

**Applicant**  
**1<sup>st</sup> affidavit of Pat Swords**  
**? 2010**  
**2010 No. ?**

**IN THE HIGH COURT OF**

**(JUDICIAL REVIEW)**

**IN THE MATTER OF AN APPLICATION BY**

**PAT SWORDS**

**AND ?**

**FOR JUDICIAL REVIEW**

**AND IN THE MATTER OF A DECISION OF THE**

**AN BORD PLEANALA,**

**DATED ? 2010**

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**AFFIDAVIT OF PAT SWORDS**

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I, Pat Swords, aged 21 years and upwards, make Oath and say as follows:-

1. I am a Principal Process and Environment, Health & Safety Consultant. I hold an honours degree in Chemical Engineering and am a Fellow of the Institute of Chemical Engineers, a Chartered Environmentalist, Environmental Auditor and Member of the Institute of Environmental Management and Assessment. I have 24 years of industrial experience in the design and regulatory compliance of facilities in the pharmaceutical, chemical, medical devices, food and drink, energy and general manufacturing sectors. Since 1999 I have worked extensively on EU Technical Aid projects in Central and Eastern Europe implementing the EU Environmental Acquis, the 300 or so Directives in the environmental sphere. In particular I was responsible for training regulators, industry and Non-Governmental Organisations (NGOs) on the

principles of Integrated Pollution Prevention and Control (IPPC) in Romania, Macedonia, Croatia and Belarus. In Slovenia, Romania, Croatia and Malta, I was also responsible for training regulators, industry and Non-Governmental Organisations on the Control of Major Accident Hazards (Seveso II) Directive. I have also served as a technical consultant to the Asian Development Bank (ADB) and the World Bank.

2. I have been instructed by.
3. In doing so, I have assessed this matter independently and I am aware of my responsibility to this Honourable Court. The matters dealt with below are material to all three.

#### **(A) ENVIRONMENTAL REGULATION IN IRELAND**

4. It is instructive to consider the principles of environmental regulation within the context of the Environmental Acquis, which is the body of EU legislation adopted in this sphere to date and comprises about 300 Directives, which interact and compliment each other. Note: The Acquis Communautaire is the body of EU legislation to date, which has to be implemented by a candidate Member State before accession.
5. These Directives in the Environment Sphere are not simply related to nature protection but also address energy, transportation, agricultural practices, building quality, water, waste, air quality, pollution control, industrial risk, public participation and access to justice, etc. As the World Bank says about their implementation in the Balkans: “Adoption of the Acquis introduces an approach to environmental governance that creates stronger ownership and an opportunity for citizens to influence government decisions, more transparency and local responsibility for natural resources; improved project programming and planning capacity; and a more predictable legal framework for foreign and private sector investors<sup>1</sup>”. (Marked **PS1** at the time of swearing)

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<sup>1</sup><http://siteresources.worldbank.org/INTECAREGTOPENVIRONMENT/Resources/511168-1191448157765/Chapter1.pdf> Note: I, Pat Swords, was the IPPC International Expert involved with the Macedonian IPPC project referenced on page 29.

6. Unfortunately Ireland, although it has less than 1% of the EU-27 population, has the worst compliance record with the EU Environmental Acquis (23% of the Article 260 cases, see below). Currently there are 34 cases against the Irish State for non-compliance with the Environmental Acquis<sup>2</sup>. However, 14 of these are for infringements reflecting a judgement by the European Court of Justice (Article 260 cases). Under these circumstances the European Commission has powers to refer a case to the European Court of Justice again if a Member State fails to comply with an earlier judgement. In such cases, the Commission can and does ask for financial penalties to be imposed. Ireland's 14 cases in final phase related to infringements of the Environmental Acquis must be held in context with the fact that only 9 times has the European Court of Justice levied a fine on a Member State with regard to offences in all sectors of European law.
7. With regard to the above on the 18<sup>th</sup> March the EU Commission issued a final warning to the Irish State with regard to Access to Justice – Case C-427/07. Note: Directive 2003/35/EC requires members of the public concerned have access to a review procedure before a court of law or other independent and impartial body established by law to challenge the substantive or procedural legality of decisions, acts or omissions subject to the public participation provisions of the Directive. Any such procedure shall be fair, equitable, timely and not prohibitively expensive. A further case against Ireland in the European Court of Justice, C-50/09, relates directly to An Bord Pleanála and the Environmental Protection Agency failing to fulfil the requirements of Articles 2, 3 and 4 of the Directive on Environmental Impact Assessment (85/337/EEC as amended), i.e. failure to assess environmental impacts of a project and failure of the relevant decision makers in different agencies to coordinate effectively.
8. There is no doubt that the above examples of a culture of non-compliance are related to the failure of the Irish Administration to ratify the United Nations Economic Commission for Europe (UNECE) Aarhus Convention on Access to Information, Public Participation in Decision Making and Access to Justice on Environmental Matters. We are essentially alone in Europe with regard to failure to ratify the convention. Indeed the State is not in a position to ratify the Convention as it does

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<sup>2</sup> <http://ec.europa.eu/environment/legal/law/statistics.htm>

not provide the necessary measures related to Access to Justice. With regard to the European Commission's inventory of EU Member States measures on access to justice in environmental matters<sup>3</sup>, it was found with regard to Ireland: "In summary, in order to render itself compliant with Article 9(3) obligations, Ireland certainly needs to provide administrative procedures for enforcement of environmental law. It is strongly arguable that Ireland also needs to address the costs of instituting judicial enforcement mechanisms".

9. In September 2007 the EU had to draft a note setting down in writing certain explanations given verbally, such that Ireland will be obliged to respect the commitments arising from the Convention where they concern provisions falling within the competence of the Community. Nevertheless, this obligation has an impact solely on Community legal order.
10. For both Irish and Foreign investors, the capricious behaviour of Irish officials, the non-compliances with the Environmental Acquis and the failure to provide Access to Justice are an ever increasing disincentive, when decisions with regard to the location of future development, in particular industrial development, are under consideration. Some examples are:
  - StatoilHydro, who have a share in the Corrib Development stating in 26<sup>th</sup> August 2009 (Irish Times): "When we look at political risk with practical consequences to project progress then Ireland unfortunately stands out as an example<sup>4</sup>". (Marked **PS2** at time of swearing).
  - The Irish Academy of Engineering in their Review of Ireland's Energy Policy, 2009, which formed a Submission to the Joint Oireachtas Committee on Climate Change and Energy Security, stated<sup>5</sup> (Marked **PS3** at time of swearing): "It is difficult to have any confidence in the ability of Ireland's planning, regulatory and legal framework to facilitate the delivery of new energy projects on time or on budget. Large infrastructural projects in Ireland cannot be planned and completed in a predictable economic timeframe. The risk return calculations for such projects are currently little better than a lottery. Whether it is the experience with the

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<sup>3</sup> [http://ec.europa.eu/environment/aarhus/study\\_access.htm](http://ec.europa.eu/environment/aarhus/study_access.htm)

<sup>4</sup> <http://www.irishtimes.com/newspaper/finance/2009/0826/1224253265558.html>

<sup>5</sup> [http://www.oireachtas.ie/viewdoc.asp?fn=/documents/Committees30thDail/J-Climate\\_Change/Submissions/IAE220091002.pdf](http://www.oireachtas.ie/viewdoc.asp?fn=/documents/Committees30thDail/J-Climate_Change/Submissions/IAE220091002.pdf)

Corrib project, construction of wind farms or delivery of new electrical transmission infrastructure (or indeed Ireland's road infrastructure), there is huge uncertainty about the final delivery date and overall cost which is not the case in other jurisdictions. Indeed following what can only be described as a debacle in relation to the Corrib field, Ireland is viewed as a high risk location for such large scale international investment precisely because of the unpredictability of its permitting processes".

- Covanta, the US Company delivering the Dublin City Waste to Energy Plant, has had to request the assistance of the US Ambassador due to continued obstruction related to its foreshore licence. It has made it clear in the public domain that it is considering legal action against the Irish Authorities<sup>6</sup>. (Marked **PS4** at time of swearing).
- UNECE, from personal communication with Fiona Marshall, Environmental Affairs Officer, is extremely concerned about the level of non-compliance with environmental legislation in Ireland and the failure to ratify the Aarhus Convention (Marked **PS5** at time of swearing).

## **(B) GROUNDS FOR A JUDICIAL REVIEW**

11. The Planning and Development (Strategic Infrastructure) Act of 2006 includes two grounds under which Section 50 leave for a Judicial Review may be granted, namely; the applicant has a substantial interest in the matter which is in the subject of the application, or; where the decision concerned is a development which may have significant effects on the environment and the applicant is a body or organisation, the aims or objectives of which relate to the promotion of environmental protection.
12. Firstly as I have clarified in the first paragraph of this Affidavit, I make my living in the design and regulatory compliance of facilities in the pharmaceutical, chemical, medical devices, food and drink, energy and general manufacturing sectors. There has been an enormous downturn in direct inward investment related to industrial development in the last three years (*data on this can be supplied*- Marked **PS6** at time of swearing). There is no doubt that the problems above related to regulatory approval, of which the Corrib development is an extreme example, have acted as a

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<sup>6</sup> <http://www.independent.ie/national-news/us-poolbeg-firm-wants-gormley-to-stand-aside-2280588.html>

major disincentive to investment in this country. This has caused huge financial and career losses to those engaged in industrial development in the Irish Republic.

13. As I am a specialist in the Environmental Acquis and their implementation, I simply am now longer in a position to recommend to companies that they should consider Ireland as an investment location or to undertake a regulatory application here on their behalf. Time and time again, companies that have come here in good faith have been treated badly by the Irish Administration, which has refused to address the proper application of the legislation on the statute books. An example being the case of Biodiesel Production Ireland, which I represented over the period in excess of three years, which it took to progress a very simple project through An Bord Pleanála's procedures (Marked **PS7** at time of swearing). Considerable time and financial investment has to be made to bring a project to the planning stage. A huge pool of Irish manpower is dependent on the successful output of that process in order to receive a go ahead in terms of detailed design, construction and hand over of a finished operating facility. Massive personal stress occurs to those responsible for the application process when regulators, such as in An Bord Pleanála, fail to deal with the application in a professional manner and instead obstruct the project, in doing so even assuming powers that have not been given to them in the legislation, for political or other purposes. In effect I no longer have a financial livelihood left in Ireland and have been forced to make my career development elsewhere.
14. Secondly for more than two years I have campaigned as a concerned citizen for the proper implementation of EU legislation related to Environmental Protection (the Environmental Acquis). Initially in mid 2008 this related to the improper reporting of the Irish media on environmental matters, in particular the Corrib development, see correspondence from the Head of Cabinet of the Vice President of the EU Commission and Directorate General Environment, Directorate A- Communication, Legal Affairs and Civil Protection (Marked **PS8** at time of swearing). On the 13<sup>th</sup> October 2008 I submitted a paper on the folly behind Ireland's wind energy programme to the Joint Oireachtas Committee on Climate Change and Energy Security (marked **PS9** at time of swearing). In June 2009 I submitted a further Submission to the Joint Oireachtas Committee on Climate Change and Energy

Security<sup>7</sup> (marked **PS10** at time of swearing). In January 2010 the EU Ombudsman, who does about 300 detailed investigations a year, started a detailed investigation (2587/2009/JF) in my name related to the infringements of Environmental and Energy Legislation in Ireland (Marked **PS11** at time of swearing). In March 2010 the EU Commission opened a formal complaint investigation (CHAP (2010) 00645) in my name related to compliance with EU Environmental Legislation. Note about 2,000 complaint files are opened each year of which about 50% lead to proceedings against Member States and 10% to cases in the European Court. In November 2009 I contacted the Garda Bureau of Fraud Investigation related to the systematic failures of senior elected and non-elected officials to comply with the legislation on the statute books and a complaint file (FB11/242.09) was opened in my name (Marked **PS12** at time of swearing). Note: The Department of the Environment in their reply my Access to Information on the Environment Request (AIE/2010/025) of the 26<sup>th</sup> October 2010, confirmed that there are no additional requirements prescribed by the Minister under Section 37 (4) (e) of the Planning Acts 2000 to 2010 in “which a body or organisation of the foregoing kind in order to make an appeal”. Furthermore “there are no current plans to amend the same”.

