

PEER REVIEW MEETINGS ON THE ASSESSMENT OF RISKS IN THE
OFFSHORE OIL AND GAS INDUSTRY

28 MARCH 2012 & 2 MAY 2012

SUMMARY REPORT

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1 Introduction

In October 2011, the Commission adopted a proposal for a Regulation on offshore safety. This proposal was accompanied by an Impact Assessment regarding policy alternatives, their effects on risk reduction of a major offshore incident and the costs associated with the implementation of the alternatives. The Impact Assessment also includes a study performed by the Commission, on the frequency and costs of oil blowouts (and other major accidents) in the offshore oil and gas industry.

After publication of the proposed Regulation and the Impact Assessment, the industry associations Oil & Gas UK (OGUK) and OLF commissioned similar studies on the frequency and costs of oil blowouts. These studies were performed by GL Noble Denton (GLND) and DNV respectively. Both studies arrived at different conclusions from the Commission's study, regarding the annualised costs for blowouts and other major accidents and the reduction of these costs as a result of the measure proposed in the Regulation.

These differences were also highlighted during a stakeholder meeting organised by the Commission on 31 January 2012, with the industry, trade unions and NGO's. At this meeting, the Commission proposed to arrange a technical peer review with the authors of the respective studies (GLND and DNV) together with their sponsor groups (OGUK and OLF).

2 Peer review meetings

The Commission arranged a peer review meeting on 28 March 2012, 13.00 – 17.30 hrs, at the Borchette Conference Centre in Brussels. The purpose of this peer review was to objectively identify where the studies agree and where and how the studies differ. A Terms of Reference including an agenda for the meeting was drafted by the Commission and sent to the attendees (see Annex I). Unfortunately, shortly before the 28 March meeting, it appeared that the representatives from DNV could not attend this meeting. With only one representative from OLF present at the 28 March meeting, it was decided to hold a separate meeting with representatives from DNV and OLF as sponsor at a later date. The Commission arranged the second peer review meeting in Brussels on 2 May 2012, 11:00 – 15:30 hrs.

The meetings were chaired by an (independent) representative of the UK Health and Safety Laboratory, Dr Bill Nixon. The Chair subsequently liaised with the meeting secretary to prepare this summary report.

3 Outline of the meetings

Each of the meetings was conducted in a similar manner. For the record, an outline of the proceedings for both is presented here. The main findings from the discussions are set out in sections 4 and 5.

3.1 First peer review meeting, 28 March 2012

An introductory statement was made by Jan Panek, Head of Unit B3 of DG Energy of the Commission. He briefly explained the background and purpose of the meeting and introduced Bill Nixon, as Chairman of the meeting. The Chairman opened the meeting, remarking that when he reviewed each of the studies performed, he considered that the approach taken in all the studies was quite similar:

1. Estimating the annualised costs of a major accident;
2. Estimating the costs for measures to reduce the likelihood of a major accident;
3. Estimating the benefits of these measures.

When reviewing the documents prior to the meeting, the Chairman noticed that the focus of the GLND and DNV studies was on the first step. He commented that it would be interesting during the forthcoming discussion to hear comments on the other aspects.

After the participants introduced themselves, the Chairman proposed to change the order of presentations, relative to the agenda in the Terms of Reference. He suggested to start with JRC's presentation as the other technical groups have all commented on this study. He also suggested having discussions on specific issues during each of the presentations instead of afterwards, as more time was now available for discussions because of the cancellation of the DNV presentation. These proposals were agreed by the participants. The final list of participants is included in Annex II of this report.

During both presentations (by JRC and GLND respectively), specific questions were asked by both the technical contributors and the observers. From the questions and resulting discussions, the differences in both studies were identified, regarding methodology and assumptions.

Consistent with the agenda, the Chairman invited short statements from the various sponsor groups, Oil & Gas UK, OLF and the Commission. These are summarised in section 6 below.

The Chairman closed the meeting by thanking participants for their contributions. He then presented a brief overview of the main findings from the meeting; this formed the basis of section 4 below.

3.2 Second peer review meeting, 2 May 2012

The Chairman, Dr Bill Nixon, opened the meeting and informed participants that this meeting would be conducted in a similar manner to the previous meeting on 28 March. JRC would start the presentation followed by DNV, outlining the approach taken in their respective studies. The Chairman indicated that he did not have any objections to participants asking questions during the presentations, as was done during the previous meeting. He informed participants that the discussions should focus on the technical issues of the studies performed. Therefore, the agenda did not allow time for individual statements by the sponsor groups, as such statements have been given during the previous meeting. The final list of participants is included in Annex II of this report.

The Chairman repeated his remark made during the previous meeting that the studies performed all had the similar approach:

1. Estimating the annualised costs of a major accident;
2. Estimating the costs for measures to reduce the likelihood of a major accident;
3. Estimating the benefits of these measures.

