes PIMS (Pipeline Integrity Management Systems)]

NW – What about pipeline coating failure [from 2005 as described in Advantica]? Were your integrity management systems not in place at that time?

PAT – Under normal circumstances it would have been replaced

NW – So it slipped through the system?

PAT – Normal procedures would have been applied

NW – What about the CP (cathodic protection) isolation joint at Glengad (as recommended by Advantica)?

PAT – Our study deemed this unnecessary

NW – What is the figure for pinhole failure?

[missed answer]

NW – What happens with pinhole failures?

PC – There would be a stable fire, but it would not impact on any housing

NW – Why were pinhole failures not included in the graphical representations of 345/144 at the LVI?

PC – They were included in the general risk analysis but not specifically expressed

NW – [metal loss in Advantica] Can you comment on 1mm loss versus 3mm loss (in a fluctuating flow)?

PAT – We used a Shell proprietary model in the EIS

NW – Is fluctuating flow included?

PAT – Yes

NW – Have you allowed for condensed water as well as produced water in the flow?

PAT – Yes

NW – Does the type of water affect corrosion?

PAT – Yes, but the extra corrosion would mostly occur offshore

NW – Will these levels be monitored?

PAT – Yes

NW – So monitoring will be used to mitigate risk?

PAT – Yes

NW – What does hydrate inhibitor do? What are hydrates?

JP – Ice crystals in the pipeline. These will be reduced by using methanol

NW – Can you describe how to minimise pressure differences either side of a slug (ice obstruction in pipeline)?

JP – We haven't written those procedures yet?

NW – Can water accumulate anywhere in the pipe?

PAT – Pipeline is mostly uphill to landfall. Specific details to be dealt with by procedures [as yet unwritten]

NW – So how do you reduce those risks to zero?

[missed answer]

CONOR O'DONNELL [geotechnical expert for ABP] – Which failure rate for ground movement is more applicable in Ireland, EGIG or PD 8010?

PC – Applicability is variable. Issues in UK are mostly due to mining activities, elsewhere it would be landslide

COD – Does the quoted failure rate exclude all other forms of ground movement outside landslide?

PC – We don't have that information here

COD – [questions figures compared to PD 8010-3] Can you explain why all values for potential ground movement were not in the DNV report?

PC – We excluded ground slip during operation, but included it for construction

COD – Have other geotechnical modes been included, such as differential settlement?

JP – Differential settlement not considered credible

JG – Stone road construction eliminates stability issues for the pipeline

COD – Has testing on pipe thickness eliminated this?

JG – We don't have the figures here

TURLOUGH JOHNSTON – [mentions Advantica]

COD – Ground movement is stated as negligible. Where did this come from, a database or specific analysis?

PC – Based on Advantica analysis of J P Kenny study and change to stone road design

TJ – Site specific analysis has also been used

COD – Can landslide affect the LVI from Dooncarton, and result in pipeline failure?

JP – No

JG – Pipeline is too far down. Failure of above-ground structures would not impact on pipeline integrity

COD – Are the quoted categories of ground movement easily transposed over the QRA?

PC – Not directly. Interpreted as zero/negligible

COD – Have you carried out a sensitivity analysis?

PC – Carried out but not included in the EIS

COD – Does it impact on the calculated risk?

PC – Increased risk but negligible

COD – [to Johnston] How much advice did you give DNV regarding stone road stability?

TJ – We don't advise the QRA people. We've complied with the relevant codes

COD – How does granular fill impact on stability on the stone road?

TJ – We've complied with the codes

COD – What about slip on weak peat?

TJ – [references codes again]

COD – What about stone pushed into the peat?

TJ – Stone to be carefully placed as per Bellanaboy tests

COD – What about weak peat as a worst case scenario?

TJ – Not possible

COD – Would you consider using sheet piles?

TJ – Could be used to assist, but could cause different problems

COD – Have you monitored the stone road at Bellanaboy?

TJ – To a certain degree, but there are no records to show settlement

COD – Would disturbance of the road be visible?

TJ – Not visible to date, but may be visible if it's occurring

COD – Would traffic disrupt visual observation?

TJ – Yes, as would grading off the surface

COD – What grade of fill is to be used?

TJ – Similar to existing roads already achieved

COD – Would the highest loads on the stone road occur during construction?

TJ – Yes

COD – What impact would up-slope movement have on the pipeline?

TJ – Stone road would improve stability

COD – Has the possible lack of down-slope support been allowed for?

TJ – This is not an issue

COD – Have you a contiguous assessment of ground conditions on Rossport commonage?

TJ – No, but we know the conditions in that area fairly well (from other borehole studies)

COD – Do you accept that ground failure in Ireland can occur from weak underlying soils?

TJ – Yes, but we feel in this case very unlikely. Any issues will be engineered around as they arise

COD – Would it be advisable to include stability issues in the QRA risk analysis, given the current uncertainties

TJ – No, we don't anticipate any issues

COD - [questions to RPS to follow on tomorrow]

COD - Will there be pipe stress monitoring?

JP – We'll be monitoring the peat as well as the pipeline, using GPS type monitoring

COD – Why is this not included in the PIMS (Pipeline Integrity Management System)?

JP – It will be as a prudent measure

COD – Zero risk assumed suggests a robust system of monitoring. Are you satisfied you have this?

TJ – Visual inspection and GPS monitoring is standard and should be sufficient

NW – Has extra stress monitoring been considered?

TJ – The stone road should be sufficient

NW – Should it not be considered, because of the lack of data on stone roads in peat?

TJ – We'll have to discuss this ourselves further

NW – Can we have the outstanding issues and data by tomorrow morning? [ie. pinholes on risk transects and topography for escape distances]

NW – Would you agree there is a role for the CER (Commission for Energy Regulation) during construction?

SHELL – DNV are monitoring the project

NW – And who do they report to?

AGNES McLAVERTY – Shell have appointed an independent third party to monitor the construction work

NW – And who is that party? Will they have full access to reporting and make the information publicly available?

AMc – It's DNV. It is not envisaged that the information will be made public

NW – Is the longest mini-tunnel to date approximately 300 metres, when your plan is over 1000 metres?

EAMON KELLY – There are tunnels longer than 1000 metres already

NW – Will the pipeline coating be damaged during tunnelling, and how would you know if it did happen?

EK – We don't see how that can arise

PAT – Prevention is the primary response, and the coating is very robust. The pipe void is also to be filled with a grout to remove air and water

NW – Will the grout be prone to shrinkage and subsequent water ingress?

PAT – We are still working on the details

NW – How do you bend thick-walled pipe?

EK – The radius is very large

NW - How will this radius be ensured?

EK – There will be continuous monitoring during construction

NW – Would you agree that too many scenarios are not detailed in the QRA?

PC – Many are not specifically mentioned

NW – Should qualitative as well as quantitative work be done?

SB – Qualitative risk assessment has been conducted since the application was made

NW – Will this be made available to the hearing?

ESMONDE KEANE – We'll enquire into what has been done

NW – Again, would you agree this pipeline is unique and that the standards in Ireland should be unified?

JG – We are using only two codes

NW – Are you using EN 14161, IS 328 and PD 8010… that's three!?

JG – Yes

NW – Did you do a QRA on the umbilical?

PC – DNV did not QRA the umbilical

NW – Did anyone in Shell?

JP – No

NW – What about qualitative?

JP – No

NW – What about issues such as methanol?

SB – We've worked on some consequences but not worked them into the QRA

NW – Is it in the EIS?

SB – No

NW – That means it's missing! What about impact on the environment?

JP – No, it's not in the EIS as far as we know

COD – [reminds Shell about information sought on stability and planar sliding, gives notice again that questions are to be put to RPS] There is no information on the probes used in Rossport commonage. Can you comment?