15. With regard to the Oral Hearing for the Corrib Project held in August and September 2010, for a number of months prior to the Oral Hearing I had been in regular contact with the environmental NGO Pro Gas Mayo. In his Submission to the Oral Hearing and statement on the final day, Brendan Cafferty Secretary of Pro Gas Mayo, clearly outlined the principle points contained within this affidavit, based on the briefing I had supplied him with regard to the non-compliances with EU Environmental Legislation by An Bord Pleanala.

### **(C) GROUNDS FOR CONTENTING THAT THE DECISION IS INVALID**

16. The grounds for the above are based on the fact that neither (a) the requirements of the Environmental Acquis for public participation in decision making were completed nor (b) was the basis for refusing permission for the 5.64 kilometre length of pipeline in their letter of 2<sup>nd</sup> November 2009 (Marked **PS13** at time of swearing), due to it being considered unacceptable, justified under existing EU and national

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<sup>7</sup>[http://www.oireachtas.ie/viewdoc.asp?fn=/documents/Committees30thDail/J-Climate\\_Change/Submissions/document1.htm](http://www.oireachtas.ie/viewdoc.asp?fn=/documents/Committees30thDail/J-Climate_Change/Submissions/document1.htm)

legislation related to risk and Land Use Planning. In fact by applying decision making criteria based solely on consideration of hazard rather than risk, An Bord Pleanála was acting Ultra Vires.

17. In many respects this can be better explained by highlighting that the application of EU Legislation is based on the application of 'hard law' and 'soft law'. Soft law is the term applied to EU measures, such as guidelines, declarations and opinions, which, in contrast to Directives, Regulations and Decisions, are not binding on those to whom they are addressed. However, soft law can produce some legal effects. The 'hard law', such as the Directives, outlines the procedures that have to be followed and the essential criteria that have to be met. However, the legislator is not in a position to define the compliance criteria for every situation that may arise, particularly given the diversity that is in Europe. Therefore the principles of 'local conditions' and 'subsidiarity' apply, where 'soft' non-binding policy instruments, such as technical guidance issued by the EU and National organisations and standards set by the European Standards Organisations, are applied at Member State level by regulators, with their inherent flexibility, to determine precise permitting requirements for individual facilities and projects based on local economic, environmental and technological circumstances.
18. The situation with the Corrib project, as will be explained later in this affidavit, was that the 'benchmarks' for compliance of such a project are well established at EU and Member State level, in particular given that over a hundred thousand kilometres of high pressure gas pipelines already criss-cross Europe. These benchmarks were clearly presented by the developer in his application, but were ignored by An Bord Pleanála in their decision making. Furthermore there was a total failure by An Bord Pleanála to follow the procedural requirements specified in EU legislation for a 'competent authority' in this role under the Directive on Environmental Impact Assessment (85/337/EEC as amended). Finally, in rejecting the original proposal for the 5.4 km pipeline in November 2009, An Bord Pleanála stepped outside the 'benchmarks' for compliance of such a project established within EU 'hard' law and 'soft' law, i.e. based on risk (a combination of frequency and consequences) and applied one based on no published legislation, in which the criterion of compliance was solely consequence related (hazard).



19. In having to comply with this new criterion, enormous additional costs, (in the order of €200 million, will have to be carried by the project, 25% of which will be lost revenue which would otherwise have gone straight to the Irish State. Furthermore a precedent has been established in which An Bord Pleanála conducts its decision making outside the EU Environmental Acquis, utilising benchmarks for compliance which are outside of published legislation. Companies are simply not going to invest in this jurisdiction under such circumstances.

#### **(D) FAILURE TO COMPLY WITH ACCESS TO INFORMATION AND PUBLIC PARTICIPATION IN DECISION MAKING**

20. The three pillars of the Aarhus Convention are Access to Information, Public Participation in Decision Making and Access to Justice. Access to Information is implemented by Directive 2003/4/EC, enacted into Irish legislation by S.I. No. 133 of 2007, which requires both access on request and active and systematic dissemination of information on the environment to the widest systematic availability. Public Participation in Decision making is implemented by Directive 2003/35/EC, the compliance of which is subject to proceedings between the Irish State and the European Commission in the European Court of Justice.

21. By mid-2009 it was increasingly clear to me from the reports in the media that the regulatory approval related to the relocation of the Corrib gas pipeline from its original routing was not progressing in a satisfactory manner. While I was aware of the Aarhus requirements from my work on the EU technical aid projects, I had not until mid 2009 sought to exercise my Aarhus rights as an EU citizen. Unfortunately when I did so I was obstructed. The Decision CEI/10/0002<sup>8</sup> of the 16<sup>th</sup> July 2010 by the Commissioner of Environmental Information related to requests under the Access to Information on the Environment Regulations (S.I. No. 133 of 2007) to An Bord Pleanála on the 22<sup>nd</sup> September 2009 and the 13<sup>th</sup> December 2009 (Marked **PS14** at time of swearing). The fact that I was refused access to information on request and finally had to go to appeal (on payment of €150) to the Commissioner of Environmental Information demonstrates the non-compliance of An Bord Pleanála with the terms of Directive 2003/4/EC.

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<sup>8</sup> <http://www.ocei.gov.ie/en/DecisionsoftheCommissioner/Name,12502,en.htm>

22. The conduct of An Bord Pleanála is regulated by the Environmental Acquis. The Mission Statement of An Bord Pleanála is clearly presented on their website in which the word legislation does not feature once. Sustainable Development is mentioned, but this is not an arbitrary term which grants unlimited powers in its interpretation. For instance we are now currently at the end of the EU 6<sup>th</sup> Environment Action Programme, which runs from 2001 to 2010. The 5<sup>th</sup> Environment Action Programme from 1993 to 2000 defined the Community's concept of sustainable development and started a shift from purely regulatory measures to market led (fiscal) measures – sustainable development being defined as *“meets the needs of the present without compromising the ability of future generations to meet their own needs”*. The Environmental Acquis are the legal implementation of sustainable development. Under Directive 2003/4/EC on Access to Information on the Environment, Articles 1, 2 and 7 require the widest possible systematic availability and dissemination to the public of environmental information. This environmental information includes administrative measures, policies, legislation, plans, programmes, environmental agreements, measures or activities designed to protect environmental elements.
23. Oral Hearings, which are sometimes called public debates in other Member States, have a role in the legislation to act as a clarification exercise to the public. The authorities in other Member States are competent in the relevant subject matter, the requirements of the legislation and their duties in disseminating this information to the public. In contrast in Ireland, Oral hearings are a disjointed rambling exercise without structure or form, the Corrib Oral Hearing taking 19 days in May 2009 and a further six weeks in August / September 2010 (*affidavit from others on how disjointed oral hearings are in Ireland versus other Member States can be provided*). If we consider the Corrib Oral Hearing in May, the Submission of Brendan Cafferty of Pro Gas Mayo on my behalf to the Appeal CEI/10/0002 with the Commissioner of Environmental Information (Marked **PS15** at time of swearing), demonstrates how no effort was made by An Bord Pleanála to clarify to those present the legislative basis on which the decision related to the project would be made. A clear breach of the dissemination requirements of Directive 2003/4/EC.
24. With regard to the Access to Information on the Environment Request to An Bord Pleanála originally made on 22<sup>nd</sup> September 2009, the first two requests related to:

- a) The legislative basis for the recent Oral Hearing of circa 19 days on the Corrib pipeline rerouting.
- b) The procedures for conducting an Oral Hearing to this legislative basis, such as choice of staff, training of staff, specific areas of legislation to be addressed, areas outside of the legislation that should not be addressed, recommended time frame for oral hearing, relationship to competent authorities for Environmental, Safety, etc.

25. With regard to the reply finally received on the 20<sup>th</sup> January 2010 (Marked **PS16** at time of swearing), the legislative basis with regard to (a) was the Planning and Development Act 2000 as amended. For (b) the complete records were An Bord Pleanala's Guidelines on Procedures on Oral Hearings (last modified on the 12<sup>th</sup> December 2007). This not only demonstrated that there no proper training and selection requirements for inspectors for such an Oral Hearing as Corrib involving safety and environmental issues, but there was no mention of the requirement of the Authorities to actively and systematically disseminate the specific environmental information, such as is specified in Article 2 of Directive 2003/4/EC and includes administrative measures, policies, legislation, plans, programmes, environmental agreements, measures or activities designed to protect environmental elements.

26. In addition there was no mention of the requirement under Directive 2003/35/EC that the main reports and advice issued to the competent authority have to be made available to the public, rather an arbitrary statement about documentation submitted to the Bord in which there is no clarification as to what are the main reports and advice under which the decision is being made. Note: The Directive on Public Participation in Decision Making (2003/35/EC) is clear in that for a project falling under the remit of the Environmental Impact Assessment Directive (85/337/EEC) that the following is made available to the public concerned; "in accordance with national legislation, the main reports and advice issued to the competent authority or authorities at the time when the public concerned is informed". This is in addition to the documentation provided by the developer and is required to enable the public concerned to "prepare and participate effectively in environmental decision-making". In conclusion An Bord Pleanala simply did not address the questions asked in (b).

27. With regard to the request to An Bord Pleanála originally made on 22<sup>nd</sup> September 2009 the third question related to: “The specific approach of the Board to moving from a previous system of decision making based on Patronage to one which implements the Environmental Acquis”. An Bord Pleanála refused to answer this information request, but later stated to the Commissioner for Environmental Information in her investigation (CEI/10/0002 (**PS14**)) that: “The decisions maker’s response on behalf of the Board was that, having consulted with colleagues and checked the Corrib case, he is satisfied that the Board does not hold records indicating that it complies with the Environmental Acquis”.
28. On the 13<sup>th</sup> December 2009 (**PS14**) my Access to Information on the Environment Request related to: “The recent decision of the Board to refuse permission for a 25 mm thick steel gas pipeline of 500 mm diameter clearly did not follow accepted engineering practices for risk associated with thick walled large diameter pipelines, such as is established in the attached risk methodologies of the Dutch Authorities (RIVM). Furthermore if one considers that there were eight accidents involving fatalities with the wind energy industry in 2008 alone and established risk contours for the population in the vicinity of these turbines have been established, see summary of Dutch (Novem) guidance attached, then why are the Planning Guidelines for Wind Turbines developed in conjunction with An Bord Pleanála saying in Section 5.7 and other sections the very opposite? Furthermore it is clear, such as in Dundalk, that turbines have been erected in Ireland in close proximity to populated areas. There is therefore no consistent approach taken by the Board to the considerations of costs, benefits and alternatives in relation to risk and land use planning and decisions are clearly been made on what suits political considerations. I am therefore requesting the parameters the Board applies to assessing risk and determining acceptance criteria”.
29. To clarify the above, An Bord Pleanála had refused planning for the 5.64 km length of pipeline in their letter of 2<sup>nd</sup> November claiming it was of unacceptable risk, this will be dealt with later in this affidavit, and in doing so using no facts or figures to justify this position. If we consider the huge political drive for wind energy in Ireland, along with An Bord Pleanála’s approval of over 1,500 wind turbines, it is internationally recognised that there is a risk of a fatality of one in a million ( $1 \times 10^{-6}$ )

in a 144 m zone around a 2 MW wind turbine. This was established in the Netherlands in 2002 by the relevant Competent Authority Novem<sup>9</sup>. However, the Irish Planning Guidelines for Wind Turbines updated in June 2006 in conjunction with An Bord Pleanala<sup>10</sup> are clear in Section 5.7 that “there are no specific safety considerations”. Clearly there was no consistent technical basis on which risk was being assessed and land use planning decisions made in Ireland. However, An Bord Pleanala refused to answer this question, but later stated to the Commissioner for Environmental Information in her investigation (CEI/10/0002 (**PS14**)) that: “The decisions maker’s response on behalf of the Board was that, having consulted with colleagues and checked the Corrib case, he is satisfied that the Board ...did not, prior to the Corrib oral hearing, commission any information on risk parameters or criteria from its own inspectorate or from external consultants”.