As the focus of the external studies was on the first step, he would welcome comments from participants on the other steps. DNV remarked that they had not commented on the second and third step; DNV was of the opinion that the Impact Assessment contained too limited information and analysis on the last two steps, which DNV regarded as insufficient for further analysis on their part.

The Chairman closed the meeting by thanking participants for their contributions. He presented a brief overview of the main findings from the meeting, which formed the basis of section 5 below.

4 Main findings of the first peer review meeting

At the close of the first meeting, the Chairman noted that he was not surprised to see differences between the various studies, as all parties experienced limitations regarding availability of data, time and resources. Each study had to invoke its own assumptions and estimation techniques and had arrived at differing outputs. The following topics were identified where different views were expressed by each of the technical groups. Note that no judgement is implied in the commentary below. The intention is, consistent with the Terms of Reference for the meeting, to collate the main differences between the various studies.

4.1 Risk assessment of major accidents

The JRC presentation quoted the OGP aggregated rate for major accidents, based on data from the period 1970 – 2007, as 2.6/year. In the JRC study, the assumption (considered optimistic by the authors) is made that this rate will be halved in the future because of further risk reduction measures, resulting in a rate of 1.3/year. This gave rise to the following comments:

- GLND questioned if the assumed reduction of 50% is realistic, given the results of risk reduction efforts already achieved in the oil and gas industry since the 1970's. Examples where safety has improved over the years are in the areas of helicopter safety and diving safety.
- JRC noted that their study only took into consideration the two most severe categories of accidents, i.e. major accidents with total loss and severe damage. The other two categories of accidents namely accidents with significant damage and minor incidents, were completely excluded from the analysis.

- GLND also questioned the use of data that is currently 40 years old and felt that the older data should be discounted from the analysis as it pre-dates major improvements in understanding and legislation.
- COM responded to GLND that ongoing improvements in helicopter and diving safety are not comparable to process safety improvements, where industry performance targets are not being met in the UK and in Norway.
- JRC considered the reduction of 50% is realistic, given the fact that injuries and fatalities have been reduced by half in the last 20 years, by the introduction of goal setting legislation. However, trends in gas releases on installations as reported by the UK and Norway – which are precursors for major accidents – were at best levelling off or even increasing.
- GLND is of the opinion that if a 50% reduction has been attained in these last years, even a larger reduction must have been achieved since 1970.
- JRC considered that discounting of older data would not be suitable: this would reduce the total dataset, making it less representative and would increase the error margins of the end result.

4.2 Costs associated with the removal of oil spills

In the JRC study, the average clean-up costs per tonne of oil spilled are based on costs in The Netherlands, Norway and the UK, quoted in the Etkin study, giving an average for clean-up costs of oil spills in the North Sea. This gave rise to the following comments:

- GLND questioned why JRC did not use cost factor modifiers for the clean-up costs, as quoted in the Etkin study. This method enables e.g. account to be taken of lower clean-up costs in the event that a spill would not reach a shore.
- JRC considered that the use of the cost modifiers was not appropriate for their study, as their study is generic while the cost modifiers are incident specific (e.g. location, spill size etc).
- JRC considered that the use of some of the specific cost modifiers would be inappropriate for a Macondo type of incident. The Etkin study quotes a cost modifier of 0.01 for very large spills, which would result in very low clean-up costs for these large spills, which is inappropriate in light of clean-up costs experienced during the Macondo incident.
- GLND still felt that some use could have been made of the cost factor modifiers, as they indicate that for offshore installations the costs will be generally below the values used in the JRC study.
- JRC indicated that future costs of oil spills may be higher than those experienced historically, due to increased public pressure following the Macondo incident. See further comment below in paragraph 4.7.

4.3 Frequencies and annualised costs of blowouts

This topic was discussed as a result of the presentation by GLND. GLND is of the opinion that using a single frequency for the subsequent cost assessment - done in the Impact Assessment - is not appropriate, as it does not distinguish between the likelihood of different types of blowouts. In their study, GLND differentiates between the well type, the activity performed in the well and the duration of the blowout. Using costs for blowouts estimated for different types of wells/operations in a study performed for OSPRAG, the GLND study arrives at a considerable lower annualised cost for blowouts than the study performed by JRC. During the subsequent discussions, the following comments were made:

- GLND showed that from a survey of 1070 oil producing wells on the UKCS, 46% cannot flow naturally and only 22% can flow naturally and have a production of more than 1000 bopd. According to GLND, the results of this survey show that the flow rates from the majority of the wells in the North Sea would flow at significantly lower rates than Macondo.
- JRC and other Commission representatives questioned how this information has been incorporated in the calculation of the total costs for a blowout, as oil wells with limited production potential may still have considerable blowout (open flow) potential, given the absence of a treatment system backpressure in a blowout situation.
- JRC considered that the split of 30/70% between drilling and production blowouts over both duration intervals (15-50 days and 50+ days) may not be appropriate. JRC's view is that in the upper part of the duration distribution the split could be much different, with

drilling blowouts representing the dominant type in that part of the duration distribution. In the absence of data to the contrary this, potentially conservative, approach is considered appropriate.