EK – We are not in a position to comment on that right now, perhaps tomorrow

COD – [references adequacy of information on construction methods, peat stability and monitoring during construction] Can you comment on the limited information available?

TJ – We are confident of our robust design

COD – What about qualitative parameters for drained and un-drained peat and exposures?

TJ – [quotes all the observations made]

COD – Have you seen the probe and shear strength data?

TJ – Yes, we've had access to that

COD – What type of probes are they? Have they just shown peat depths?

TJ – Just peat depths

COD – Have you taken any samples?

TJ – I don't think so

COD – You've given the impression of a robust design, but it's not based on any real data outside basic probes, is that fair to say?

TJ – We've also used our experience

[discussion follows on specific equipment used]

COD – Would you accept there is a degree of uncertainty in the ground conditions? It is not sufficient to rely on observations during construction

TJ – We are confident of our robust design

COD – Are the unknown areas relatively small?

TJ – [repeats at length previous comments]

COD – What investigations were conducted south of the L1202 (road) on areas of peat?

TJ – [lists various methods of investigation]

COD – [outlines problems experienced with the previous studies] You appear not to have established full peat depths in Rossport commonage

TJ – [repeats at length previous comments]

COD – [repeats the question of peat depth, highlights the absence of any analysis of underlying material]

TJ – [admits underlying ground is unknown]

COD – Limited exposures do not confirm trial pit results (granular material v running sand)

TJ – [maintains differences are well understood, describes general topography]

COD – The assumptions are not verified?

TJ – No

COD – What additional work would be required to fill in the gaps and ensure ground and stone road stability?

[question unanswered; Chairman ends proceedings for the day]

Thursday 4th June 2009

INSPECTOR'S QUESTIONS – DESIGN, SAFETY & STABILITY (continued)

NIGEL WRIGHT – [asks about QRA in Holland]

JOHN PURVIS – Information to be produced later today

NW – [in relation to pressure control for onshore pipeline] Will flaring (at Bellanboy) be used as a last resort?

STEWART BASFORD – Flare path may or may not be available at Bellanaboy

NW – If flare is not available, what do you do?

SB – We could put in a temp[orary] line to the flare

NW – How long will that take?

SB – A couple of days

JP – This scenario is very unlikely, we're talking about multiple failures

NW – A single event can trigger a number of failures, especially up to 345 bar

JP – This is extremely unlikely

NW – But still possible

SB – The remote scenario would be managed by monitoring systems. "There would be no excursions above 144"

NW – What equipment is in the cages above ground at the LVI?

SB – Actuators etc…

NW – Would the HIPPS system close if the actuators are damaged?

SB – Yes, they would automatically close

NW – What would happen at the subsea installations

SB – Wells would be shut in, chokes and valves would intervene

NW – What about a lock-in at the LVI and damage to the actuators?

SB – Equipment would be replaced, but this could take a number of months. Shell worldwide would have spares available

NW – How would you repair a subsea failure?

SB – Our systems would apply

NW – Vessels would have to be found, crews called in etc.?

SB – Yes

JP – We do this in the North Sea regularly

NW – Are contracts signed to prioritise something like subsea failure on Corrib?

SB – [shell procedures would apply]

NW – [asks DNV to explain new graphs provided on pinhole risk transects]

PHILIP CROSSTHWAITE – [explains table]

NW – Have you included getting to shelter?

PC – No. We only do that for ruptures, not leaks

NW – What about my second question from yesterday, escape distances at ruptures?

PC – The figures already given are typical of QRA

NW – What about shelter?

PC – The situation in Rossport could be broadly described in three areas

1 parallel to road – escape distances achievable
2 road crossings – escape distances achievable
3 commonage – difficult terrain… people could perhaps seek shelter behind a ditch

NW – Could SEPIL interpret these scenarios on some sort of diagram?

SHELL – Yes

NW – Will Shell submit a report on other failure modes?

ESMONDE KEANE – We're looking into it

NW – When will that information be available?

KEANE – It could take several months

NW – So not for this oral hearing?

KEANE – No

NW – [reminds Shell that additional information on pipe coatings is required]

MR PATERSON – [on estuary crossings] The grout will shrink onto the pipeline, and cathodic protection will still operate. Coating adhesion [questioned by Advantica] will be to the French code of practice and Shell's own standards

EAMON KELLY – [outlines trenchless tunnelling projects]

NW – Was this detail in your original submission?

EK – No

NW – Are they the same techniques as proposed for Corrib?

EK – Yes

CONOR O'DONNELL – [closing out questions on ground movement]

JOHN GURDEN – Studies shown were for pipeline in peat, the stone road construction would be more stable and therefore not studied

COD – What are the boundaries of the "zero risk" assumption in the QRA?

PC – Zero risk for ground movement is appropriate

COD – What about differential settlement in uncompacted fill?

TURLOUGH JOHNSTON – A coarser fraction of stone would be pushed into the bottom layer of peat. A control of half a metre would be maintained

COD – A controlled half-metre is not a correct assumption in deep peat, and is it fair to say it would not be compacted?

TJ – Not fully compacted, but adequately stable

COD – Have you planned for settlement for the permanent stone road?

TJ – We don't anticipate this

COD – [mentions failure frequency in the QRA for ground movement]

PC – [explains the new graph provided by Shell]

COD – Have you considered rupture only?

PC – Pinhole, hole and rupture are included

COD – [points to significant differences between orders of magnitude ie. base frequency included in PD 8010-3 versus new graph]

PC – [explains table from PD 8010-3]

COD – Is the figure presented classed as negligible? ($9x10^{-8}$)

PC – No

COD – Would the outcome be significant in a QRA?

PC – It would affect the QRA, but the value would be infinitesimal

COD – Would the difference affect escape distances?

PC – No. It would affect frequency but not consequence

COD – What about 345?

PC – Pipeline upstream of LVI was looked at, but risks are confined to the LVI itself. If sensitivities are credible we include them, if not then we omit them for clarity

COD – What about landslides in relation to the LVI? Has anyone from Shell or RPS studied this in any detail?

SHELL – No, we referred to the Tobin report

COD – Did debris from the 2003 landslide reach the beach below the LVI?

RPS – Yes

TJ – The Tobin report covers the significant events of the landslide, and is available from Galway County Council

[observers correct that: "it's Mayo!"]

TJ – Sorry, Mayo County Council

COD – Is there a landslide risk between those areas that experienced damage in 2003?

RPS – The landslides generally followed the watercourses

KEANE – There is no evidence that material reached anywhere near the LVI or the beach

TJ – We don't feel it necessary to model for landslide effects near the project

COD – Have you considered a weak layer of peat at the base of the stone road?

TJ – No

COD – Is there a requirement to allow for live load (during construction) in the codes?

TJ – Not in any codes currently applicable

COD – Would it be prudent to include the provisions in codes that do exist?

TJ – We are confident in the codes we are applying

COD – If de-watering would be required, the safety factor would be very low. Would it not be prudent to model for this?

TJ – We would deal with any localised issues as they arose

COD – Why were specific issues - included in the reports supplied today - not included in the current application?

RPS – We included them in the previous EIS [2008] but only referred to them in this one

COD – Is there information on the specific probes used included in the new information?

RPS – [gives names of probes used]

COD – Was the full depth of peat recorded?

RPS – Yes

COD – Were probes pushed to refusal?

RPS – Yes

COD – Were samples taken?

RPS – No

COD – So there is no confirmation of the underlying ground conditions?

TJ – [restates yesterday's information about observing exposures etc.]

COD – How was peat stability used in the route selection stage?