30. A further Access to Information on the Environment Request was submitted by myself on the 17<sup>th</sup> July 2010 (Marked **PS17** at time of swearing) and a reply received from An Bord Pleanala on the 29<sup>th</sup> July 2010 (Marked **PS18** at time of swearing). This demonstrated that; “the criteria for the making of a decision by the Board is set out at section 182D of the Planning and Development Act 2000, as amended, which provides for the Board to take into consideration the following:

- (a) The environmental impact statement, any submissions or observations made in relation to the application and any further information submitted.
  - (i) The likely consequences for proper planning and sustainable development and the likely affects on the environment of the proposed development,
  - (ii) The report and recommendation of the persons conducting any oral hearing”.

31. The above clearly indicates that under Irish legislation there are no “main reports and advice issued to the competent authority or authorities at the time when the public concerned is informed”. Indeed there was a refusal by An Bord Pleanala to supply in this request (**PS17**) in advance of the resumed Corrib oral hearing any information issued by other competent authorities or produced by themselves, such as in regard to risk and Natura sites, which they would use to make their decision.

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<sup>9</sup> <http://www.ecn.nl/docs/library/report/2004/rx04013.pdf>

<sup>10</sup> <http://www.environ.ie/en/Publications/DevelopmentandHousing/Planning/FileDownload,1633,en.pdf>

32. For the Special Area of Conservation through which the proposed pipeline would be routed<sup>11</sup> (Marked **PS19** at time of swearing) no documentation was made available when requested on the 17<sup>th</sup> July (**PS17**), despite designation in 2001 and a requirement under the EU Habitats Directive (92/43/EEC as amended) to establish as soon as possible and within six years at most, priorities and the necessary conservation measures involving appropriate statutory, administrative or contractual measures which correspond to the ecological requirements of the natural habitat types and the species present on the sites. The same is true for the relevant Special Protection Area affected by the proposed development<sup>12</sup> (Marked **PS20** at time of swearing), which was designated in 1995. Note for the Habitats Directive 92/43/EEC and the Birds Directive 79/409/EEC, the European Communities (Natural Habitats) Regulations of 1997 established the Local Authorities, An Bord Pleanála and the Environmental Protection Agency as the competent authority. It is completely unclear from the reply of the 29<sup>th</sup> July 2010 (**PS18**) what criteria An Bord Pleanála were going to use to assess the impact of the proposed development on these specific Natura sites.

**(L) An Bord Pleanála Request for Further Information and Revised Environmental Impact Statement (EIS) of 2<sup>nd</sup> November 2009**

33. This request (Exhibit **PS13**) effectively refused planning permission for the pipeline as submitted by the Developers SEPIL. It is important to review briefly the context of this pipeline. In May 2005, following the granting of a court injunction, five local residents, the Rosspoint Five, were held in contempt of the High Court for refusing to allow SEPIL entry onto their land to construct the onshore pipeline and they were then committed to jail. In response to safety concerns expressed by members of the local community, the Irish Government appointed international consultants, Advantica, to conduct an independent safety review of the onshore pipeline. This report was then published in May 2006. In their report, Advantica concluded, “proper consideration was given to safety issues in the selection process for the preferred design option and the locations of the landfall, pipeline and terminal”. SEPIL accepted all of the Advantica recommendations and agreed to limit pressure in the onshore section of the pipeline to 144 times atmospheric pressure or below. For over

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<sup>11</sup> <http://www.npws.ie/en/media/Media,3954,en.pdf>

<sup>12</sup> <http://www.npws.ie/en/SPA/004037/>

a year work had been suspended by SEPIL on the on-site terminal while negotiations and mediations were being completed with the local community. SEPIL also agreed to reroute the on-shore pipeline not because there were technical or legislative reasons but out of political goodwill. The new route was identified in April 2008 following a 14-route selection process involving 11 months of public consultation. The modified route doubled the distance from occupied housing and the pipeline's design pressure was now less than half of the original design pressure. Applications associated with these route modifications were lodged with the relevant statutory bodies in February 2009. An Bord Pleanála then conducted a 19 day oral hearing on the project in May 2009.

34. However, An Bord Pleanála stated in their letter of 2<sup>nd</sup> November that: “The design documentation for the pipeline and the quantified risk analysis (QRA) provided with the application does not present a complete, transparent and adequate demonstration that the pipeline does not pose an unacceptable risk to the public”. Directive 85/337/EEC as amended requires in Article 9 that with regard to a decision to grant or refuse a development consent the competent authority shall make available to the public the following information: “having examined the concerns and opinions expressed by the public concerned, the main reasons and considerations on which the decision is based, including information about the public participation process”.
35. The statement above by An Bord Pleanála is certainly the personal opinion of those that wrote it, but at no stage is it clarified by information related to the ‘main reasons and considerations’ which justified the decision within the context of the ‘hard’ and ‘soft’ law. In fact not a single fact or figure was supplied, nor reference to a single technical code for the design or assessment methodology for such installations. Furthermore, as has been highlighted already in Section (D) with Exhibit **PS14**, An Bord Pleanála clearly didn’t have any basis established for assessing risk.
36. As regards the Quantified Risk Analysis (QRA) not presenting a “complete, transparent and adequate demonstration that the pipeline does not pose an unacceptable risk to the public”, it is clear from Section (H and K – in the Appendix), that the ability to do such a QRA to achieve that goal of presenting a ‘complete, transparent and adequate demonstration’ simply does not exist. Furthermore if

somebody was to state that such a methodology was available, they would either be lying or plainly incompetent in the complex subject matter.

37. With regard to the design of the pipeline as was mentioned already in Section (C), over a hundred thousand kilometres of high pressure gas pipelines criss-cross Europe. See Fig. 4 at end of this affidavit. High pressure pipes have effectively been utilised by mankind for several centuries, a gun after all being a high pressure pipe that can take enormous pressures in the phase just after the explosion and prior to the projectile being hurtled out the open end. Indeed the technology was so well developed by 1916 that the German Big Bertha guns were lobbing high explosive shells 110 km into the centre of Paris. Power stations have also operate for years on end at steam pressures several times higher than what will occur in the Corrib pipeline as do hydraulic systems to be found in every day occurrences, such as construction equipment. In layman's terms the Corrib pipeline is effectively a gun barrel; it is 500 mm in diameter and 27 mm (1 inch) thick. It can easily hold a pressure of 500 times atmospheric pressure, more than three times its maximum operating pressure. Note: Most of the red pipelines highlighted in Fig. 4 are of 9 mm thickness and operate at about two thirds the operating pressure of the Corrib pipeline. The degree of 'safety' is simply related to the quality of engineering design, construction and operation. That the pressure is higher and as a result the intrinsic hazard somewhat greater, is not really relevant to the final conclusion, after all is a rifle man with his little gun safe and an artillery man with a big howitzer in mortal danger? This illustrates once again that it is risk and not hazard that counts – as is prescribed in the legislation.

38. Why do other countries not have long drawn out regulatory approval processes for the huge numbers of pipelines that criss-cross their territory? If we consider Germany they have since the mid-seventies defined the 'Stand der Technik', i.e. the state of technology, for high pressure gas pipelines in a series of technical regulations (TRGL). These were reviewed in the last few years and combined with those for long distance pipelines carrying oil and other chemicals (TRFL). If one looks at what was submitted by SEPIL to An Bord Pleanála, it is clearly the same as is required by the TRFL. Why wouldn't it be, the EU Directives applicable, such as for Environmental Impact Assessment and design and approval of Pressure Equipment, are identical.



Indeed the European Standards relating to the technical details of design, construction and operation of the pipe work are all the same, after all that is what everybody manufacturers to and they are where necessary harmonised to the relevant Directives. The difference in Ireland being that An Bord Pleanala would not accept the technical details submitted by SEPIL or on the Advantica report and clearly refused to provide any technical criteria on which their decision would be made, a complete failure of their duties under Directive 2003/35/EC (Public Participation – Pillar II).

39. Furthermore in their statements on the 2<sup>nd</sup> November An Bord Pleanala clearly interchanged hazard and risk, not understanding, as has been clarified in the previous Sections, that the legislation is based on assessment of risk and appropriate risk mitigation. Hazard is purely a preliminary identification step in the assessment of risk. It is not as if this had not been explained in detail to them in the documentation submitted and the presentation in the oral hearing, it had in great detail, including the Health and Safety Authority's own approach to Land-Use Planning, which implements the EU Guidance referred to previously. Yet despite this it was stated:

- “Adopt a standard for the Corrib upstream untreated gas pipeline that the routing distance for proximity to a dwelling shall not be less than the appropriate hazard distance for the pipeline in the event of a pipeline failure. The appropriate hazard distance shall be calculated for the specified pipeline proposed such that a person at that distance from the pipeline would be safe in the event of a failure of the pipeline”.

40. From a legal perspective what did this mean? Safe, as has been clearly outlined in the previous section, is a layman's term that is completely open to interpretation and in a legal perspective relates solely to an acceptable level of residual risk as determined by 'hard' and 'soft' law. A legal basis that An Bord Pleanala chose to overrule and in addition they refused to provide their relevant risk criteria documentation on request. Furthermore SEPIL and Advantica had already completed the necessary risk assessment calculations to the recognised methodologies and had determined that the criteria for adequate separation distance from the pipeline were met. In essence nobody knew what the above meant and the only way forward for SEPIL was to

apply in writing to An Bord Pleanála for clarification, which they did on the 15<sup>th</sup> January 2010.

41. Furthermore with regard to the Request for Further Information on the 2<sup>nd</sup> November 2009, Article 1 of Directive 85/337/EEC is clear in that: “This Directive shall apply to the assessment of the environmental effects of those public and private projects which are likely to have **significant** effects on the environment”. There is no doubt that for certain political and populist agendas this project was significant. However, from a technical and legal perspective it most certainly was not; see for instance the criteria in Annex III of the Directive. Furthermore the conduct of the competent authority in performing its duties **must** restrict itself to the criteria in the ‘hard’ and ‘soft’ law and remove itself from influence by political, media or other influences, after all the process is quasi-legal in nature.
42. This clearly did not happen, why was the oral hearing conducted in May 2009 over nineteen days dominated by the pipeline risk, which clearly was not significant and was already clearly evaluated by SEPIL and Advantica to recognised standards? Why was the Request for Further Information dominated by this insignificant effect of the project, furthermore in a manner which clearly showed the total lack of competency in the subject matter? One also has to seriously question the statement of An Bord Pleanála that “Having examined the detailed proposals submitted and having regard to the fact that Ireland has not adopted a risk-based framework for decision-making on major hazard pipelines (transporting wet gas) and related infrastructure ...” Clearly the principles of risk, which is based on the principle of proportionality, are firmly rooted within EU and Irish Law, as has been highlighted in detail in Sections (E) to (K) in the Appendix. Gas pipelines of the nature of the planning consent are not subject to the Control of Major Accident Hazards (Seveso II) legislation, as there simply is no evidence that they present a significant major accident risk. However, in assessing that level of risk, if it is so required to do so, then clearly the detailed methodologies and knowledge base developed, as outlined in Sections (E) to (K) in the Appendix, are relevant and applicable. After all the as is pointed out in Section (F) in the Appendix with regard to the EU’s ARAMIS project, the Q and A’s on the project website state<sup>13</sup>: “The primary scope of application of the ARAMIS project is

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<sup>13</sup> <http://mahb.jrc.it/index.php?id=418>

limited to the process industries falling under the provisions of the Seveso II Directive. **Extension of the ARAMIS methodology to areas beyond its original scope of application is possible and encouraged**".