- GLND argued that it couldn't be disputed that blowouts will be split between drilling and production events. This fact is incorporated in the calculations. GLND stated that incident costs will reduce significantly, even allowing for some variability on the 30/70% split.
- JRC questioned if the costs quoted in the GLND study (based on data from the OSPRAG study) included third party compensation costs, as is the case in the upper bound scenario of the JRC study. GLND will refer back to OGUK for further information. Post-meeting comment by GLND: the costs quoted in the OSPRAG study do not include (third party) compensation costs. However, GLND is of the opinion that this does not justify the use of Macondo costs for all blowout events lasting more than 14 days.
- JRC and other Commission representatives questioned if using the lower duration interval (15-50 days) is appropriate. One study indicates that once a blowout remains out-of-control for more than 14 days, chances are higher that it can only be controlled within 50-80 days (to allow time for a relief well)¹.
- GLND remarked that the industry has taken measures to reduce the potential for long duration spill, e.g. actions resulting from the OSPRAG initiative in the UK.
- JRC and other Commission staff commented that it is not clear what assumptions have been made in the OSPRAG study, which forms the basis for the GLND study. This concerns e.g. blowout volumes and clean-up costs. The Commission have no information on the models, etc, used in the OSPRAG work.

Post meeting note: The report is now publicly available online. It may be accessed via http://www.oilandgasuk.co.uk/knowledgecentre/Key_issues.cfm and by clicking on the "joint study" hyperlink.

4.4 Cost of implementing policy options

In the JRC study, differences in compliance costs are given for areas with a goal-setting regime (e.g. North Sea) and a prescriptive regime (e.g. Italy). These costs are expressed per well per year, which resulted in the following comments.

- GLND does not consider expressing compliance costs per well per year as appropriate. They consider these costs are more diverse and should be expressed differently. For example they could be expressed for different categories of installations, depending on POB, production etc.
- JRC noted that the information submitted by the respondents did not allow for a more diverse expression of the compliance costs. Only three companies responded to the questionnaire from the Commission, one being an operator of a flotel which contribution was disregarded as not being representative. Furthermore, the respondents that did contribute did not comment on the format and type of data requested.

4.5 Risk reduction as a result of proposed measures

In the JRC study the risk reduction attained on implementation of policy option 2 is estimated at 50 %. This estimate is based on estimates from safety improvements in the North Sea since the introduction of goal-setting regulation and the arguments that (1) improvements are possible in the area of hydrocarbon releases and well control and (2) the probability of major accidents and their consequences to the environment and coastal economies can be further reduced by integration of environmental risk assessment into the safety case. This led to the following comments:

- GLND questioned if a sensitivity analysis was done on improvements attainable by region. GLND considers that a 50 % reduction of risks in areas which are already considered to have world class regimes may be too optimistic.

¹ Report for Statoil ASA: Miljørisikoanalyse for letebrønn 30/6-28 Crux I Nordsjøen – App. 1 Technical note to blowout scenario analysis (DNV reference: 2011-0830 / 13GN2EA-2, Rev. 00, 2011-07-12)

- GLND and industry are of the opinion that the reduction in annualised costs for major accidents in these areas will be outweighed by the costs required for implementing the proposed measures.
- JRC argued that the cost for implementing the proposed measures could be less in areas that are already close to attaining the best practices.

4.6 Comparison of costs versus benefits

In the various studies, a comparison is made between the costs for implementing the measures and the benefits of the measures, resulting from a reduction of the annualised costs calculated in the respective studies. In addition to the relevant points made at other points above, the following comments were made:

- GLND is of the opinion that for the scenarios considered in their study, the costs for implementing the measures of the proposed Regulation will exceed the benefits, even for the case of the optimistic assumption that incident costs will be reduced by 50%. Only in the case assumed by the Commission (all blowouts lasting more than 14 days will incur similar costs as Macondo) the benefits exceed the regulatory costs.
- JRC observed that GLND's conclusion, in addition to other points made earlier, depended strongly on the scenarios and results of the OSPRAG study. See the comment under paragraph 4.3 regarding the public availability of this work.

4.7 The nature of offshore operations in the future

There was some discussion and debate on the nature of offshore operations in the future, particularly with respect to the development of more complex drilling operations (e.g. more HTHP wells; more difficult operating environments) and the geographical distribution of the drilling activities (i.e. northern versus southern European waters). The Commission remarked that in the Maitland report of December 2011 (containing an independent review of the UK regulatory regime for offshore oil and gas), a recommendation has been made to plan for a worst-case scenario of 90 days for a blowout. In addition, JRC remarked that there is heightened public pressure for a "no expense spared" response to further offshore disasters and that the potential costs associated with future spills could rise as a result which should be taken into account when assessing costs. It was noted and agreed that none of the studies performed to-date had explicitly addressed these points.