CIARAN BUTLER – Peat stability was roughly considered along with construction methodologies. Geotechnical specialists considered all eight routes. The route selected satisfied our requirements

COD – Were all corridors assessed for peat stability?

CB – All bar the Bay route (Sruwaddacon)

COD – What factors were considered for peat stability?

CB – I'd have to confer

COD – Were any of the other routes less of a risk for peat stability?

CB – I'd have to confer

COD – Were any other routes ruled out specifically on peat stability?

CB – Corridor B traversed steeper peat, but other factors were used also. Peat stability was one element only. We also looked at landslides

COD – What criteria were used for considering peat stability?

CB – [repeats at length previous comments]

COD – Have you predominantly used the watershed areas (for the proposed pipeline route) that would have the deepest and weakest peat?

TJ - [repeats at length previous comments, supplemented with maps]

COD – [to TJ] Were you involved in the route selection process?

TJ – No

COD – I'm looking for information in the route selection process with respect to peat stability

CB – Peat stability was only one aspect

COD – Were the routes ranked specifically for peat stability?

CB – Yes, we looked at risk of landslides

COD – I'll be specific again, because I'm not getting any answers. Is there a specific route within the current corridor that would be preferable for peat stability?

CB – It's not the only factor for route selection

COD – I'll move on. Why has open trench construction [originally planned] now been changed to micro-tunnelling?

EK – Predominantly for environmental reasons

COD – Would the corridor up the bay be technically feasible?

EK – Further investigation would be required but it could be feasible

COD – What difficulties would be associated with open cut pipelaying (in the bay, on geotechnical grounds)?

EK – I'll have to confer

CHAIRMAN – During the pre-application consultation there was an indication from the board that alternative routes should be robustly assessed

EK – The main problems are with rock and loose material

COD – Can you classify the ground conditions where open-cut trenching could take place (river crossings)?

RPS – Silty sands, gravels rocks etc. Open cut trench would be interfered with by the tides, issues with sheet piling etc.

COD – Could a trench be cut through the bay?

RPS – Yes, it could be physically achieved

COD – What about access?

EK – There would be a causeway and possibly jack-up rigs

COD – What about across deeper water?

EK – That would need to be assessed

COD – Would you have difficulties, for example, with granular material?

EK – We need to confer… excavation would be most likely, with dredging and a maintained channel flow

COD – Would rock-breaking be required at 'Section 1' of the proposed route (Glengad)?

RPS – It would be very limited

COD – What about nearshore (current works)?

RPS – Not much

COD – Was vibration monitoring carried out?

RPS – We are not aware of any

COD – Would you consider there to be a risk to the stability of Dooncarton?

RPS – The short answer is no

COD – Because of reports from residents of vibration, would you consider vibration monitoring prudent?

RPS – We'd have to consider that

COD – Which direction would the tunnelling (Section 2) propose to be started from?

EK – That's not decided yet

COD – [asks about machines to be used for tunnelling]

EK – [outlines equipment specs]

COD – Are you to monitor the possible damage to the tunnel crown?

EK – Yes, but depth of cover would minimise that possibility. It's very unlikely

COD – Are you aware of problems in similar ground in other projects in Ireland [mentions Dublin Bay]

EK – No

COD – Would you agree there is a possibility?

EK – Yes

COD – What about an intervention pit?

EK – That would be very unlikely

COD – What about scouring of the Bay during operation of the pipeline?

EK – We don't anticipate this

KEANE – Our expert on this isn't here, we'll hope to have him present before end of business tomorrow [COD will not be available after this]

COD – Is there a risk of coastal erosion at Rossport landfall (Section 3)?

RPS – We don't anticipate this

COD – Is the upper crossing anticipated to proceed from the south side of the Bay?

EK – Yes, from the Aughoose side

COD – Of course, the scouring issues would also apply here. Can you confirm that stone road construction is to be used for all peat areas?

TJ – Yes, I can

COD – [confirmed areas – by chainage points – to be subject to the stone road method of construction]

COD – [questioned storage of peat turves in different areas]

TJ – Turves to be stored in a single 500mm layer on bog mats

COD – Potentially next to an open trench?

TJ – At a safe distance

COD – And storage of peat destined for Srahmore?

TJ – No peat will be left on peat

COD – And deep peat will be mixed with stone to depths greater than 2.5m?

TJ – Yes, potentially

[missed question]

TJ – Not to be stored on peat

COD – Is excess stone to be taken off site?

TJ – Yes

COD – In all types of bog?

TJ – Yes

COD – There is an apparent discrepancy between the QMEC study and the information in the EIS regarding cutover/intact bog

TJ – There is a mixture, but it's all cutover to some degree

COD – Is the QMEC map correct, and your map incorrect?

TJ – Yes, but there's very little difference

COD – Is the same storage method to be used in similar areas in the SAC?

TJ – Yes

COD – Will all surplus material be moved to Srahmore?

TJ – Yes

COD – Where will turves be stored when close to watersheds?

TJ – In principle, they will be stored upslope of the stone road

COD – But some discretion will be used in flatter areas?

TJ – Yes

COD – What methods of construction will be used for compounds?

TJ – I'll refer you to Mr Kelly

EK – Planned to excavate all areas of peat in the footprint and store for reinstatement

COD – Will stored material become a barrier to drainage?

EK – That is possible, and would need to be discussed

COD – What modes of failure have been analysed for both during and after construction?

[missed answer]

COD – What about bogbursts?

TJ – "Bogburst" is an emotive term

COD – It is a standard form of failure. Failures are known to occur, such as in Dooncarton

TJ – "It's not fair to compare the Dooncarton landslides to our own area"

COD – Are sheetpiles to be used?

TJ – We don't expect sheetpiles will be required in the SAC areas, their use is to be kept only in reserve

COD – Would sheetpiles help with stability in weak peat?

TJ – It would, but this is not anticipated. The problem with sheetpiles is possible displacement of ground when they are removed

COD – [discussion on design codes] The standard declared is less conservative than the European code

TJ – Perhaps, but it is well established

COD – [discussion with TJ on errors in chainages depicted in the EIS]

COD – Stability analysis for Rossport commonage is included, what about the other areas?

TJ – Rossport commonage is only included as an example, other data for areas more stable is not included

COD – [discussion with TJ on different planar failure modes]

COD – Would you accept that there is a degree of uncertainty as previously described?

TJ – We accepted that you have that view, but there is sufficient data collected otherwise

COD – Are there areas with a higher possibility of planar failure along the route?

TJ – No. We've found no evidence of that, such as low strength clay

COD – [takes the discussion to the L1202 road crossing – RDX4 – an area of relatively deep peat adjacent to a forestry drain] Would you accept the road crossing is an area of "exacerbated risk"?

TJ – I wouldn't say that. There isn't an issue, as we know the ground conditions

COD – Would you accept there are other areas of elevated risk along the pipeline route?

TJ – [consults with colleagues] … this issue is unique on the route

COD – Have you considered how flush systems have been included in your analysis on peat stability?

TJ – [difficulty locating the areas on the maps, followed by a computer crash] Our proposal is to maintain the feed to the flushes, including feeder pipes if required

COD – Will movement be monitored?

TJ – Yes

COD – Have you allowed for reduced stability during heavy rainfall?

TJ – No, we don't anticipate that

COD – Would you agree that heavy rainfall contributes to landslides and bogslides?

TJ – It does contribute to instability, but is not expected here

COD – How would you mitigate against possible bogslide on the proposed route, and their possible occurrence near bog pools?

TJ – We don't consider such a possibility credible

COD – [discussion with TJ on permeability]

COD – Have you any test results that demonstrate a lower permeability as described in your construction methods?

TJ – From experience we have observed no difficulties in that regard

COD – Have you anything other than field observations for permeability conditions?