43. Instead in Ireland we had the competent authority for the implementation of Directive 85/337/EEC (as amended), refusing to either acknowledge the established 'hard' and 'soft' law applicable to assessing the impact of the project under consideration, refusing to co-ordinate and work with the competent public administrators in this field of industrial risk and Land Use Planning, namely the Health and Safety Authority, and instead adopting their own "appropriate standard against which the proposed development should be assessed". Clearly with regard to the situation of non-compliance with EU Environmental Legislation outlined in Section (A), this is simply another bad example of the current case against Ireland in the European Court of Justice, C-50/09, which relates directly to An Bord Pleanala and the Environmental Protection Agency failing to fulfil the requirements of Articles 2, 3 and 4 of the Directive on Environmental Impact Assessment (85/337/EEC as amended), i.e. failure to assess environmental impacts of a project and failure of the relevant decision makers in different agencies to coordinate effectively.

**(M) An Bord Pleanala's Clarification of 29<sup>th</sup> January 2010**

44. In their reply of the 29<sup>th</sup> January 2010 (Exhibit **PS23** at time of swearing), An Bord Pleanala clarified that "the intent of the Bord is to ensure that persons standing beside the dwellings will not receive a dangerous dose of thermal radiation in the worst case scenario of a "full bore rupture" of the pipeline at maximum pressure". Essentially what this was clearly stating was that the centuries of experience gained with operation of high pressure systems was completely irrelevant, as the were the protective measures that had evolved based on this experience in the engineering design, construction and operation of such a pipeline. An Bord Pleanala were 100% clear in that the pipeline was going to completely split in two anyhow and that was the basis on which planning would be assessed. Furthermore not a single fact or figure was given to justify this stance, i.e. the main reasons and considerations on which this decision was reached (Article 9 of Directive 85/337/EEC as amended). Instead the developer had now to carry the huge additional cost associated with trying to engineer additional measures to reach this new criteria of a "**cordon**

**sanitaire equal to the hazard distance of the worst conceivable case”, i.e. the extent of the imagination of the relevant decision maker(s) in An Bord Pleanala.**

45. Simply put no other Member States or country uses this approach, for obvious reasons, instead as is clearly documented in the Environmental Acquis and in the Sections (E) to (K) in the Appendix, they use the “risk” or “consequence” based approaches to Land Use Planning. These approaches require the relevant facility to use state-of-the-art technology and safety measures in order to protect the population outside the fence from any “worst credible (or conceivable)” accident remaining after these measures have been implemented.
46. Clearly An Bord Pleanala’s stance is that they are completely justified by the lack of a complete and transparent Quantified Risk Analysis. There is however no actual evidence to support this. Certainly small diameter pipelines and thin walled low pressure distribution pipelines, which form a component of overall natural gas distribution system, do suffer major failures, such as when hit by a vehicle or dug up during inappropriate construction activities. However, even the failure rate data for this situation is quite low.
47. Furthermore a large high pressure gas main with a significant wall thickness in a defined and inspected cordon sanitaire is very different. If a small leak were to occur, as oppose to a full bore rupture, the size of the resulting gas cloud and if ignited, resulting explosion, is not related so much to the operating pressure inside the pipeline, but to the size of the hole that occurs. There are years of experience, including in Ireland, of operating a high pressure natural gas distribution system at two thirds the pressure of the Corrib pipeline, indeed the Bord Gais Eireann (BGE) network connecting to the West of Ireland is predominately 750mm diameter and 11 mm wall thickness<sup>14</sup>. This system is of course legally compliant with an acceptable level of residual risk. In Corrib the pipeline under consideration operates at some 50% higher pressure but with a wall thickness of 27 mm and a 500 mm diameter. It is not only an engineering fact, but common sense, that whatever scenario would lead to a leak in the BGE network, would have to be considerably more violent to lead to a similar leak in the Corrib pipeline and the likelihood of the leak occurring is

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<http://www.engineersireland.ie/media/engineersireland/community/whitepapers/Gas%20Pipeline%20to%20the%20West.pdf>

therefore so much lower. In other words it is clearly obvious that the risk in the Corrib Pipeline is significantly lower. However, to collect the frequency of occurrence data to prove that in the form of the Quantified Risk Analysis which an Bord Pleanála wanted, the only manner is to build hundreds of kilometres of similar pipeline (provided one could get the necessary permission) and then wait several years. For what undoubtedly would be the obvious answer, is that if it is constructed and maintained responsibly it simply doesn't fail. It is certainly not the EU's or the legislation's goal, that such a decision making process of complete conservatism should be allowed to prevent the progress of competent technical development. Instead only existing to rubber stamp designs that have been in operation in an identical fashion for several decades. This therefore exposes the whole farce of expecting that a Quantified Risk Assessment will absolve the competent authority from making an informed decision, according to the 'hard' and 'soft' law, with regard to the contentious matter of risk.

48. To clarify this matter in no uncertain terms, the situation above with regard to the full bore rupture of high pressure gas mains is known and was presented to An Bord Pleanála in the documentation submitted and presentations at the oral hearing. For those who wish to investigate further, a guidance document on Quantified Risk Assessment for major accident scenarios was issued by the Province of Sachsen in August 2009 summarising the technical knowledge for this subject<sup>15</sup>. Note: Germany is a Federal State with implementation of the Environmental Acquis occurring at the level of the 16 Provinces; in general specific Provinces take the lead in certain technical areas, such as Sachsen in the field of Quantified Risk Assessment. With regard to rupture of pipelines, this can occur due to maintenance activities, but unsurprisingly is less likely to occur with larger diameter pipelines. Furthermore earth covered pipelines and pipelines outside a potential impact area of falling objects are assumed to have no pipeline rupture. Even if the 5.64 km pipeline, which had been refused permission, had been installed over ground in a possible impact zone, the equation that would have applied for failure frequency leading to a pipeline rupture is:

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<sup>15</sup> <http://www.smul.sachsen.de/lfulg/13916.htm>

$$\lambda = \frac{11 \cdot 10^{-5}}{DN^2} \text{ [1/a*m]}; \quad DN > 15$$

49. Which is equivalent to a failure rate of  $2.5 \times 10^{-7}$ , which is less than one in a million and as such it is not even significant. However, to clarify again, the Corrib pipeline is considerably thicker than standard and is buried underground outside a potential impact area, so any statements relating to a ‘full bore rupture’ are solely based on the imagination and personal opinions of those making them. To clarify once again for the purpose of implementing Directive 85/337/EEC as amended, this pipeline most certainly did not have any significant impact with regard to the criteria in Annex III.
50. It is also necessary in any decision making process to include the costs incurred for any potential improved level of performance, e.g. such as a reduction of impact or potential impact. The Corrib Field had a projected budget of \$1 billion and a six year schedule for implementation; it is now well past its eleventh year with more delays expected due to the refusal to approve the simple 5.64 kilometres of pipeline. When the capital and operating costs are paid, 25% of the resulting revenue goes straight to the Irish exchequer. Recent media reports indicate that the costs so far have risen to €1.92 billion, with the cost of completing the construction, including the totally unnecessary 5 km underground tunnel, rising to a projected €2.5 billion. Therefore the Irish Exchequer alone has lost an input of over €300 million alone from the field from delays and unnecessary requirements, many attributed to An Bord Pleanala. There are also even larger financial losses to be borne by the shareholders of the developers of the asset. Clearly these costs are completely disproportionate for any reduction in impact or potential impact (Principle of Proportionality).

## **(N) Conclusions**

51. As An Bord Pleanala clarified in Exhibit **PS14**, in Section (D), they had no records indicating that they comply with the Environmental Acquis. It is clearly evident from this Affidavit that with regard to key legislation there has been a system of gross maladministration in which An Bord Pleanala acted Ultra Vires. This includes:

- Directive 2003/4/EC. A failure to provide Access to Information on the Environment on Request, including information related to criteria for risk and the system for implementing the Environmental Acquis. A complete failure to fulfil the dissemination requirements (Article 7) of Directive 2003/4/EC in clarifying to those attending the oral hearing / media the legislative basis and policies on which the decision related to the project would be based.
  
- Directive 2003/35/EC. A complete failure to provide the main reports and advice issued to the competent authority on which the decision would be based, such as that on risk and the necessary priorities and conservation measures / management plans for the relevant Natura sites (EU Habitats Directive 92/43/EEC as amended). This documentation is essential to allow the public concerned to ‘prepare and participate effectively in the environmental decision-making’. A complete failure to provide the main reasons and considerations on which the decision is based (Note: Personal opinions with no factual reference and justification in ‘hard’ and ‘soft’ law do not count as reasons and considerations). A complete failure to provide “Access to Justice”, i.e. access to a review procedure before a court of law or other independent and impartial body established by law to challenge the substantive or procedural legality of decisions, acts or omissions subject to the public participation provisions of the Directive. Any such procedure shall be fair, equitable, timely and not prohibitively expensive.
  
- Directive 85/337/EEC (as amended). An Bord Pleanála failed to perform the role as specified for a competent authority. The criteria for decision making, i.e. granting or refusal of development consent, are established in the Environmental Acquis, through the relevant ‘hard’ and ‘soft’ law, by means of procedural analysis and comparison with established benchmarks. The role of the competent authority is therefore as an administrator / adjudicator of the system. In reality in this case, and it is by no means unique for An Bord Pleanála, we had a decision made that was clearly not transparent within the scope of the legislation, instead being based on the personal opinions and agendas of the administrators. In doing so the established benchmarks for risk in Land Use Planning were ignored, there was also a complete failure to co-operate with the other administrative bodies

which were expert in this field. Most disturbing there was an insistence on development consent that required compliance with a “**cordon sanitaire equal to the hazard distance of the worst conceivable case**”, which is in direct conflict with the legislation, in particular the core Principle of Proportionality, and lead to the developer having to carry huge additional costs, in clear breach of the principles in the EU and National guidelines on Land Use Planning. Not only are these costs completely unjustified under the terms of the legislation, but they are clearly not in the ‘Interest of Public Good’. To clarify; not only do they lead to a very significant loss of revenue to the Irish Exchequer, but the precedent established would lead to investment projects simply relocating to other jurisdictions, in which the costs and timeframes reflect the proper implementation of the Environmental Acquis.

52. I am therefore requesting this Honourable Court to overturn the Planning Decision reached by An Bord Pleanala, such that the 5.64 km pipeline as originally proposed by the developer can be awarded the Development Consent, which is due to it, under the correct application of the Environmental Acquis.

53. Furthermore I would also like to point out to this Honourable Court that in over twenty years of active involvement as a Professional Engineer and Environment, Health and Safety Consultant, work that has included over a dozen countries and the training of several administrations in the proper implementation of the Environmental Acquis, I have never seen such crass ignorance in behaviour and disregard for the legislation as with the administrators in An Bord Pleanala. In particular I would like to point out:

- The grandstanding for days on end in disjointed oral hearings about ‘kill zones’, which had no relevance to the legislative requirements for public participation related to the effects of the projects and was insulting to the professionalism of all those involved in the project.
- The refusal to accept, acknowledge or communicate the defined criteria in ‘hard’ and ‘soft’ law, instead turning the exercise into a public debate on how the project should be regulated, rather than defining to the public the criteria for development consent already well established in the legislation.



- The audacity to charge the developer after days on end of this disjointed oral hearing (19 days in early summer 2009 and six weeks in autumn 2010), a large six figure sum for the pleasure of experiencing the totally unsatisfactory and non-compliant manner of implementing Directive 85/337/EEC as amended.
- The manner in which those involved with the project were accused of implementing a development of unacceptable risk to the public (i.e. unsafe), without a single fact or figure or reference to established criteria in ‘hard’ and ‘soft’ law.

54. I’m am therefore strongly advocating that a formal apology be made by all officials in An Bord Pleanala involved with this decision making to those involved with the implementation of the Corrib Development.