5 Main findings of the second peer review meeting

At the close of the second meeting, the Chairman reiterated his view that he was not surprised to see differences between the various studies performed (see section 4). The following topics were identified where the different groups expressed different views. It should be noted again that no judgement is implied in the information presented below; the intention is to capture the main differences between the various approaches.

5.1 Cost of human life

In the Impact Assessment the costs related to loss of human life are mentioned, but these costs were not used in determining the total costs for a major accident. This led to the following remarks:

- DNV questioned why this and many other types of information not used in the report was mentioned. For example, if the costs for a human life are not used in the overall cost calculations, they need not have been mentioned or included in the Impact Assessment.
- JRC commented that these costs have been included for completeness and to inform the readers that these costs were marginal compared to the total costs of a major accident. They also expressed the view that monetization of human life does not fully express the public concerns for such losses.

5.2 Characterising the probability distribution for different release magnitudes

In the JRC study the total cost (i.e. clean-up and third party compensation cost) of the Macondo incident is taken as the upper bound, with the lower bound based on clean-up costs derived from

an environmental risk assessment performed for an actual (Hess) project undertaken on the UKCS. This led to the following remarks.

- DNV considered that the approach taken by JRC is too conservative and should not be described as a likely event. Based on data from the Norwegian CS analysed by DNV, there is a 90% probability that blowout rates will be less than 2-3000 Sm³/d. (The Hess case was >12000 Sm³/d.)
- JRC's view was that the distribution of blowout events has a long tail and that this will have an impact on the average. It is only prudent to take the upper bound of the tail into account when performing risks assessments, using the precautionary principle.
- DNV is of the opinion that this approach is not in accordance with accepted principles for risk assessment. It was more of a worst-case analysis.
- OLF questioned if this approach is in accordance with the Commission's Guidelines for conducting Impact Assessments.
- COM responded that the Impact Assessment has been approved by the Commission's Impact Assessment Board, which implies that the Impact Assessment has been conducted in accordance with the Guidelines.
- JRC questioned what the correlation between blow-out rates and blow-out durations is, and whether DNV data have been analysed to that extent. DNV responded that this was a valid question, but DNV has not identified such correlations. They agreed that this could be investigated in the future. JRC remarked that high correlation between these variables should be expected i.e. that long blowout durations would be combined with high release rates.
- JRC commented that some of the differences observed are explained by the fact that JRC have used data (e.g. regarding frequencies and duration of blowouts) which are available in the public domain. DNV has used their own (proprietary – later published) data to which JRC did not have any access and which may differ from the data used by JRC.
- DNV expressed the view that the problem was more to do with the use of data as opposed to different sources.

5.3 Clean-up costs

In the JRC study, the costs for clean-up of oil spills in the Hess case are derived from the Etkin study, resulting in an average clean-up costs per tonne of spilled oil based on costs incurred in the UK, NL and Norway. For the Macondo case the US Macondo data was used directly. This resulted in the following discussion:

- DNV questioned JRC's focus on large events (Macondo) and their use of a costs per tonne figure, which implied a linear relation between the volume of oil spilled and the costs incurred for clean-up. IMO has adopted a formula showing a non-linear relation between clean-up costs and spilled oil volume. DNV is of the opinion that discounting the IMO formula because it is not in accordance with the experiences of BP at Macondo, is not a sufficient argument given the huge database analysed by IMO.
- JRC expressed the view that the costs for clean-up of oil spills experienced during the Macondo incident cannot be ignored. JRC is also of the opinion that applying the non-linear formula adopted by IMO could seriously underestimate the costs, especially given public and government pressure on oil companies to clean-up oil spills regardless of the effort, which could drive up costs. Based on experience from past severe oil spill accidents such as Prestige and Erica, JRC is of the view that, if a severe accident occurs in European waters, the public and government pressure requiring proper clean-up and compensation for third parties, will be similar to that following the Macondo accident.
- DNV was of the opinion that the Impact assessment is meant to objectively inform policy makers of real costs and benefits, and not to include subjective evaluation of public and government pressure.
- There was disagreement on the extent to which public and government pressure would affect clean-up costs.

5.4 Risk reduction

In the Impact Assessment, a risk reduction of 50% is assumed when all measures of Option 2 are implemented. This resulted in the following comments:

- DNV is of the opinion that the rationale for selecting a 50% risk reduction is not explained in the Impact Assessment. DNV's view was shared by the representatives of OLF and

OGUK, arguing that the majority of oil and gas activities were currently executed in regions which are already considered as world class in the Commission's Impact Assessment.