TJ – No, we don't

COD – Will you be monitoring these factors during construction?

TJ – Yes

COD – Will you employ some of the American models in this regard?

TJ – We have no plans to do that

COD – Do you plan to use anything other than GPS monitoring?

TJ – [outlines a number of methods, all supporting GPS]

COD – Are GPS markers prone to damage or vandalism?

TJ – Yes

JP – We will monitor this with walkover surveys and will replace them if required

COD – Can you confirm the two methods of stone road construction proposed?

TJ – Yes. Type 2 in peat depths over 2.5 metres

COD – Has there been any indication of peat movement around previous works adjacent to roads?

TJ – No, we observed no movement

COD – Do you have any records of this?

TJ – No

COD – So just visual observation?

TJ – Yes

COD – What was the intention of previously using sheetpiles in the bog?

TJ – To maintain stability on slopes

COD – Were there any difficulties with running sand?

TJ – We loaded stone very quickly, so it wasn't a problem

COD – Were mineral soils exposed during construction of the stone road?

TJ – Not to my knowledge

Monday 8th June 2009

INSPECTOR'S QUESTIONS – ADDITIONAL

NIGEL WRIGHT – [during questioning by Micheal O'Seighin] Is there a QRA from the Australian project [Casino, referred to earlier] compared to this project in the EIS?

JOHN GURDEN – It's not available online, as we had previously assumed.
…..

JG - [in response to further questioning] Offshore pipelines don't strictly use a design factor. Technically, the section sea-side of the LVI is at 0.72 [the original onshore design factor prior to the Advantica recommendation of 0.3]
…..

NW – [pursues point on pigging plans]

JG – Details can be supplied

NW – [interested in accuracy on thick-walled pipe] On-line inspection is "normally the primary tool" to ensure integrity

JOHN PURVIS – [defends the planned inspection programme]

NW – [pushes on importance of inspection effectiveness… compares it with unforeseen events previously experienced ie. loss of excavators in deep peat]
…..

STEWART BASFORD – The offshore pipeline will not be de-gassed using the flare at Bellanaboy

…..

NW – [to JG on in-line inspections on thick-walled pipe] "Are you saying this is a research and development project?"
…..

PHILIP CROSSTHWAITE – [referring to alternative codes] "Chopping and changing between codes is not particularly good practice"

NW – If an Australian pipeline is referenced, why is the Australian code not also relevant?

CHAIRMAN – Corrosion, welding, defects etc. are all valued in the QRA as zero, zero, zero… that's not adding up to a quality assurance.

ESMONDE KEANE – [responds by quoting what has been done to satisfy different parts of the chosen codes in relation to proximity of housing]

CHAIR – [refers to specific design code documents, possibly PD 8010-3] Where on figure 2 is 144 bar?

KEANE - [repeats at length previous comments on proximity]

NW – [asks about failure data on subsea flowlines with methanol/raw gas/corrosion inhibitor (as per this application)]

JP – We don't have that information, but I know we've had two failures in the past few years, associated with deadlegs on oil pipelines

NW – [to JP] Do you have data on failure frequencies on wet-gas pipelines?

KEANE – [after conferring] I understand this could be a massive amount of data, involving third parties who may have problems with producing it, including logistical problems

NW – [reads out various failure frequency data from TD2 eg. slope instability, slugs etc.]

PC – We use a publicly available database, and would need to be convinced about applying other data

NW – But this is a Shell pipeline with proposed Shell management schemes, would it not be logical to use a Shell database?

PC - [speaks at length about Advantica]

NW – In light of the information you have now, would you review your figures?

PC – I will discuss this with my colleagues, but would need some convincing

Wednesday 10th June 2009

INSPECTOR'S QUESTIONS – CONSTRUCTION AND TRAFFIC

CHAIRMAN – There seems to be a lack of data on Rossport (traffic studies)

CONALL Mac AONGUSA – [outlined studies carried out in January 2009]

CHAIR – How many walk to school?

CMac – Numbers are very low (but unsure of figure)

CHAIR – What about movement of animals?

CMac – Not observed

CHAIR – Will the traffic movements not be significant, and in both directions?

CMac – It will be significant

CHAIR – How have you allowed for pedestrians and animals?

CMac – Our usual conditions will apply

CHAIR – Are any road closures planned?

EAMON KELLY – No. Convoys controlled by radio… same system as is currently applied

ESMOND KEANE – [comments on possible "mis-use of roads" by people intent on causing disruption]

CHAIR – But you don't plan any road closure orders? This is part of your duty of care

EK – Previous conditions will apply

CHAIR – What assessment of the roads has been carried out by the applicant for expected construction traffic?

CMac – [mentions Mayo County Council surveys]

CHAIR – What about the applicant?

SHELL – We've done a walkover survey (quotes Traffic Management Plan)

CHAIR – That describes traffic, I'm talking about the condition of the roads

SHELL – [refers to a diagram]

CHAIR – It says road widths to be maintained

SHELL - [repeats at length previous comments, refers to roadworks to be conducted by Mayo County Council]

CHAIR – I'll put it another way, because I'm not getting the information. What information have you supplied to Mayo County Council?

CONOR BYRNE (Shell) – Historically carried out surveys on pavement conditions (but not in Rossport). "Going forward, our philosophy on the onshore pipeline will be similar" [to that applied to the Corrib project thus far]

[continues about L1202 and haul route to Srahmore. Maintains the integrity of the strengthening works has been proved, robust design etc.]

CHAIR – Is the information on pavement design available?

BYRNE – [repeats at length previous comments about design integrity]

CHAIR –Information in the EIS is "very slim to say the least". If extensive survey work has been done it should be available

KEANE – We'll get that

CHAIR – What services are in Rossport?

BYRNE – Group water scheme, Eircom, culverts etc.

CHAIR – Do you know where they are they located?

BYRNE – Mayo County Council have some maps

CHAIR – Will your truck drivers read these maps?

BYRNE - [repeats at length previous comments]

CHAIR – This is all low-level information

BYRNE – [talks down the potential difficulties, including landowner issues] "We consult with our neighbours"

CHAIR – Why is essential information not included in the EIS? There was more in the 2008 application.

BYRNE - [repeats at length previous comments on construction techniques]

CHAIR – What about extreme weather that may not fit into your plans?

BYRNE – We'll apply the methods used for Glengad. "We've mobilised to Glengad three times" and "de-mobilised" successfully

CHAIR – [queries some of the survey figures] What details do you have on expected construction traffic eg. weight of lorries and loads?

BYRNE – Quotes weights for "standard construction traffic"

CHAIR – How do you deal with abnormal loads?

BYRNE – We normally carry out a study, and usually bring in specialists [mentions Traffic Management Plan and driver inductions]

CHAIR – Will all your exceptional movements be dealt with at one time?

BYRNE – Extra loads are normally notified two weeks in advance, public interaction with "construction liaison personnel"

CHAIR – What about removing materials such as temporary stone roads?

BYRNE – Such material would be transported to a licensed facility (subject to securing a waste permit)

CHAIR – Where is that… Ballina?

BYRNE – Exact facility not identified at this time

CHAIR – What about the stone?

BYRNE – We'll try to recycle that if possible, otherwise remove to a licensed facility

[missed question]

BYRNE – [speaks at length about interacting with the community during current works] "Construction liaison team regularly calls to local residents"

CHAIR – You're giving more refined detail now that's not in the EIS

BYRNE – The Traffic Management Plan is a "live document"

CHAIR – What about construction workers parking at compounds?

EK – Parking will be within the compounds, will not be allowed on the roads

CHAIR – Do you use group transport [car-pooling]?

BYRNE - [inaudible answer]

CHAIR – Are you grouping or not?