55. Furthermore given that Case C-50/09 in the European Court of Justice related to the failures of An Bord Pleanala to comply with the Environmental Acquis, already has significant potential for major fines to be paid by Irish taxpayer, it is clearly obvious that this organisation is in absolutely dire need of reform and is costing the Irish State huge losses with regard to potential infrastructural and industrial development.

## **Appendix**

### **(E) THE LEGISLATIVE PRINCIPLES RELATING TO RISK**

56. The words, risk, hazard, unsafe, danger, are seen by the general public in a negative light and all too frequently are used to great effect by the pressure groups and the media to raise a highly emotive response, even though in one form or another they are essentially present in general life and will always be. However, it is important to realise that there is a legal criteria relating to these words and regardless of the heightened emotions associated with certain projects, the procedures and decisions of the regulatory authority have to follow the principles and parameters established in ‘hard’ and ‘soft’ law.

57. On an International and European perspective it is necessary to strictly define what the above and similar terms refer to in order that the correct benchmarks can be used.

The recently revised (2010) International and European Standard IEC/EN 61508-4 on functional safety of electronic control systems provides a list of Definitions and Abbreviations, which are internationally recognised. For instance:

- a) Hazard: Potential source of harm.
- b) Risk: Combination of the probability of occurrence of harm and the severity of that harm.
- c) Tolerable risk: Risk which is accepted in a given context based on the current values of society.
- d) Residual risk: Risk remaining after protective measures have been taken.
- e) Safety: Freedom from unacceptable risk.

58. It is therefore critical to fully understand and differentiate between the two parameters hazard and risk. The Directive on Control of Major Accident Hazards (96/82/EC as amended) defines them as:

- “Hazard is the intrinsic property of a dangerous substance or physical situation with a potential to create damage”.
- “Risk shall mean the likelihood of a specific effect occurring within a specified period or in a specified circumstances”

59. Hazard can therefore be considered as the potential for something adverse to occur, while risk is a combination of the likelihood and the consequences, but what is safe? There is all too often a public expectation that systems or developments ought to be zero risk and that is the only criteria for acceptance. However, the technical and legislative reality is very different. Firstly in practically all cases once a high level of risk mitigation is implemented the further measures to reduce the level of residual risk rapidly rise in cost and complexity, i.e. the law of diminishing returns.

60. An overriding principle of EU Legislation is the Principle of Proportionality, which requires that the extent of the action must be in keeping with the aim pursued. When applying the general principle of proportionality, the European Court of Justice

frequently states that the principle requires an act or measure to be “suitable” to achieve the aims pursued, or it rather concludes that a decision is disproportionate because it is “manifestly inappropriate in terms of the objective which the competent institution is seeking to pursue”. This principle is now enshrined in the Lisbon Treaty and has always been a core principle on which judgements in the European Court of Justice have been made. It deserves some more scrutiny. Firstly there is the effectiveness or suitability, i.e. the European Court of Justice would consider a measure as disproportionate if it was “manifestly inappropriate in terms of the objective which the competent institution is seeking to pursue”. Secondly there is the necessity or subsidiarity. Subsidiarity can be regarded as a subspecies of necessity. It means that the principle of proportionality is infringed when drastic means were chosen whilst less intrusive instruments were available that would have had similar effect. Finally there is test of proportionality *stricto sensu*<sup>16</sup>. In reality the European Court of Justice pays little attention to the test, but an important reason might be found in the difficulties related to judicial review of balancing exercises carried out by government authorities in the exercise of their discretionary powers.

61. What is an acceptable level of residual risk? Legislation in Ireland, the EU or other countries do not require zero risk solutions, neither should zero risk solutions be sought for in design, construction and operation as they are essentially unachievable. Furthermore it is simply not possible for any legislator / regulator to prescriptively define for each case what is acceptable or unacceptable given the enormous complexity that occurs within individual process plants not to mention within differing industry sectors.
62. It is important to understand the historical basis of EU occupational health and safety legislation, which was given new impetus in 1986 with the adoption of the Single European Act in 1986. This resulted in the area of health and safety at work being dealt with in an operational provision of the EEC Treaty, thereby allowing the Council of Ministers to adopt Directives to protect workers' health and safety at work by qualified majority. These Directives lay down the minimum requirements concerning health and safety at work. The Member States were obliged to raise their level of protection if it was lower than the minimum requirements set by the

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Latin for 'in the strict sense'.

Directives. Failure by Member States to comply with EU legislation on health and safety allows for the Commission to complain of such violations to the European Court of Justice.

63. The European Court of Justice made a judgement of June 2007 in proceedings brought by the Commission against the United Kingdom (Case 127/05) for failing to properly fulfil its obligations under the Framework Directive on Occupational Safety and Health (Directive 89/391/EEC). The UK Health and Safety and Work, etc Act of 1974 introduced a then ground breaking approach to industrial safety in which the obligation for applying safe practices is placed on the designers, manufacturers and operators of a facility by means of a ‘Duty of Care’.

- *“It shall be the duty of every employer to ensure, so far as is reasonably practicable, the health, safety and welfare at work of all his employees”.*

64. The Commissions argument was that this was incompatible with the principles of the EU Framework Safety Directive 89/391/EEC, according to which employers should be liable unless they can approve that the ‘harmful occurrence’ was due to ‘extraneous events with no link to the working conditions controlled by the employers’. Despite the arguments brought forward by the Commission, the ruling of the European Court of Justice accepted the restriction of the duty upon employers of ‘so far as is reasonably practicable’.

65. The key issue then is to demonstrate through the methodology and resulting recommendations that are implemented that, in so far as is reasonably practicable, the health, safety and welfare of those who work in the proposed facility is ensured. The public generally assumes that one is ‘innocent until proven guilty’. This is certainly not the case under the terms of the 1974 UK Act or indeed under EU safety and environmental legislation in general, i.e. the burden of proof rests with the employer. The 1974 Act clearly states that:

- *“It shall be for the accused to prove (as the case may be) that it was not practicable or not reasonably practicable to do more than was in fact done to satisfy the duty or requirement, or that there was no better practicable means than was in fact used to satisfy the duty or requirement”.*

66. Other EU countries which have put a definition on what is reasonably practicable into their legislation, for example the Irish legislation (2005 Safety, Health and Welfare at Work Act) has a readily understandable definition of ‘Reasonably Practicable’ offering further clarification in that:
- *‘Reasonably Practicable’ in relation to the duties of an employer, means that an employer has exercised all due care by putting in place the necessary protective and preventive measures, having identified the hazards and assessed the risks to safety and health likely to result in accidents or injury to health at the place of work concerned and where putting in place any further measures is grossly disproportionate having regard to the unusual, unforeseeable and exceptional nature of any circumstances or occurrence that may result in an accident at work or injury to health at that place of work.*
67. Another example would be the terminology used in German Legislation “Stand der Technik (Sicherheitstechnik)” – which translates to the “state of technology (safety technology)” which requires that the company is required to operate to the current state of technology but not to a zero risk solution.
68. The general public and also the bulk of employees who work in industrial sectors are generally of the opinion that the safety related technical parameters for the design, operation, monitoring and inspection of industrial sites is derived from fixed regulations and controls that are approximately based on the current State of Technology. This is a false assumption. In reality safety regulations are actually a compromise between the various committees and the representatives that form these committees and are strongly influenced by trends in society and the current political situation, i.e. they are often a product of the local cultural situation.
69. To repeat the obvious once again – risk is a highly emotive issue. The public’s expectations are that it can be assessed and benchmarked to a high degree of accuracy. The obvious question is; “how safe is safe enough?” The expectation is that there is a ready answer available to this question – in reality there isn’t. However, there is a systematic manner of addressing the issue through ‘hard’ and ‘soft’ law.
70. From the above it is clear in that the legislation recognises that an element of ‘residual risk’ remains even after applying ‘all necessary measures’ to protect man

and the environment. For instance Article 5 of the Directive on Control of Major Accident Hazards involving Dangerous Substances (96/82/EC as amended – commonly called Seveso II Directive) clearly states that:

- Member States shall ensure that the operator is obliged to take **all necessary measures to prevent major accidents and to limit their consequences for man and the environment.**
- Member States shall ensure that the operator is required to prove to the competent authority that he has taken **all measures necessary as specified in this Directive.**

71. The EU has issued Guidance on preparing Safety Reports, which is available from the EU Major Accidents Hazard Bureau. Safety Reports are required for operators of establishments that fall under the ‘top tier’ (high risk) requirements of the Directive on Control of Major Accident Hazards involving Dangerous Substances. As the EU Guidance on Safety Reports states; “although ‘**necessary measures**’ are taken there will be some element of residual risk. The decision as to whether a residual risk is acceptable depends on national approaches and practices. Nevertheless there are some widely accepted supporting principles for this decision:

- The efficiency and effectiveness of the measures should be proportionate to the risk reduction target (i.e. higher risk require higher risk reduction and, in turn, more stringent measures).
- The current state of technical knowledge should be followed. Validated innovative technology might also be used. Relevant national safety requirements must be respected.
- There should be a clear link between the adopted measures and the accident scenarios for which they are designed.
- Inherent safety should be considered first, when feasible (i.e. hazards should always be removed or reduced at source).

72. As highlighted already, risk is a **probability of occurrence** of harm and the **severity** of that harm. The established methodology is therefore based on identification of the possible hazards. These are then subject to a risk assessment in which the

components relating to likelihood and consequences are assessed using a combination of qualitative and quantitative approaches. For risks which are deemed to be significant it is necessary to identify the necessary measures to prevent, control and limit the risks, this is the risk mitigation step. If the risk is deemed to be acceptable then no further measures need to be taken. Alternatively if the risk is deemed as unacceptable then further control measures need to be identified and assessed. A hazard is therefore only a 'stepping stone' for determination of risk and the legislation is clear in that a level of residual risk remains after all measures necessary have been applied.

73. Furthermore the EU Commission's Non-binding Guide to Good Practice for Implementing of Directive 1999/92/EC (Explosive Atmospheres)<sup>17</sup> is clear in that: "Assessment of explosion risks initially focuses on:

- The likelihood that an explosive atmosphere will occur; and subsequently on:
- The likelihood that sources of ignition will be present and become effective.

Consideration of effects is of secondary importance in the assessment process, since explosions can always be expected to do a great deal of harm, ranging from major material damage to injury and death. Quantitative approaches to risk in explosion protection are secondary to the avoidance of hazardous atmospheres".

## **(F) THE QUANTIFICATION OF RISK**

74. So how does one quantify and benchmark risk? Clearly as risk is the combination of the **probability of occurrence** of harm and the **severity** of that harm, one should calculate the two individual components, i.e. probability of occurrence and severity and then the combination. However, as will be discussed latter, where does one get accurate data on the probability of occurrence (likelihood) and how does one assess something as complex as severity? Severity can obviously be linked to a quantifiable metric, such as the number of fatalities, but there are other factors to be considered, such as injuries, material damage, environmental damage, etc. One cannot simply multiply such complex assessments of probability and severity together.

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<sup>17</sup> <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2003:0515:FIN:EN:PDF> Section 2; (Page 13 of 71)

75. The US Nuclear Regulatory Commission (NRC) in its webpage on Risk Assessment in Regulation<sup>18</sup> explains: The NRC's concept of risk combines the probability of an accident with the consequences of that accident. In other words, the NRC examines the following questions:

- What can go wrong?
- How likely is it?
- What would be the consequences?

76. The NRC then uses risk information to reduce the probability of an accident and to mitigate its consequences. The following three activities illustrate this concept of risk: climbing Mt. Everest, skydiving, and riding a unicycle.

- **High Probability, High Consequence.** An expedition to Mount Everest has a high probability of serious consequences, such as a fatal fall or frozen extremities. As a result, the overall risk is considered to be very high.
- **Low Probability, High Consequence.** A skydiving accident, in which the parachute fails to open, can also have severe consequences (including fatality). However, the risk is acceptable to many people because using the proper safety precautions can adequately reduce the probability of an accident. As a result, the overall risk is considered to be moderate.
- **High Probability, Low Consequence.** A unicyclist has a relatively high probability of falling. However, the consequences of such an accident are relatively minor. The unicyclist usually lands on his or her feet or, at worst, takes a tumble. Thus, even though the probability of falling is high, the consequences are so minor that the overall risk is low.