- OLF mentioned the latest report issued by PSA on the industry performance²: the report shows that hydrocarbon releases in 2011 have declined.
- JRC explained that they have used other qualitative arguments for assuming a 50% risk reduction. Even with declining incident statistics, there are drivers that could increase risks in the offshore oil and gas industry, such as the move towards HTHP wells and increased exploration/production in the southern regions of Europe. This will have an impact on the overall risk reduction attained by the proposed measures.
- DNV and OLF did not accept this view, arguing that the overall risk would be dominated by operations in northern Europe.

5.5 Costs versus benefits

The Commission's Impact Assessment concludes that the reduction of risks resulting from measures implemented by the Commission will outweigh the industry's costs for implementing these measures. This led to the following remarks:

- DNV and OLF (supported by OGUK) felt that the Commission's conclusion is overly optimistic and are of the opinion that the costs for implementing the measures proposed by the Commission are very much greater than the benefits (disproportionately so). This is based on a combination of a number of factors: (1) the recurrence rate for blowouts lasting more than 50 days is much larger than 35 years calculated in the Impact Assessment, (2) the release rate of oil during a blowout will be considerably less than the volume experienced during the Macondo incident and (3) the clean-up costs per tonne of oil will be less than the costs experienced during the Macondo incident.
- JRC are of the opinion that the cost benefit analysis in the Impact Assessment is robust and representative for an incident in Europe. But the costs benefit analysis is only one tool that supports the argument for implementing measures proposed by the Commission. Another argument is also to improve oil and gas operations in Europe and the measures will act on the drivers contributing to the risks in the oil and gas industry.
- JRC also expressed the view that, in light of the uncertainty associated with risk calculations and the associated cost/benefit assessments, there is an argument for making prudent judgements when weighing estimated risk reduction against estimated costs. There should be some gross disproportionality between the costs and the benefits before the proposed measures are not accepted.
- This issue of how judgements may be made when balancing costs and benefits was not discussed in any further detail during the meeting.
- COM is interested in the industry's views on which of the measures proposed are not relevant to reduce risks in the industry.

6 Closing statements by sponsor groups during the first meeting on 28 March 2012.

6.1 Oil & Gas UK

The following remarks were made by Robert Paterson and Andrew Bassett on behalf of OGUK:

- OGUK welcomes this opportunity for a peer review meeting to get a better understanding of the assumptions and methodology used in the study performed on behalf of the Commission. However, OGUK remains unconvinced of some of the assumptions and conclusions in the Commission's study.
- OGUK is not against legislation per se or other actions that result in improvements, but has a problem with both the legal form and content of the proposed Regulation.
- Implementing the Regulation would tie-up considerable resources in both industry and regulators, for no tangible value. These resources will be required to adapt already well-

² Trends in Risk Level in the Petroleum Industry – Summary Report 2011, Norwegian Continental Shelf – (RNNP) Petroleum Safety Authority Norway. The report indicates that hydrocarbon releases in 2011 have declined, after leaks had increased in the period from 2008 to 2010; however, the number of leaks has been reduced to a 1/3 compared to the late 1990's.

established legislation and guidance material in the UK, taking them away from the 'front line' where the hazards are. In this respect OGUK's primary concern is that the Regulation will have a detrimental impact on safety in the UK.

- In addition, the existing safety cases in the UK would all need to be updated to Major Hazard Reports, also requiring considerable resources.
- For these reasons, (and if the EU must legislate at all in this area) OGUK prefers a properly worded Directive that may cause less disruption to existing legislation in the UK.
- Specific requirements and stipulated timescales within the Regulation will impact on existing and new projects; in this context a reference was made to a requirement in the Regulation regarding the 2009 IMO MODU Code.

In a post-meeting note, OGUK added the following remarks:

- It should be noted that several Member States and trade union representatives also share such concerns, as evident at the 31 January 2012 Stakeholder meeting.
- OGUK also have concerns around the powers delegated to the Commission under Articles 34 and 35 of the proposed Regulation.

The Chairman pointed out that a detailed discussion on the legal instrument and on the requirements in the Regulations was outside the scope of this meeting, as indicated in the Terms of Reference. The issues were, however, important and, following the discussion, Jan Panek of the Commission offered the opportunity to have a separate bilateral discussion on these issues with OGUK. It was agreed that such a meeting would be organised. Post-meeting note: this meeting has taken place in Brussels on 12 April 2012.

6.2 OLF

The following remarks were made by Øystein Joranger on behalf of OLF:

- The measures proposed by the Commission in the Regulation will be difficult to implement in Norway. OLF is of the opinion that implementation of the Regulation will reduce the level of safety and environmental protection in Norway. However, OLF is aware that the Commission is in contact with representatives of the Norwegian government on these issues.
- Introduction of the Major Hazard Report in line with the safety case system will not improve safety in oil and gas operations in Norway, it will only increase costs.
- OLF questions the relevance of protection of the Arctic environment quoted in the Impact Assessment and Regulation, as there are no EU Member States that are active in the Arctic region.