KEANE – I'll take instruction on that

CHAIR – What are your plans for accommodating pedestrians and cyclists?

BYRNE – Our drivers have training…

CHAIR – [interrupts] Does a cyclist have to wait five minutes for a convoy to pass? How do you cope with things like this?

BYRNE – [suggests the use of flagmen]

CHAIR – A stop-go system with flagmen?

BYRNE – Yes

CHAIR – [asks about noise levels during tunnelling]

DARRAGH KINGSTON – [gives dB levels for generators]

CHAIR – Will they be working day and night?

DK – Not in all areas

CHAIR – How many generators to be used apart from the tunnelling?

DK – Two

KEANE – More may be required for security lighting

CHAIR – How many generators will be operating at night?

EK – A small number anticipated at each of the compounds, but not anticipated at night

KEANE – Security lighting to be used "as required" but cannot be specified at present

CHAIR – What is the likely level? You have a lot of experience by now on this.

KEANE – We'll get back to you with a written reply on this

CHAIR – What about night-time noise from diesel generators?

DK – Generator noise levels will not be more than that from tunnelling

CHAIR – Have you verified the models for noise on the site?

DK – Not for tunnelling, we've modelled for traffic noise

CHAIR – If your noise levels cause difficulties, what do you do about that?

DK - [repeats at length previous comments]

BYRNE – We conduct noise modelling at Glengad and can make that data available

CHAIR – How have you confirmed the predicted noise levels and what kind of disturbance should people expect?

DK – [quotes noise ISO standards and generally describes expected conditions]

CHAIR – Noise at the LVI, 80 dB continuously for 36 hours? How do you mitigate against this?

DK – That will not extend into the environment, extremely unlikely to happen. Even if it did it is an extremely short duration

CHAIR – If this will not extend beyond the LVI then where is this in the EIS? The oral evidence does not agree with the Environmental Impact Statement.

KEANE – [will give a written answer]

CHAIR – [reminds Shell to include security-related noise]

[lunch break]

CHAIR – Was the pipeline welded in 2005 part of the construction phase, or just tests?

MR PATERSON – Part of construction, approximately 1½ kilometres

CHAIR – Have you checked the bonding of sleeves since then?

PAT – Yes, we reviewed procedures and carried out pipeline care

CHAIR – Have you checked for quality assurance?

PAT – Yes

CHAIR – Do you (SEPIL) have a policy for pipe storage?

PAT – No policy

CHAIR – Who makes the decision on pipeline storage?

PAT – [outlines the history of handling of Corrib pipe sections] Corrosion experienced on pipes is superficial

CHAIR – Is the management and storage of pipes part of the PIMS?

PAT – No

CHAIR – Have you seen the images shown by observers?

PAT – No. I've seen the Kuprewicz report [part of the CPI report]

CHAIR – Have all the pipes - bar the four tested – been internally coated?

PAT – Yes

CHAIR – Why did it take so long to replace the damaged end-caps?

[missed answer]

CHAIR – [asks Keane about profile of security situation]

KEANE – [details to be provided]

CHAIR – [notifies Shell that more information is needed on vibration monitoring] It is a significant issue. Saying it will be done doesn't assist me much.

[asks about pre-construction survey work]

EK - [talks at length about consultation] "Pre-construction activities have been going on for some time"

CHAIR – What about consultation difficulties with landowners?

EK – We deal with the small number of landowners directly affected by the pipeline route

CHAIR – You may feel it's OK, but I want to know how you intend to achieve your goals if difficulties arise.

EK – Our agricultural liaison officer will deal with things as they arise, we have one or two teams on the ground (consulting)

CHAIR – I'm not getting any more than I've read. What is the reinstatement sequence at Glengad?

EK – Pipe ditched, backfilled, subsoil aerated, drains reinstated, stones picked, topsoil overlaid as before, grass seeded or vegetate naturally. Same procedure on grassland on "the other side" [Rossport]. Different on peat areas. Drainage pipes may be placed, some stone removed and peat turves replaced. Reinstate the SAC as quickly as possible

CHAIR – Will the hydrostatic testing be done all at once?

EK – Pre-testing of crossings done first, then pipeline testing repeated overall

CHAIR – So reinstatement will be done after commissioning?

EK – Yes, but the SAC will get priority

CHAIR – Will the fencing be in place during testing? What do you intend to do?

EK – Fencing to be removed at reinstatement, after hydrostatic testing. Stock-proof fencing then put in place (required for quality reinstatement)

CHAIR – [to KEANE] Has the Environmental Management Plan been prepared for the pipeline? What is it's status? If it's more than an outline draft plan, will it be submitted?

[missed answer]

CHAIR – Where does the hydrostatic testing water go to?

EK – It comes from the terminal, to be discharged to the sea after use (in consultation with the relevant bodies)

CHAIR – Where does the offshore pipe meet the onshore pipe?

KEANE - [speaks at length about an "interface"]

CHAIR – I'll put it this way; where does the 20" pipeline - subject to this application - start?

KEANE – [speaks at length about "overlap" and references chainage points on the map previously provided]

CHAIR – So it's somewhere between 83.400 and 83.442?

KEANE – Yes

CHAIR – The umbilical is to be laid in 2010?

KEANE – Yes, subject to a further Section 40 consent [Gas Act 1976]

CHAIR – Where is the offshore umbilical going to terminate?

EK – In the LVI, at the chamber for this

CHAIR – Can you give me a chainage?

EK – [refers to documents] 83.478

KEANE – A casing pipe in the cliff will be laid as part of these (current) works

CHAIR – Is that casing part of this application?

KEANE – [paper shuffling] No, not part of this application

CHAIR – Where does the onshore umbilical start?

JOHN GURDEN – In the chamber on the LVI drawing

CHAIR – When is the outlflow pipe to be laid?

KEANE – This year

CHAIR – Where is the outflow interface?

KEANE – Between 83.400 and 83.442

CHAIR – How long will the temporary fencing remain after pull-in?

BYRNE – Fencing to be removed after completion of hydrotesting the offshore pipeline and the compound has been substantially demobilised

CHAIR – Will reinstatement be completed before any onshore pipeline approval?

BYRNE – Reinstatement up to topsoil replacement, remainder subject to timing

CHAIR – Is there any other work – on-land - to be conducted at any stage under the 2002 consent?

KEANE – I'll take instruction on that

Tuesday 16th June 2009

INSPECTOR'S QUESTIONS – ROUTE SELECTION

[missed question]

CIARAN BUTLER – "Until we had a route we didn't go into any detail"

CHAIRMAN – The Board expected a detailed examination of alternatives. "Robust route selection analysis" and detailed consideration of design pressure (144bar)

CB – [refers to Chapter 3 of the EIS] Applicant looked to increase distance to housing

DES COX – [refers to previous (withdrawn) application] "Qualitative" assessment

CHAIR – [points to selection criterion summarised in the EIS] "Would you consider that robust?"

CB – Yes [speaks at length of criterion satisfying RPS requirements]

DC – [repeats at length previous comments] Selection criterion "packaged into the EIS"

CHAIR – "Very little detail… am I correct in that?"

[missed answer]

CHAIR – What is the status of the landfall (in the re-routing process)?

CB – There were eight corridors considered, and we included the question "was there a better landfall?"

CHAIR – What information did you seek on the alternative landfalls mentioned in the EIS?

CB – We visited the sites. At Inver there is machair, Glinsk has environmental issues etc.

CHAIR – Is the landfall site part of this application?

KEANE – No. [mentions cliff face at chainage 83.400]… and then…

CHAIR – [interrupts] "So this application is constrained by the current landfall location?"

KEANE – Other landfalls were looked at but only this one (Glengad) has been assessed

CB - [repeats at length previous comments]

CHAIR – "Would you agree that information on other landfalls was limited?"