77. To assess risk from the two components, probability of occurrence and severity, the general approach is to use a Risk Matrix. In 1998 the EU Major Accident Hazards Bureau developed a reference industrial facility that fell under the Top Tier (High Risk) provisions of the Control of Major Accident Hazards (Seveso II) legislation and assigned a number of experienced institutions throughout the EU to complete a

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<sup>18</sup> <http://www.nrc.gov/about-nrc/regulatory/risk-informed.html>



risk assessment exercise. This project was called ASSESSment of Uncertainty Risk Analysis of Chemical Establishments (ASSURANCE)<sup>19</sup>. The result was a wide variation in results, for instance the seven partners produced results for the distance to lethal effects that ranged from -62% to +156% of the average value.

78. This led to the ARAMIS (Accidental Risk Assessment Methodology for Industries in the framework of the Seveso II directive) project under the EU Major Accident Hazards Bureau. The objective of ARAMIS was to develop a European harmonised risk assessment methodology to evaluate the risk level of industrial establishments by taking into account the prevention tools implemented by the operators. As the Q and A's on the project website state<sup>20</sup>: "The primary scope of application of the ARAMIS project is limited to the process industries falling under the provisions of the Seveso II Directive. **Extension of the ARAMIS methodology to areas beyond its original scope of application is possible and encouraged**".

79. For the selection of Reference Accident Scenarios for modelling in the calculation of the severity, the ARAMIS Final User Guide presents a Risk Matrix (see Fig. 1 at end of this Affidavit). The X-axis corresponds to the four consequence classes and the Y-axis corresponds to the frequency of the dangerous phenomena. However, there are plenty other versions of this Risk Matrix in use for different applications and circumstances. For instance in September 2010 the German Authorities produced a guidance document on risk analyses in the field of population protection<sup>21</sup>. This utilises a five by five matrix (see Fig.2 at end of Affidavit) in which the probability ranging from very improbable to very probable is on the X-axis and the Y-axis corresponds to the extent of damage, ranging from insignificant to catastrophic. The risk is then subdivided into four groups, comprising very high, high, medium and low. This is based on the International and European Standard ISO/IEC 31010:2009 and EN 13010:2010. However, the calibration of the matrix in terms of numerical quantification of damage (severity) is left to the individual authorities responsible for detailed emergency planning.

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<sup>19</sup> <http://mahbsrv.jrc.it/antwerp/docs%5CLauridsen.pdf>

<sup>20</sup> <http://mahb.jrc.it/index.php?id=418>

<sup>21</sup> [http://www.bbk.bund.de/nr\\_402322/DE/03\\_Aktuelles/01\\_Meldungen/Nachrichten/2010/04051030\\_Methoden-Risikoanalyse-im-BeVSch.html](http://www.bbk.bund.de/nr_402322/DE/03_Aktuelles/01_Meldungen/Nachrichten/2010/04051030_Methoden-Risikoanalyse-im-BeVSch.html)

80. If we take Switzerland, they also use a Risk Matrix for this purpose<sup>22</sup>, but it is a six by seven matrix that is used in their Cantonal risk assessment methodology for emergency planning (KATAPLAN). ). In it risk is assessed in terms of three categories; significant risks, large risks and extreme risks. Note: The criteria for defining the scales are defined in the KATAPLAN guide. In Ireland the Health and Safety Authority's guidance on Safety Report Assessment<sup>23</sup> states: "Where a matrix is used to select major accidents, it should be referenced to an appropriate source to demonstrate its fitness-for-purpose (or a clear justification presented)". Essentially the guidance recognises that there is no clear cut manner for completing this task.
81. The other issue is the availability of the data related to frequency of occurrence. If a facility or system is designed, constructed and operated to a high standard then the frequency of failure should be low. In essence it is always going to be difficult to find accurate data. In October 2005 the German Authorities held a Workshop in Bonn on the use of probabilistic methods in the European permitting process, their usability in German major accident law, in particular with a view point of the environmental associations<sup>24</sup>. As the presentation from the EU's Major Accident Hazard Bureau demonstrated, there was unsatisfactory knowledge related to the occurrence of failure and numerical parameters for reliability of components. The use or evaluation of the data always required a "deterministic element (expert judgement)". For instance the failure probabilities used in the ASSURANCE project for a break in a 100 mm diameter pipe ranged from a minimum of  $7.3 \times 10^{-8}$  to  $1.4 \times 10^{-6}$  per meter per year, a factor of almost twenty fold. With regard to national values, the UK Health and Safety Executive (FRED) quote a failure rate of  $2 \times 10^{-7}$  for a complete break of pipes with a diameter greater than 150 mm, while the Netherlands (Purple Book) quotes a value of  $1 \times 10^{-7}$ , a reduction of 50%.
82. Another example is that the Irish Health and Safety Authority's Land Use Planning Guidelines<sup>25</sup> require that sudden catastrophic failure of an atmospheric storage tank be considered (with a likelihood of  $1 \times 10^{-5}$  per year per tank) as well as a bundled release (with a likelihood of  $1 \times 10^{-4}$  per year per tank). It should be noted that these

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<sup>22</sup>[http://www.bevoelkerungsschutz.admin.ch/internet/bs/en/home/themen/gefaehrdungen-risiken/kant\\_gefaehrdungsanalyse/leitfaden\\_risikoanalyse.html](http://www.bevoelkerungsschutz.admin.ch/internet/bs/en/home/themen/gefaehrdungen-risiken/kant_gefaehrdungsanalyse/leitfaden_risikoanalyse.html)

<sup>23</sup>

<sup>24</sup>[http://www.kas-bmu.de/publikationen/andere/ws\\_risiko.pdf](http://www.kas-bmu.de/publikationen/andere/ws_risiko.pdf)

<sup>25</sup>[http://www.hsa.ie/eng/Your\\_Industry/Chemicals/Control\\_of\\_Major\\_Accident\\_Hazards/Approach\\_to\\_LUP\\_under\\_Comah\\_Regs.pdf](http://www.hsa.ie/eng/Your_Industry/Chemicals/Control_of_Major_Accident_Hazards/Approach_to_LUP_under_Comah_Regs.pdf)

failure frequencies are generic and do not make any allowance for preventative or mitigation measures.

83. The German Major Accident Commission's Technical Committee for Plant Safety's Recommendations for effect distances from Seveso establishments - SFK/TAA-GS-1<sup>26</sup> in comparison, discounts catastrophic failure so long as standards are followed, and their basis is that "leak comes before failure". They therefore reason that, for Seveso sites, "because of the high standard of design, fabrication and inspection, a spontaneous failure of a vessel or the complete rupture of large bore pipes can be ruled out within the context of the present recommendations, since these events are sufficiently improbable". This position has been developed from analysis of data collected by the Statistisches Bundesamt (Federal Statistics Agency), which in Germany publishes a report each year on Accidents with water hazardous materials (Series 19 Row 2.3 / Fachserie 19 Reihe 2.3). This tabulates the amount of material released in each water hazard class (WGK); the location; the conditions for failure, such as corrosion or failure of protective systems; the activity, such as in storage or transportation; the amount which was recovered; the spill clean up conditions; the industry sectors, such as mineral oil, slurry or silage liquor, etc.
84. As the ASSURANCE project found, significant variation occurs in both the assessment of frequencies and in the assessment of consequences. The different results obviously affect the relevant risk-informed decisions, mainly Land Use Planning, emergency planning and acceptability of risk. While further work is progressing in this area, such as the EU ARAMIS project, and the level of knowledge is being improved, a high degree of assumptions and judgemental assessment will always be inherent in the process.

#### **(G) THE LEGISLATIVE BASIS FOR ASSESSING RISK FROM MAJOR ACCIDENT HAZARDS**

85. Risk assessment is a key principle behind EU and National legislation, such as the requirements of the Framework Directive on Safety (89/391/EEC), which was implemented in Ireland through the Safety, Health and Welfare at Work Act of 1989 (e.g. Section 12). The Seveso II Directive (96/82/EC as amended) requires in Article

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<sup>26</sup> Shortened English Translation available at: [http://www.kas-bmu.de/publikationen/sfk\\_gb/sfk-taa-gs-1k-en.pdf](http://www.kas-bmu.de/publikationen/sfk_gb/sfk-taa-gs-1k-en.pdf)

7 that the operator draw up a document setting out his major-accident prevention policy, designed to guarantee a high level of protection for man and the environment by appropriate means, structures and management systems. The document must take account of the principles contained in Annex III of the Directive. Annex III in turn is clear in that the requirements laid down in the document should be proportionate to the major-accident hazards presented by the establishment.

86. As part of the operator's safety management system, Annex III (c) (ii) requires:

- **“Identification and evaluation of major hazards** – adoption and implementation of procedures for systematically identifying major hazards, arising from normal and abnormal operation and the **assessment of the likelihood and severity”**.

87. For operators, who fall under the provisions of the Top Tier (high hazard) requirements of the Seveso II Directive, the documentation requirements are more extensive, in which a Safety Report to the requirements of Article 9 have to be completed. Annex II specified the minimum data and information to be considered in this Safety Report and Annex II (IV) (A) and (B) requires:

- **“Detailed description of the possible major-accident scenarios and their probability or the conditions under which they occur** including a summary of the events which may play a role in triggering each of these scenarios, the causes being the internal or external to the installation”.
- **“Assessment of the extent and severity of the consequences** of identified major accidents including maps, images or, as appropriate, equivalent descriptions, arising from the establishment, subject to the provisions of Articles 13 (4) and 20” (*confidentiality*).

88. While the Seveso legislation above requires an **assessment of likelihood and severity** of major accident hazards, it most certainly does not require a Quantified Risk Assessment.

## **(H) ‘HARD’ and ‘SOFT’ LAW FOR LAND USE PLANNING**

89. Article 12 of the Seveso II Directive is clear in that Member States shall ensure that the objectives of preventing major accidents and limiting the consequences of such accidents are taken into account in their land-use policies and / or other relevant policies. Furthermore Member States shall ensure that their land-use and / or other relevant policies and the procedures for implementing those policies take into account the need, in the long term, to maintain appropriate distances between establishments covered by this 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 or interest and in the case of existing establishments, of the need for additional technical measures in accordance with Article 5 (*general obligations of the operator*) so as not to increase the risks to people.
90. The EU Commission, through its Major Accident Hazards Bureau (MAHB) has drawn up Land Use Planning Guidelines in the Context of Article 12<sup>27</sup> (Exhibit **PS21** at time of swearing). Note: These EU Guidelines were adopted by the Health and Safety Authority (HSA) in their Policy and Approach to COMAH Risk-Based Land Use Planning in September 2009 (Exhibit **PS22** at time of swearing). As the Introduction of the EU Guidelines states: “The Document is intended to give guidance for risk assessment in Land Use Planning in general as far as the major accident potential of industrial establishments is concerned”. With regard to Section 4 of these guidelines, general principles with respect to Best Practice of Land Use Planning and Risk Assessment are defined to comply with the legal requirement. These include that:
- Hazard / Risk Assessment methods should exist, which can be based on hazard and / or risk; generic adoptions may be used. A systematic approach to Land Use Planning advice will be used, where systematic means in general that the limiting conditions of an analysis, a survey, etc, are identical and pre-defined for all steps or all parts of the process.
  - Inputs should include a representative set of major accident scenarios. **A credible and / or evaluated range of scenarios** should be defined to provide information on the potential extent of consequences. Distances or zones are determined within which Land Use Planning controls should apply.