6.3 European Commission

The following remarks were made by Jan Panek on behalf of the European Commission:

- The Commission welcomes this exchange of views on the analysis performed by the individual contributors and the discussion on the technical issues in the studies.
- The Impact Assessment does not distinguish between the choice of the legal instrument. It gives a choice of options, from which the Commission has selected option 2 without specifying the instrument.
- The Commission questioned which of the specific measures proposed in the Impact Assessment would not meet the approval of industry and is prepared to have a separate discussion with OGUK on this issue. In this context, Taf Powell of the Commission highlighted some of the proposed measures in the Impact Assessment (pages 56 – 57): integrated risks assessment for both health, safety and environmental protection, the establishment of a competent authority in each jurisdiction, improved transparency of industry and competent authorities performance and sharing of information, effective emergency response to major offshore accidents including cross-border availability of emergency response assets.
- In addition to these measures, the Commission has established the EU Offshore Authorities Group, consisting of representatives of the offshore oil and gas regulator of Member States. The decision establishing the Authorities Group also offers the possibility for industry to participate in the work of the Group to spread best practices to stakeholders in the EU.

7 Chair's Closing Remarks

At the outset, it is worth re-iterating the overall scope of the two meetings and the resulting summary report. The Terms of Reference made it clear that the overall remit was to focus on the technical aspects of the various analyses, with the aim of identifying any differences in the data used and the methodologies deployed. Policy issues associated with the technical analyses, relating to, for example, the legal instrument through which future risk management measures might be implemented, were out of scope.

The above summaries have served to capture the essence of the issues raised during the two peer review meetings and identify the main points of difference between the three sets of analyses. It is recognised that the Oil & Gas UK/GLND and OLF/DNV studies are not set out as full cost-benefit analyses. They were designed to investigate a number of features of the JRC work and demonstrate the effect on the cost-benefit balance of some different assumptions and approaches. Nevertheless, the resulting debate between the various parties has provided some valuable insights into sources of uncertainty and likely overall uncertainty levels.

It is clear that a detailed, comprehensive risk assessment and cost-benefit analysis, which reflects both the historical position and the potential changes associated with future drilling operations in EU waters, is difficult to conduct. The data and resource requirements would be very significant and it would take time to achieve a degree of consensus on some key assumptions, relating to, for example, how the hazard profile might change in future years. As a consequence, each of the three analyses has made different simplifying assumptions and approximations. In view of this, it is not surprising that the results differ between them.

This is exemplified by the differing approaches to the characterisation of the distribution of oil-spill size and probability of occurrence. The JRC study essentially characterised the profile by one point, focussed on large releases such as that experienced following the Macondo accident. JRC's view is that the low probability end of the distribution may not be adequately represented in the historical data and could have a marked impact on the overall risk profile. They therefore placed some focus on the high-risk end of the spectrum. The other analyses adopted a higher-resolution representation of the distribution. GLND, for example, identified a number of release scenarios of differing magnitude and probability, assessed these and combined the results to evaluate the overall risk. The GLND and DNV analyses both relied on the use of historical data. At its simplest, GLND and DNV are of the view that the JRC analysis did not adequately account for the historical data and was overly conservative; JRC's view is that their approach better reflected the low probability/high consequence tail of the distribution and their views of how the risk might change as drilling operations in EU waters evolve. Similar issues lie behind many of the points noted in the meeting summaries above, particularly in relation to the economic costs associated with spills. So what does all this mean?

In reality, in light of the inherent uncertainties associated with the work of JRC, GLND and DNV, it is difficult, through meetings of the kind summarised above, to evaluate the extent to which any analysis is or is not conservative. In essence, none of the analyses is wholly right or wrong. They reflect the effect of differing assumptions and approaches. Some may be more conservative than others, although the extent of any conservatism, or its converse, is difficult to judge. However, the meetings have been extremely valuable in surfacing key issues and sources of difference and uncertainty, and there may be some scope to build on this.

In terms of the future, further discussion and collaborative working between the various technical teams, potentially including others not involved to-date and incorporating data that was not widely available before the peer review meetings, may lead to an updated analysis with a greater degree of consensus and reduced uncertainty. The technical merits of doing this are clear. However, such a detailed approach, covering the full extent of the risk assessments and cost-benefit analyses, would need careful consideration, as it would be very time consuming and resource-intensive. A less

ambitious, though still challenging, starting point might see various technical teams addressing the issue of the probabilities of accidents in European waters, reflecting all current data, the effect of likely trends in drilling activity and taking account of human factors. Technical consensus may still be difficult but the activity would represent a valuable journey, for all stakeholders, in the risk management process.

As a final point, it is worth briefly addressing the very general issue of decision-making in the light of inherent uncertainty. The issue was not considered in detail at the peer review meetings but lay behind all of the analyses considered and was highlighted by some of the discussion. It is a difficult area and at the forefront of the state-of-the-art in the use of extremely valuable tools such as risk assessments and cost-benefit analyses. There may, therefore, be some value in an activity directed at sharing the knowledge and experiences of organisations and individuals who have developed approaches to account for uncertainty in decision-making.