CB – To a degree, but our considerations were predominantly onshore

CHAIR – Is there any more detail on this in the EIS?

CB - [repeats at length previous comments]

CHAIR – I'm interested in the weighting given to the various criterion ie. safety, cost, constructability etc. "We have the answer to the sum, but no information on how you got the answer"

CB – There was no weighting [repeats at length previous comments] "We had no specific instructions from our client [Shell]" but have records of meetings with them

DC – We chose a qualitative assessment, and stayed away from weighting so as not to be constrained

CHAIR – I would appreciate the extra information [on meetings]. "How did routes 'A' and 'A1' emerge?"

CB - [repeats at length previous comments]

RPS – [interjects] Community input also came into play

CHAIR – What about housing?

CB – Carried out a visual inspection, used information from An Post

CHAIR – How did that inform the process?

CB – It was one area of consideration

CHAIR – What about the community concerns about proximity? I don't get a sense of how that has been allowed for.

CB - [repeats at length previous comments]

DC – Our primary concern was safety, but it did have to be balanced with environmental matters.

CHAIR – Are corridors in the vicinity of Rossport "all the one colour" as regards safety? Was the safety issue not a deciding factor between these corridors?

CB - [repeats at length previous comments]

CHAIR – What were the problems with 'Corridor A'?

CB – It traversed more of the SAC than others

CHAIR – 'Corridor B'?

CB – [speaks at length about steeper slopes, trenching versus tunnelling, larger intervention pits etc.]

CHAIR – What differences are there between the larger tunnel/intervention pit than the current route?

CB - [repeats at length previous comments, mentions "early stages" of development]

CHAIR – Would 'Corridor C' also have pit difficulties?

CB – [admits it would to a certain degree]

CHAIR – "Did you look at all the corridors in a lot of detail?" Residential concerns are considerable

CB – The detail looked at will be provided. Extra detail (eg. construction methods) increased as routing process progressed. "We feel this [route] is the best fit"

CHAIR – Clarity is required (eg. costing considerations etc.) "How would you describe the route from Glengad to the refinery?"

CB - [describes at length general area]

CHAIR – How did the routes compare with regards to programme [work schedule]?

CB – Longer programmes would impact on cost and the environment. Different landfalls would have had significant effects on programme

CHAIR – [asks for rough costings to be provided]

KEANE – We'll have them by either this evening or tomorrow

CHAIR – There are concerns that Environmental Management Plans may not be implemented, because there are a number of bodies involved in the process. How do you see the EMP process evolving [post permission, if granted]?

AGNES McLAVERTY – [refers to Bellanboy and "living document"] Pipeline works are more complicated than refinery. Gas Act consent split into seven phases, landfall works split into three sections. Transport Management Plan develops separately to this

CHAIR – There are concerns about the EMP and TMP being complete and controlled, and not conflicting with the EIS. How do you envisage this?

KEANE – No Plan would be allowed to conflict with the EIS. If difficulties arise a modification may require a different application

CHAIR – EMP (in significant draft form) would help the position of this application, before I complete my final report

KEANE – We would propose to submit the main points of the EMP. Details would normally be drafted with the specific contractors closer to construction. "It is an implementation document"

AMc – I am confident the previous EMPs have upheld any planning requirements

CHAIR – Will the hydrostatic test be carried out on the onshore section in one go?

EK – Yes. Water to be sourced from Bellanaboy

CHAIR – How will the discharge from testing be achieved?

EK – Through the outflow pipe

CHAIR – When will the outflow pipe be available?

AMc – The offshore section is to be constructed this year

CHAIR – What about decommissioning of the pipeline?

AMc – Done through the petroleum lease with DCENR

CHAIR – Are there costs for this?

AMc – The petroleum lease covers this

CHAIR – [on public consultation] How did the differing opinions and non-consulted parties have their views accounted for?

RPS – Our office was open to the public. Views expressed ranged from very positive to very negative. We were very respectful. Not everybody took part.

Brochures were circulated and feedback appreciated. "Everybody knew we were here". Only two public events held during the early stages of consultation. After the eight corridors were announced we departed from the open approach.

A meeting in Kilcommon was mooted, but we decided not to proceed with this as it may have been perceived as a PR exercise. We invited people to private meetings instead, as the process had moved on.

Wednesday 17th June 2009

INSPECTOR'S QUESTIONS - COMPULSORY ACQUISITION

CHAIRMAN – Can you explain the varying widths of the deviation limits?

EAMON KELLY – There is a 40m deviation strip centred on the proposed pipeline route, which may be altered within the 60m wayleave

CHAIR – Will landowners be notified of any deviation that may arise?

EK – Yes. Most likely verbally by the Landowner Liaison Officer

CHAIR – [asks Shell to confirm pipeline distance to potential dwellings in Rossport]

CIARAN BUTLER – Approximately 42m [adjacent to RDX1]

CHAIR – What about any deviation at that location?

CB – That is not anticipated

CHAIR – How does this proximity affect this application?

CB – Other pipelines in Ireland may have similar proximity distances

ESMONDE KEANE – [suggests that planning applications close to the proposed pipeline may be intended to stop the Corrib development] A distance of three metres is within the relevant codes

CHAIR – What is the general position of the applicant regarding future private development near the pipeline?

KEANE – There would be no objections to development outside the 14m permanent wayleave (subject to the specifics of the development)

[observer reminds hearing that the specific planning application referred to in Rossport – by Tom & Ethel Corduff - was made after the 2008 Shell application was withdrawn, but before the current application was submitted]

CHAIR – What about details of marker posts - for walkover surveys - on open ground?

EK – Specifications to be agreed with NPWS, but there should be no problems

CHAIR – Can you confirm that no deviation has taken place on the seaward side of the LVI at Glengad?

KEANE – No deviation

CHAIR – Regarding road improvements in Rossport no CAO has been sought. Why not?

KEANE – I believe landowner agreement has been secured

CHAIR – How do you respond to comments by Brendan Philbin? [landowner in Rossport: chairman reads bullet points of written submission to the Board]

KEANE – Environmental impacts have been catered for in the EIS. For CAO, the Gas Act (as amended) overrides other law. The application proposal is both reasonable and lawful

CHAIR – [draws Shell's attention to five specific written objections to CAO application]

…..

KEANE – [in relation to CAO, the pipeline and refinery have the same status]

Tuesday 23rd June 2009

INSPECTOR'S QUESTIONS - ADDITIONAL

NIGEL WRIGHT – Can you confirm that two methods have been used for the risk transects, societal risk and individual risk?

PHILIP CROSSTHWAITE – Yes

NW – Third party risks only, databases on dry gas?

PC – The issue of "dry" or "wet" gas doesn't impact on third party interference

NW – Are stone roads part of the database?

PC – Both JPK and Advantica conclude there is zero risk from ground movement

NW – So stone roads are not included?

PC – The stone road gives us even more confidence

NW – What proportion of the population is included for population density?

PC – [answer unclear]

NW – What does 10^{-4} and 10^{-5} mean [in TD2]?

PC – Levels of acceptability, essentially ALARP

NW – Can you explain what ALARP means?

PC – "As Low As Reasonably Practicable" within cost boundaries

NW – So there is a trade off between risk reduction benefits and costs?

PC – Yes

NW – At the LVI, what are the risks?

PC – In the region of 10^{-4} and 10^{-5}

NW – What is the accuracy?

PC – Overall accuracy is similar to other (standard) predictions

NW – What is the maximum number of people that could be affected by a single incident?