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<sup>27</sup> <http://mahbsrv.jrc.it/downloads-pdf/LUP%20Guidance-2006.pdf>

- Risks to public should not increase significantly and over time be maintained or reduced where necessary. Member States need to develop approaches to define what is “significant” (baseline). Risk communication may be necessary.
- The residual risks arising from a Major Hazard establishment to individuals and to society should not exceed a maximum desirable level. Residual risk is the risk that remains after having relevant safety measures in place. Member States need to establish approaches to define desirable levels. There must be Land Use Planning related policies that mitigate risk. These Land Use Planning policies should be such that they can be implemented and able to reduce the off-site risk at all times.

91. The EU guidelines are clear in that Land Use Planning policies must consider various economic factors, like; regional disparities, excessive costs for infrastructure, waste of resources, need for growth or need of economy for long term sound and predictable conditions.

92. In Section 7 of the guidelines on “Technical advice related to major accident potential: Hazard and Risk Assessment Methodologies and Criteria”, it is made clear that **risk assessment in Land Use Planning takes place under the influence of uncertainty**. Indeed the definition of Risk Assessment used in the guidelines is; “the overall process comprising a risk analysis (the systematic use of available information to identify hazards and to estimate risk) and risk evaluation (procedure whether the desirable level of risk has been achieved).

93. It is clarified **that in principle “risk” is a term of universal significant implying elements of uncertainty and consequences**; a “risk” is created by a “hazard” – a disposition (properties, potential) to cause adverse effects. “Desirable” stands for a broad qualitative target definition. It does not indicate a safe / unsafe boundary value. “Desirable” or “tolerable” refer to the level of risk which is accepted in a given context based on the current values of society. In the industrial safety management context and based on other considerations (social, economic, etc) a risk higher than this desirable level may not necessarily cause binding measures against the continuation of the relevant activity immediately or in the future (contrary to the usual strict linguistic meaning of the term “intolerable”).

94. Section 7.2 of the guidelines provides an overview of existing methodologies.

Existing Risk Assessment methods for Land Use Planning may be considered as a specific subdivision of those Risk Assessment methods used for risk analysis in the context of the safety of industrial establishments. Risk Assessment methods may consist of the following four elements, in various combinations:

Qualitative	Quantitative	Deterministic	Probabilistic
Non-Numerical Assessment	Numerical Assessment	Safety defined as a discrete value	Safety defined as a distribution function

95. Regarding the way the likelihood of the accident scenario is taken into account, two main categories of approaches can be distinguished; the first focuses on the assessment of consequences of a number of conceivable event scenarios and can be typically called “consequence based” approach, and the second on the assessment of both consequences and probabilities of occurrence of the possible event scenarios and can be called “risk based “ approach. For a given installation, a “consequence based” approach will characteristically show the consequence area for lethal effects and serious injuries resulting from scenarios assessed, while a “risk based” approach will show an area within which there is a given probability of a specified level of harm resulting from the large number of possible accident scenarios.

96. The “Consequence based” approach is based on the assessment of consequences of credible (or conceivable) accidents, without explicitly quantifying the likelihood of these accidents. This way the approach circumvents having to quantify the frequencies of occurrence of the potential accidents and the related uncertainties. A basic concept is the existence of one or more “**worst credible scenario(s)**”, which are defined using expert judgement, historical data and qualitative information obtained from hazard identification. The underlying philosophy is based on the idea that if measures exist sufficient to protect the population from the worst accident, sufficient protection will also be given for any less serious incident. Therefore, this method evaluates only the extent of the accidents’ consequences, and not their likelihood, which is taken into account only implicitly: **Extremely unlikely**

**scenarios may not be considered as “credible” or “conceivable” and may be excluded from further analysis.**

97. The second main category is the “risk based” approach (*also known as the “probabilistic” approach*). The purpose is to evaluate the severity of the potential accidents, and to estimate the likelihood of their occurring. For estimating the likelihood of scenarios various methods are in use, ranging from simple selection of scenarios and frequencies from the relevant databases to the application of sophisticated tools. In general, the “risk based” approaches define the risk as a combination of the consequences derived from a range of possible accidents, and the likelihood of these accidents. The degree of quantification may vary. Typically a risk-based approach consists of five phases:

- Identification of Hazards (usually a deterministic step **including the selection of realistic scenarios**);
- Estimation of the probability of occurrence of the potential accidents;
- Estimation of the extent of consequences of the accidents and their probability;
- Integration into overall risk indices that may include both individual and societal risk;
- Comparison of the calculated risk with acceptance criteria.

#### **(I) THE KEY ISSUE – DEVELOPMENT OF REALISTIC SCENARIOS IN THE RISK ASSESSMENT PROCESS**

98. The EU Land Use Planning Guidelines are clear that scenarios describe the conditions that might lead to a major accident and the potential consequences. Scenarios must be well defined and all relevant scenarios need to be addressed. Section 9 of the EU Guidelines is therefore dedicated to this issue. Five selection principles are therefore provided.

- Selection Principle 1: Reference scenarios to be used for risk assessment in Land Use Planning may be selected by the frequency of their occurrence and the severity of their consequences.



- Selection Principle 2: “Worst case” scenarios are not necessarily the basis for Land Use Planning, but may rather be considered for a matter of emergency planning, further to the requirement to implement Best Practice or Standards to reduce Worst Case events to a “negligible” frequency.
- Selection Principle 3: The time scale of the consequences of a specific scenario to come into effect shall be considered for the selection.
- Selection Principle 4: According to the chosen level of likelihood for the occurrence of a reference scenario the effectiveness of barriers may be taken into account for the selection.
- Selection Principle 5: Land-use planning is both a prevention and mitigation measure offsite, which requires as a minimum that relevant good practice as published in the standards has been implemented onsite.

99. Note: The final Selection Principle is clarified in the document in that: As a common principle it should be assumed that a certain standard of technology is in place.

100. If we consider the EU ARAMIS methodology referred to previously in Section (F), the Q&A section on the website<sup>28</sup> is clear in that: “Based on criteria such as likelihood, the presence of safety barriers, the efficiency of the safety management system and the potential consequences of accidents, the number of accident scenarios identified with Methodology for Identification of Major Accident Hazards can be narrowed down to a set of reference accident scenarios by disregarding those scenarios that have no actual effect on the consequence severity and against which the installation is adequately protected. This eliminates some conservatism without compromising the safety level of an installation. Land-use- and emergency-planning decisions are then based on a realistic, best-estimate analysis and cost-effectiveness is improved”.

101. The UK Health and Safety Executive is clear in their Current Approach to Land-use Planning<sup>29</sup> that: “all foreseeable scenarios and a representative set of events which describe a set of circumstances which, for that installation, could lead to an accidental release of hazardous substances”.

<sup>28</sup> <http://mahb.jrc.it/index.php?id=418>

<sup>29</sup> <http://www.hse.gov.uk/landuseplanning/lupcurrent.pdf>

102. The approach in German through their Control of Major Accident Hazards (StörfallV) legislation is clear in that it involves “Dennoch-Störfälle”, which can be translated as ‘major accidents despite precautions’, which are the scenarios which remain after accident preventative measures have been implemented but on the basis of taking effect of a reasonably excluded hazard source or the coincidental taking effect of more independent from one another sources of hazard cause a serious danger.

103. The Danish Emergency Management Agency (DEMA) has developed a model for Risk and Vulnerability Analysis (RVA)<sup>30</sup>. The is based on the outlining of realistic scenarios where critical functions are significantly affected (“breaking point”), and which therefore require extraordinary countermeasures. Both “worst-case” scenarios and frequently occurring events should thus be excluded from the analysis.

#### **(J) The Recognised Acceptance Criteria for Risk**

104. We also have to consider the general perception in the public, driving the car for work or leisure is an everyday occurrence. It is most certainly not low risk, but it is a risk that the public accepts as they are accustomed to driving and enjoy its benefits. However, a technological risk, which is far, far lower in numerical terms, is one that can often result in outrage as it is not understood.

105. In 2002 there were 10.4 accident deaths per population of 100,000 in the Republic of Ireland. In other words one had a 1 in 10,000 chance of a road accident fatality or a risk of  $10^{-4}$ . This is a reasonably typical value for road accident deaths, although the inherent probability with this type of analysis can be demonstrated by the fact that in the period 2005 to 2010 road accidents in Ireland reduced by 40%. This only demonstrates once again that historical figures are of limited accuracy when improvements in infrastructure, technology and safety culture are applied.

106. This level of risk is not considered acceptable in industrial risk management. In general a risk level of one in a million ( $10^{-6}$ ) is considered trivial or insignificant. A risk figure between  $10^{-4}$  and  $10^{-6}$  is considered to be in the ALARP (As Low as

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<sup>30</sup> [http://www.brs.dk/fagomraade/tilsyn/csb/Eng/RVA/the\\_RVA\\_model.htm#](http://www.brs.dk/fagomraade/tilsyn/csb/Eng/RVA/the_RVA_model.htm#)

Reasonably Practical)<sup>31</sup> range. In other words if practical measures can be implemented to reduce this level of risk then this is what is should be completed.

## **(K) The Limitations of Quantified Risk Assessment (QRA)**

107. As was discussed previously in Section (G) above, the Seveso legislation on Control of Major Accident Hazards requires an **assessment of likelihood and severity** of major accident hazards, it most certainly does not require a Quantified Risk Assessment. Neither does the ‘soft law’, i.e. the codes and guidance produced as an aid in implementation of the legislation, require that a Quantified Risk Assessment be completed. In the Workshop held in Bonn in October 2005 by the German Authorities on the use of probabilistic methods in the European permitting process, referred to earlier in Section (F), it was pointed out:

- By the European Commission presentation that despite the unsatisfactory extent of knowledge on the failure rates of components and their reliability, a number of EU Member States (B, GB, HUN, HL, SLK, SLW, SP) use the currently available values.
- By the Federal Ministry for the Environment (BMU), how prior to the transposition of the Seveso II Directive (pre-2000), the approach in Germany was traditionally based on deterministic (“consequence based”) processes for estimating and describing the probability of accidents. Outside Germany probabilistic (“risk based”) processes were established in major industry countries and were finding increasing use. In general risk based approaches were to be found, for example being employed in various areas of use in the following countries: USA, United Kingdom, Switzerland, Sweden and the Netherlands.
- The German Federal Environment Agency (UBA) concluded that Quantified Risk Assessment within the scope of its limitations is “Stand der Technik” (*State of Technology*). However, what was decisive was the specific data quality. Furthermore the results of a Quantified Risk Assessment are difficult to compare

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<sup>31</sup> <http://www.hse.gov.uk/risk/theory/alarp.htm>

with absolute limit values. Quantified Risk Assessment does not serve the necessary measures of transparency. Generic approaches hinder the evaluation in the individual case and automatic processes contribute to a loss in competency. The questions were posed: Are there existing defects in the praxis that has existed to date? Is the new approach necessary? The data in Fig 3 (at the end of the affidavit) on the number of Major Accidents per year taken from the EU's Major Accident Reporting System (MARS) database of 560 reported accidents under the Seveso legislation was then presented.

108. One of the main problems presented with the public's perception of risk is the high importance attributed to the risk of low probability, high consequence events. "Risk aversion" is the phenomenon whereby the importance attributed to high consequence events increases, for several reasons, disproportionately to their expected value. In Switzerland risk weighted safety planning takes this into consideration through the use of an "aversion factor" and a guidance document has been produced by the authorities there in this subject<sup>32</sup>. However, the document is clear in that:

- The development of normative decision-making models which, for example, highlight and illustrate the value judgements involved in decisions that society is ill-prepared to answer because it has yet to address them sufficiently either in terms of their institutional implications or in terms of their very content. Experts and specialists agencies alone are in no position to provide a quasi-objective formulation of socially acceptable rules regarding this issue. "How safe is safe enough?" is a broad normative question, which can only be answered by means of an interdisciplinary approach that is firmly rooted in society itself.
- The fundamental problem is that although individuals and society are constantly faced with decisions of varying seriousness, the comprehensive examination of decision-making processes and the formal modelling of decision making have been slow to develop. This is particularly true of

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<sup>32</sup> Summary of research available in English at: <http://www.bevoelkerungsschutz.admin.ch/internet/bs/en/home/themen/gefaehrdungen-risiken/studien/risikoaversion.parsys.0002.downloadList.17023.DownloadFile.tmp/risikoaversionzusammenfassenderbereich20081031e.pdf>

decisions that involve a high degree of uncertainty, like those which must be taken during the safety planning process. The theory of decision making under uncertainty shows that this is an inherently subjective problem. Consequently, there can be no generally valid and objective rules, and no amount of detailed analysis will lead to value-free decisions.