Before closing, the Chair would like to thank all those who participated in the two meetings. They assisted in ensuring the discussions remained within scope and contributed to some very valuable discussion on the various technical aspects of the different approaches. Without this, the task in hand would have been extremely difficult and much less enjoyable than it proved to be.

TECHNICAL PEER REVIEW OF THE RISK ASSESSMENTS

TERMS OF REFERENCE

1. Purpose - Summary

The European Commission has performed a study as part of the Impact Assessment for the proposed Regulation on offshore safety, on the frequency and costs of oil blowouts (and other major accidents) in the offshore oil and gas industry. Recently, the industry associations Oil & Gas UK and OLF have commissioned similar studies (conducted by GL Noble Denton and DNV respectively), arriving at different conclusions than the results of the study performed by the Commission. The Commission will host a peer review meeting between the authors of the three studies with observers from the industry associations on 28 March 2012, 13.00 – 17.30 hrs, at the Albert Borchette Conference Centre, Room AB 3.04, Rue Froissart 36, 1040 Brussels, to objectively identify where the studies agree and where and how the studies differ.

2. Background

The Impact Assessment³ performed for the proposal for a Regulation on safety of oil and gas activities⁴ contains a risk and cost assessment, for oil blowouts (and other major accidents) resulting from these activities in EU waters⁵. For the assessment, the Commission used published incident statistics and actual incidents that have occurred in the offshore oil and gas industry in the world. Based on the assessment, the Commission concluded in the Impact Assessment, that the risk of a blowout (lasting more than 14 days) was significant (on average once every 35 years), with an average annualised cost of €140 to 850 million.

After publication of the Impact Assessment, the Norwegian oil and gas trade association OLF commissioned a study performed by DNV on blowout frequencies and associated costs related to blowouts on the Norwegian and UK Continental Shelf⁶. The results of this study were summarized by OLF in a letter to DG Energy that the annualised costs for oil spills on the Norwegian and UK Continental Shelf was estimated between €4 and 91 million, significantly lower than the Commission's Assessment⁷.

The UK oil and gas trade association Oil & Gas UK (OGUK) commissioned a similar study on the frequency and costs of blowout events, performed by GL Noble Denton⁸. This study concluded that the average annualised cost for blowout events was in the order of €62 million, with a total annualised cost of all major accidents of €127 million.

In addition, the industry reports challenged the Commission's estimate that the measures in the proposed Regulation will reduce the overall annual levelized cost for damage by approx. 50 %. The industry reports argue that this reduction is grossly overestimated, as the Impact Assessment considers the legislative framework in the countries around the North Sea as best in class. The industry studies do not provide alternative estimates on the reduction. It needs to be pointed out also that in the Impact Assessment, the Commission has concluded that none of the regimes in the EU attain all the best practices as proposed in the Regulation, although some are close. This means that even the best performing countries will benefit from the proposed Regulation.

Both industry studies shared the conclusion that the risk assessment of the Commission is fundamentally flawed, whereas the Commission considers that the industry studies incorporate assumptions that are no longer sufficient, post Macondo.

The differences in the results of the studies were also highlighted at the stakeholder meeting between industry, trade unions, NGO's and the Commission held on 31 January 2012 in Brussels. During the stakeholder meeting it was agreed that a separate meeting would be arranged between industry and the Commission to discuss the studies performed.

³ SEC(2011) 1293 final, 27/10/2011

⁴ COM(2011) 688 final, 27/10/2011

⁵ SEC(2010) 1292 final, Annexes I and IV, 27/10/2011.

⁶ Memo from DNV to OLF, 13QEL2Z-1/BRUDE, 16/01/2012.

⁷ Letter from Alfred Nordgård (OLF) to Philip Lowe (DG ENERGY), reference AN/ED, 23/01/2012

⁸ GL Noble Denton Report Number: AA/77-01-01/11959, November 2011.

3. Objectives

The objectives of the meeting are to objectively identify the following aspects in the studies performed:

- the main similarities in the studies, both in methodologies and conclusions;
- the main differences in the studies, and;
- account for the reasons for the differences.

4. Method

To deliver the objectives identified above, a meeting is scheduled with representatives from OGUK, OLF, GL Noble Denton, DNV and the Commission (DG Energy and JRC). The meeting will be chaired by an (independent) representative from the UK Health and Safety Laboratory, to maintain focus during the discussions and monitor progress in line with the agenda.

After opening of the meeting, the three (technical) contributors to the studies are invited to give a short presentation summarizing their respective study and the conclusions. The speakers are expected to focus in particular on the technical base of their risk assessments with the aim of isolating any fundamental differences in the data and/or the methodologies that have produced the different conclusions in the subject reports. From these initial presentations, specific topics will be identified for further technical discussion so as to clarify the source and nature of the statistical variations in the reports. At the end of the meeting, the contributors and sponsor groups are given the opportunity to provide short statements. The meeting will be concluded with a summary by the Chair.