PC – Numbers vary depending on conditions. We have used a best estimate for frequency, and have been conservative regarding consequence

NW – What about ground movement? Frequency values appear to be randomly included and excluded

PC – Failure figures were used as appropriate

NW – Ground movement is important; the contours change when those figures are included

PC – Values are still within the acceptable region

NW – What about at the LVI?

PC – 100 bar does not affect the nearest house

NW – What about 144 bar?

PC - 100 bar will be the normal operating pressure

NW – And 345 bar?

PC – The valve is not specifically covered by PD 8010

NW – So 345/144 is not covered?

PC – This situation is considered to be so low a frequency as not to be credible (in the view of DNV)

NW – [points out apparent discrepancies on the consequence maps – 144/345 scenario]

PC – The differences are due to the LVI being either open or closed

NW – Should re-routing have taken account of consequences?

CIARAN BUTLER – Re-routing process assumed adequacy of the codes

NW – In relation to the Dutch trip, you never mentioned the new Dutch law for pipelines and treatment facilities. Why?

ESMONDE KEANE – The terminal is outside this application

NW – Considering that flowrate affects the operating pressure, why not rate the project at a lower flow than currently planned to reduce pressure, and therefore reduce risk?

KEANE – [refers to the project Plan of Development, which Shell has classified as a commercially sensitive document]

NW – But why not simply reduce the flow?

STEWART BASFORD – The higher profile is to meet the promised production in the Plan of Development

NW – Promised to who?

KEANE – [shuffles papers and then speaks of high safety standards]

NW – The flow profile can affect ALARP, which is a concern here. [confers with Chairman, then asks about choke wellhead pressure]

SB – [refers again to Plan of Development]

NW – Wouldn't a reduced flow increase safety?

PC – Because of the low frequency there would be no appreciable change

…..

CHAIR – [questioned "net present value of project" referred to in route selection matrix provided to the hearing, 'Corridor C']

SHELL – ['Corridor C' would cost more]

CHAIR – were corridors E, F, G and H ruled out mostly on technical grounds?

CB – [repeats at length previous comments]

CHAIR – How did the broad pipeline corridors shift to minor adjustments within Rossport?

CB – In response to Cassells report and progression of the re-routing process

CHAIR – [questions "documented objection" on 'Corridor B']

CB – [concedes one landowner adamantly refused pipeline through his property]

…..

CHAIR – How did you arrive at an initial corridor of 300 metres?

CB – We just picked a number that could be shown on the map

CHAIR – Did you choose 300 because you anticipated approximately 150 m distance to houses in Rossport?

CB – I can see how it might look like that, but no, 300 was a random figure

Thursday 25th June 2009

CLOSING REMARKS – SHELL

Strategic importance – this application to complete the Corrib gas project

Previous route had intractable difficulties

[Mentions Advantica and Peter Cassells]

"Terminal" already approved [mentions Section 40 of the Gas Act, foreshore license, previous planning permissions]

No other development has been studied as much as Corrib

IPPC license amendment refused – a license review to be applied for instead

Quotes Brid McGarry that objectors are not opposed to gas in the area, but want it demonstrated that this route is up to standard

Planning and Development Acts (as amended) Section 182 C and 182 D, and the Gas Act 1976 allows for route deviation

Security and An Garda Siochana used to keep the peace and prevent damage to property

No retention of unauthorised work associated with this application at Glengad

Unoccupied derelict dwelling (Tom and Ethel Corduff, Rossport). Shell has no objection to or difficulty with proposed renovation

Overlap at Glengad – estimated operating pressure of 90-110 bar (345 not normally expected)

[quotes various laws on deviation limits and transfer of CAO powers to ABP; also mentions extinguishing rights-of-way]

Minimum acquisitions sought necessary for the project. Does not infringe on Tom and Ethel Corduff's property

Removal of peat covered by acquisition, and fully compensatable

No restriction on commonage shareholders seeking CAO

"Commonage framework plan" is not binding

EIS has assessed all relevant matters

All relevant legislation complied with (application, oral hearing, CAO)

Aarhus issues outside the scope of this application – if anyone is not happy they can seek judicial review

Level of detail included and surveys carried out are "extremely robust"

Level of design is advanced enough to assess likely impacts. "Microscopic" assessment unreasonable

Application will minimise environmental impact

Project splitting – all components have been made available for assessment

Environmental Management Plan will not conflict with any permissions or the EIS

"Operation of the pipeline will be in line with best practices"

Confirms pipeline route is "anticipated" to be within indicated deviation limits

SAC – Broadhaven/Blacksod – studies done on environmental impacts. Proposed tunnelling impacts negligible

Site Compound 5 (SC5) not needed

Glengad – "improved grassland" located at the edge of the SAC

Blanket bog fully considered when assessing alternatives

Glinsk and Sruwaddacon Bay options more environmentally damaging

"Safety has at all times been paramount"

[Quotes law extensively on Habitats Directive and European decisions on environmental cases – responding to Dept. Environment comments]

Preservation and reinstatement of peat with inserted stone road not going to negatively impact the SAC. Tunnelling impact negligible. Glengad "improved grassland"

Department of the Environment entirely incorrect in advising the Board to hand over it's authority to Europe (habitats)

Dept. Environment did not engage hydrologist/hydrogeologist … Shell did

Proposed planting of willow in Aughoose amounts to mitigating reinstatement

Sandmartins moved by project – not correct

"Independent verification" of safety aspects engaged by Shell for the EIS. Project will also require departmental approval

Extensive geotechnical studies carried out

Previously successful plans provided for proposed method of construction through peat

Overall decline of the area shown in the census figures

Significant employment – "fifty five people at the terminal" and 76 people indirectly

Project will improve the area for residents and visitors

Cassells quoted – his being escorted in the area by a SEPIL representative just as valid as speaking to the Rossport 5 [extensively quotes statements on Cassells and mediation]

Community funding "wholly appropriate" – unfortunate that people see this as bribery

[claims the vast majority of "local" B&B bookings are from Shell workers]

[suggests gas grid expanded to Mayo towns as a result of Corrib]

Glengad impacts cumulatively assessed since 2001

Application has "limited overlap" with the existing Section 40 consent

Current Section 40 consent still valid

Access track at Glengad within wayleave has been "fully removed"

Project is sustainable. Gas fed into the network, a clean fossil fuel

Suggested changes (to possible conditions) confirmed as acceptable Mayo County Council

Quotes IS 328 (referring to it's use of AS 2885) regarding proximity to housing

QRA fully compliant with highest industry standards

QRA and PIMS fully compliant with the recommendations of Advantica (Chapter 5)

Two houses in Rossport to be removed from use for the life of the project, to attain 140 metres minimum separation distance

Community consultation – people were fully aware of opportunities to engage

No permanent fencing to be installed on Glengad beach

Suggestions of assaults or intimidation carried out by Gardai or security "entirely rejected"

Successful peat removal operations to continue with this application

Ongoing pipeline monitoring planned with DCENR and CER

Inappropriate for ABP to "dictate operating procedures" for the pipeline, or suggest alternative production volumes to those set by DCENR

The Board should be very slow to interfere with the project's strategic importance

GPS monitoring to be installed on the pipeline

Commissioning subject to extensive monitoring by DCENR

Safety review – by TAG – has been completed and delivered to Minister Ryan, and DCENR has confirmed the safety of the project to this hearing

Safety of the community is paramount, but subject to compliance with other constraints

Consequence maps are not representative of risk

Project should be assessed in its entirety

ENDS

APPENDIX A - PERSONNEL

Stewart Basford (SB) - SHELL

Ciaran Butler (CB) - RPS
Corrib Project Manager

Conor Byrne (CB) - SEPIL

Des Cox (DC) - RPS
Operational Director

Philip Crossthwaite (PC) - DNV Energy
Health, Safety & Environmental risk management