109. The Joint Research Centre of the EU Commission stated in their 2008 “Overview of Roadmaps for Land-Use Planning in Selected Member States”<sup>33</sup>: “Risk management implies a choice among alternatives in the presence of uncertainties. Indeed the results of predictive models and expert judgements are uncertain, especially when they refer to phenomena verifiable only in the long term (e.g. nuclear waste disposal, global climate change and its effects, etc.). The different values, knowledge and interests of the parties involved with respect to expected costs and benefits, parameters to be considered and equity of proposed deliberations represent the second difficult issue. [...] recent changes in the paradigms for risk analysis and management show examples of participatory procedures developed for facilitating adoption and implementation of informed decisions, which appear to be promising for achieving consensus at least as far as local and/or national decision making is concerned. [These processes] aimed at the “characterization” of risks through the involvement of different parties and interests in the early stage of the problem-solving, before any formalization of the risk itself. This is not aimed at a reduction of the role of the scientific modelling, but at the elicitation of the values and the perspectives of the involved communities in order to integrate them as part of the analysis and in order to build a mutual trust among the different parties”.

**(O) Figures referred to in the Affidavit**

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<sup>33</sup> <http://mahbsrv.jrc.it/downloads-pdf/Roadmaps-2008.pdf>

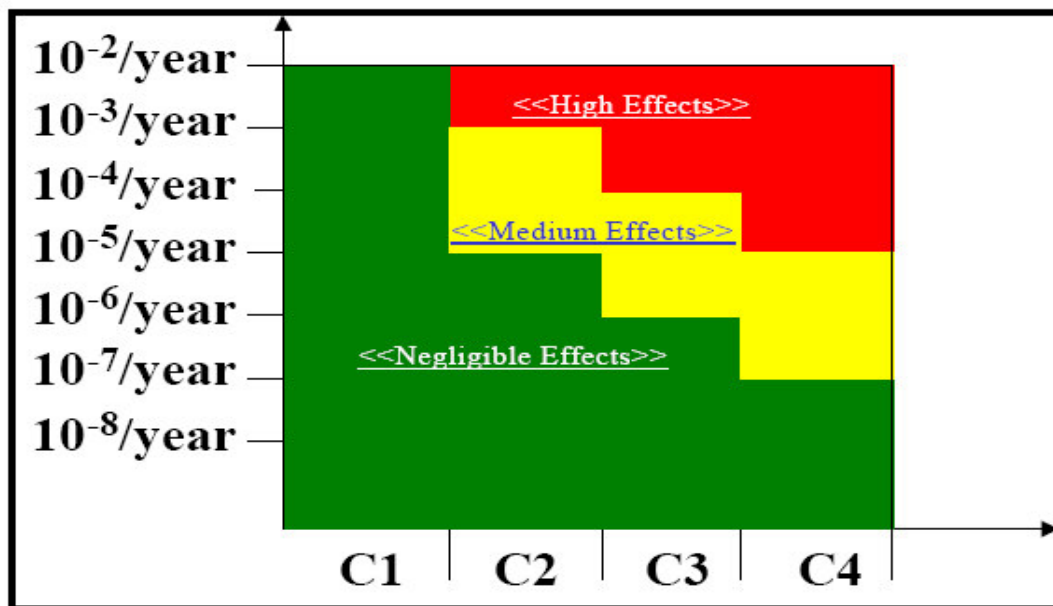


Fig.1: Risk Matrix taken from ARAMIS Final User Guide<sup>34</sup>

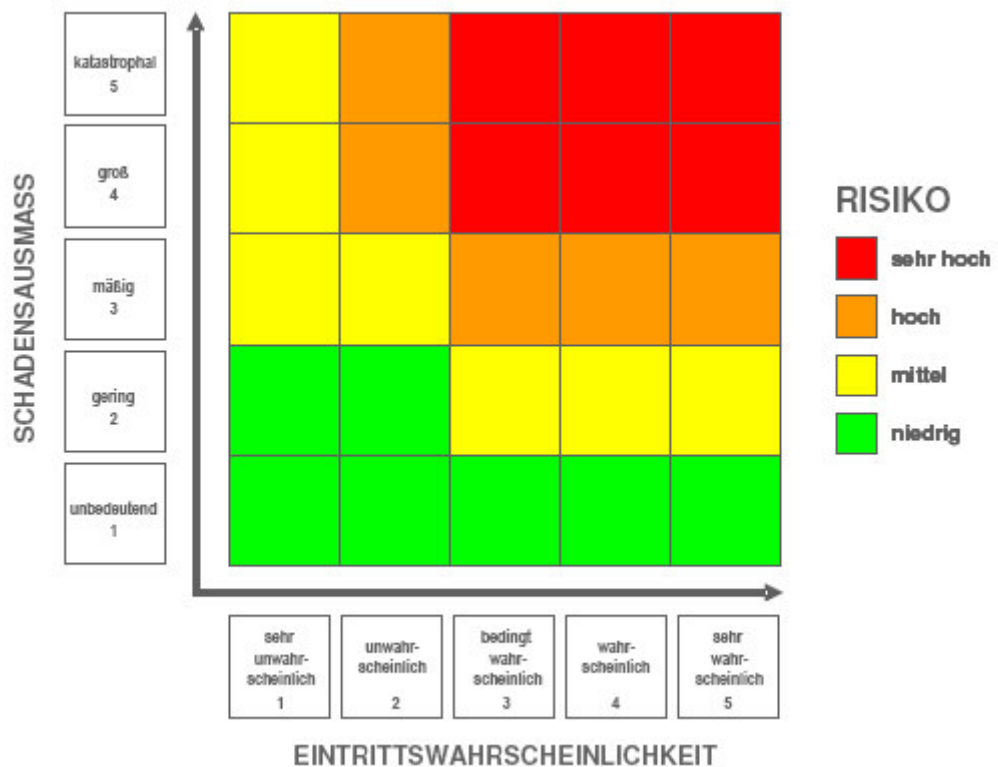
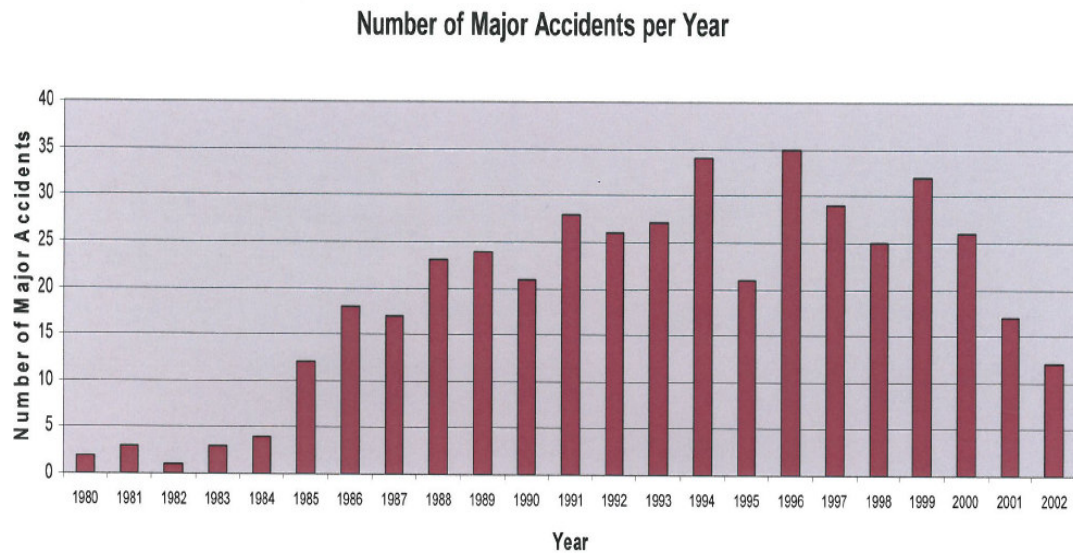


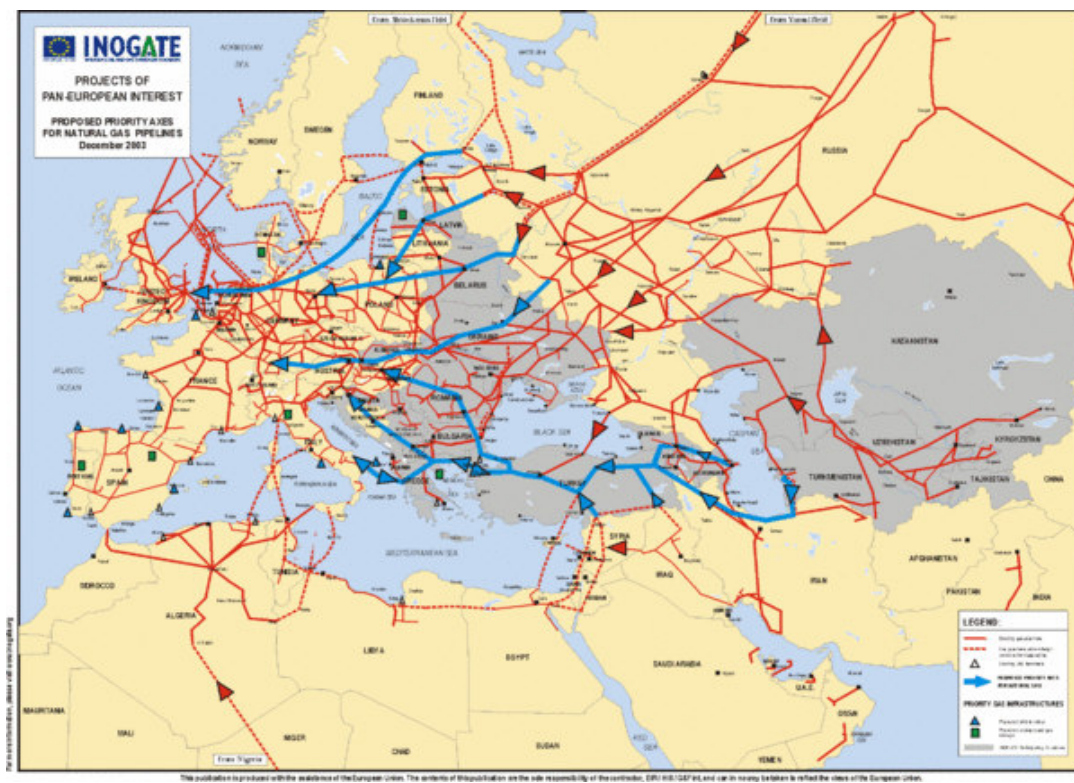
Fig 2: Risk Matrix from German guidance on risk analyses for population protection

<sup>34</sup> [http://mahb.jrc.it/fileadmin/ARAMIS/downloads/ARAMIS\\_FINAL\\_USER\\_GUIDE.pdf](http://mahb.jrc.it/fileadmin/ARAMIS/downloads/ARAMIS_FINAL_USER_GUIDE.pdf)





**Fig. 3: Source MARS Database - <http://mahbsrv.jrc.it/mars/default.html>**



**Fig 4: Hundreds of thousands of kilometres of high pressure natural gas pipelines criss-cross Europe. Indeed the one in blue under construction in the Baltic will operate at one and a half times the pressure in the Corrib pipeline.**

Save as aforesaid, I depose to the foregoing from facts within my own knowledge.

SWORN AT

In the County of

this     day of                      2010

before me a Solicitor of the