5. Agenda & Participants

The following agenda is proposed:

Time	Session	Topic/Speaker/Lead
13:00		Registration
13:15	Opening	Chairman (tba)
13:30	DNV Study	Summary of work done & conclusions
13:50	GL ND Study	Summary of work done & conclusions
14:10	JRC Study	Summary of work done & conclusions
14:30	Initial analysis	Agreement of topics for further discussion
15:00		Break
15:20	Detailed discussions	Discussion on agreed topics
16:50	Statements	Short statements by DNV/GL ND/JRC
17:05		Short response by OLF/OGUK/COM
17:20	Summary	Summing-up by Chair
17:30	Close	Meeting close

The meeting will be attended by:

Name	Organisation	Role/function
Bill Nixon	HSL (UK)	Chairman
Andrew Bassett	Oil & Gas UK	Observer
Robert Paterson	Oil & Gas UK	Observer
Douglas Michael Johnson	Noble Denton	Technical contributor
John Morgan	Noble Denton	Technical contributor
Egil Dragsund	OLF	Observer
Øystein Joranger	OLF	Observer
Ketil Djønne (tbc)	DNV	Technical contributor
Odd Willy Brude	DNV	Technical contributor
Marcus Wiemann	OGP	Observer
Michalis Christou	COM / JRC-IET	Technical contributor
Ivan Pearson	COM / JRC-IET	Technical contributor
Ricardo Bolado Lavin	COM / JRC-IET	Technical contributor

Name	Organisation	Role/function
Jan Panek	COM / DG Energy	Observer (Head of unit B3)
Eero Ailio	COM / DG Energy	Observer
Taf Powell	COM / DG Energy	Observer
Hans Weenink	COM / DG Energy	Observer
David Schreib	COM / DG Energy	Observer

6. Scope

The intention of the meeting is to have an objective, technical discussion on the studies performed by the three parties. As a result, the discussion will focus on specific elements of the studies, e.g.:

- the methods and risk data used;
- the scenarios considered, e.g. blowout volumes and duration;
- relation between blowout volumes and production volumes of oil wells;
- specific operations considered, e.g. HPHT exploration wells;
- the cost factors assumed in the calculations, e.g. cost for oil spill removal, third party compensation etc.;

The choice of a Regulation as the legal instrument

Although a core element of the Impact Assessment, the legal instrument is not related to the business of the meeting, i.e. it is independent of the cost/benefit analysis. The Regulation is currently under the competency of the Council and, shortly, the European Parliament.

The individual/specific measures in the proposed Regulation

The selected measures act directly upon all of the key drivers to the problem that risks of an offshore major accident are too high and may be reduced, and integrate current best practice thus avoiding the risk inherent in applying untried, impracticable measures. As the measures are part of the Regulation, they too are under the competency of the Council and, shortly, the European Parliament.

7. Reporting & Deliverables

The Chair will prepare a technical summary report and agree this with the technical contributors prior to making it public.

Final list of attendees, first peer review meeting 28 March 2012

Name	Organisation	Role/function
Bill Nixon	HSL (UK)	Chairman
Andrew Bassett	Oil & Gas UK	Observer
Robert Paterson	Oil & Gas UK	Observer
Douglas Michael Johnson	Noble Denton	Technical contributor
John Morgan	Noble Denton	Technical contributor
Øystein Joranger	OLF	Observer
Marcus Wiemann	OGP	Observer
Michalis Christou	COM / JRC-IET	Technical contributor
Ivan Pearson	COM / JRC-IET	Technical contributor
Ricardo Bolado Lavin	COM / JRC-IET	Technical contributor
Jan Panek	COM / DG Energy	Observer (Head of unit B3)
Eero Ailio	COM / DG Energy	Observer
Taf Powell	COM / DG Energy	Observer
Hans Weenink	COM / DG Energy	Observer
David Schreib	COM / DG Energy	Observer

Final list of attendees, second peer review meeting 2 May 2012

Name	Organisation	Role/function
Bill Nixon	HSL (UK)	Chairman
Egil Dragsund	OLF	Observer
Alfred Nordgård	OLF	Observer
Odd Willy Brude	DNV	Technical contributor
Rolf Skjong	DNV	Technical contributor
Andrew Bassett	Oil & Gas UK	Observer
Bernhard Vanheule	OGP	Observer
Michalis Christou	COM / JRC-IET	Technical contributor
Ivan Pearson	COM / JRC-IET	Technical contributor
Ricardo Bolado Lavin	COM / JRC-IET	Technical contributor
Marcelo Masera	COM / JRC-IET	Technical contributor (p.t.)
Eero Ailio	COM / DG Energy	Observer (p.t.)
Taf Powell	COM / DG Energy	Observer
Hans Weenink	COM / DG Energy	Observer
David Schreib	COM / DG Energy	Observer