John Gurden (JG) - JP Kenny Ltd
Senor Project Manager

Turlough Johnston (TJ) - AGEC Ltd.
Engineering geologist

Esmonde Keane (KEANE)
Senior Counsel to SEPIL

Eamon Kelly (EK) - SEPIL
Senior Onshore Engineer

Darragh Kingston (DK) - RPS
Environment & Waste Section

Conall Mac Aongusa (CMac) - RPS
Traffic and transport planning

Agnes McLaverty (AMc) - SEPIL
Environmental adviser

Martin Nolan (CHAIR)
Chairperson An Bord Pleanala oral hearing

Conor O'Donnell (COD)
Geothechnical Consultant to An Bord Pleanala

Mr Paterson (PAT) - SHELL

John Purvis (JP) - Shell UK Limited
Principal Pipeline Engineer

Nigel Wright (NW)
Pipeline Consultant to An Bord Pleanala

APPENDIX B – ABBREVIATIONS

ABP - An Bord Pleanala

ALARP - As Low As Reasonably Practicable

CAO - Compulsory Acquisition Order

CER - Commission for Energy Regulation

CPI - Centre for Public Inquiry

DCENR - Department of Communications, Energy & Natural Resources

DNV - Det Norske Veritas

EGIG - European Gas pipeline Incident data Group

EIS - Environmental Impact Statement

EMP - Environmental Management Plan

GPS - Global Positioning System

HSA - Health & Safety Authority

HIPPS - High Integrity Pipeline Protection System

LVI - Landfall Valve Installation

NPWS - National Parks & Wildlife Service

PIMS - Pipeline Integrity Management System

QMEC - QMEC Environmental Ltd

QRA - Quantified Risk Assessment

RDX - Road crossing

RPS - Rural Planning Services

SAC - Special Area of Conservation

SEPIL - Shell Exploration & Production (Ireland) Limited

TAG - Technical Advisory Group

TMP - Transport/Traffic Management Plan

APPENDIX C – DOCUMENT LIST

Application Particulars

Environmental Impact Statement

Vol. 1 of 3 - Non Technical Summary & EIS
Vol. 2 of 3 - Book 1 of 5 - Appendix A
Vol. 2 of 3 - Book 2 of 5 - Appendix B – I
Vol. 2 of 3 - Book 3 of 5 - Appendix J – L
Vol. 2 of 3 - Book 4 of 5 - Appendix M (M1)
Vol. 2 of 3 - Book 5 of 5 - Appendix M (M2 - M6) – S
Vol. 3 of 3 - Srahmore Peat Deposition Site EIS - Books 1-3

DRAWINGS

Cover sheet Feb 2009

Schedule of drawings Feb 2009

DG100	Site Location Plan
DG101	Site Layout Plan
DG102	Proposed Construction Plan
DG103	Gas Export Pipeline Overall Route Layout
DG104	Site Contour Plan
	ALIGNMENT SHEETS
DG301	Alignment Plan
DG302	Alignment Sheet 1 of 6
DG303	Alignment Sheet 2 of 6
DG304	Alignment Sheet 3 of 6
DG305	Alignment Sheet 4 of 6
DG306	Alignment Sheet 5 of 6
DG307	Alignment Sheet 6 of 6
	BAY CROSSINGS
DG401	Lower Bay Crossing - Longitudinal Section
DG402	Upper Bay Crossing - Longitudinal Section
DG403	Typical Overview Temporary Launch & Reception Sites
	PEATLAND CONSTRUCTION
DG601	Construction in Areas of Peat: Option 1 Stone Road
DG602	Construction in Areas of Peat: Option 2 Sheetpiling with Floating Stone Road
DG603	Typical Temporary Shore Access Detail
DG604	Typical Working Width (Non-Peat Land Areas)
	CROSSING DETAIL
DG701	Typical Road/Track Crossing Layout & Sections
DG702	Typical Small Ditch Crossing Layout & Sections
DG703	Typical Open Cut Water Crossing Layout & Sections
	STANDARD DETAILS
DG801	Typical Trench and Umbilical Details

DG802	Typical Water Outfall Pipe Vent Valve
	LANDFALL VALVE INSTALLATION
DG2101	Site Plan
DG2102	Above Ground Layout Plan
DG2103	Below Ground Layout Plan
DG2104	Above Ground Cross Sections
DG2105	Above & Below Ground Cross Sections
DG2106	Site Area Long Sections
DG2107	Details (Sheet 1 of 2)
DG2108	Details (Sheet 2 of 2)
DG2109	Landscape Plan

EIS - Addendum Report - May 2009

Part 1 / Part 2 / Part 3

Oral Hearing Brief's Of Evidence

1. Project Overview
2. Project Overview_ Visuals
3. Route Selection Process and Alternatives Considered
4. Route Selection Process and Alternatives Considered_Visuals
5. Planning and Development Policy Context
6. Planning and Development Policy Context_Visuals
7. Construction
8. Construction_Visuals
9. Geotechnical (including peat stability and stone road construction)
10. Geotechnical (including Peat Stability & Stone Road Construction)_Visuals
11. Pipeline Integrity and Design
12. Pipeline Integrity and Design_Visuals
13. Quantitative Risk Assessment
14. Quantitative Risk Assessment_Visuals
15. Landfall Valve Installation
16. Landfall Valve Installation_Visuals
17. Noise and Vibration
18. Noise and Vibration_Visuals
19. Srahmore Peat Deposition Site
20. Srahmore Peat Deposition Site-Visuals
21. Archaeological, Architectural Heritage & Cultural Heritage
22. Archaeological, Architectural Heritage & Cultural Heritage_Visual
23. Eco-hydrology/Eco-hydrogeology
24. Eco-hydrology/Eco-hydrogeology_Visuals
25. Terrestrial Ecology
26. Terrestrial Ecology_Visuals
27. Community And Socio-Economic Issues
28. Community And Socio-Economic Issues_Visuals
29. Landscape and Visual
30. Aquatic and Marine Environment
31. Aquatic and Marine Environment_Visuals

32. Cumulative Impact Assessment
33. Traffic and Roads
34. Traffic and Roads_Visuals

Additional Information

1. AGEC Stone Road Stability Report - Part 1 / Part 2 / Part 3
2. Clarification of Route Development Process - Cover Note
   - Final Route Evaluation_Feb 08
   - Reduced Route Evaluation Jan 08
   - Evaluation of all Corridors_Sep 07_Sheet 1
   - Evaluation of all Corridors_Sep 07_Sheet 2
   - Evaluation of all Corridors_Sep 07_Sheet 3
   - Evaluation of all Corridors_Sep 07_Sheet 4
3. Consequence Impact Contour Maps_South- Cover Note
   - Figs 5.1 - 5.4
   - Figs 6.1 - 6.4
   - Figs 7.1 - 7.4
4. CAO MAP WL(2)027A03
5. Corrib Onshore Pipeline Response to NPWS Q12
6. DNV 2004-2009 Risk Data Comparision
7. Environmental Management Plan
8. ARUP Report - Review of Glinsk as a Possible Landfall and Terminal Location
9. JPKenny-Stone Road Settlement Analysis
10. Maximum length of a single length offshore umbilical
11. Overview of Works at Terminal Site
12. Noise & Vibration- Requested Additional Information
13. Pressure Regime: Subsea to BGE
14. Proximity of Pipeline Route to Local Housing
15. Road Construction Details and Site Transportation
16. Security Activity Profile during Construction and Associated Impacts
17. Summary of Corrosion Management of Wet Gas Pipelines
18. Surface Water Management & Monitoring Proposals
19. Haul Road Pavement Design and Road Cross Section-Supplementary Information

These documents can be downloaded from www.corribgaspipeline.ie