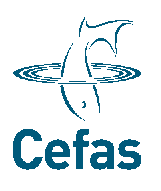
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**Executive Summary**

It remains apparent from the day that the financial figures are stark, with the decommissioning cost in the UK sector alone now estimated at 100 billion, approximately £70 billion of which may have to be paid by the British taxpayer.

There was a consensus that robust science should underpin the decision-making process, but there was disagreement to the extent and usefulness of data collected to date.

The hypotheses-based, INSITE programme (which includes wrecks as well as oil and gas installations) was seen as a welcome initiative. Much of its success, however, would depend on the transparency of its process and the clear demonstration of its independence in both questions asked and conclusions reached.

The initiative, however, would begin shining a light on current legislation, which was considered by a number in the audience as being inconsistent.

**Session 1 – An overview of decommissioning – Setting the scene**

**Callum Falconer, Marathon Oil:**

* £100 billion for decommissioning of North Sea oil rigs (£70 billion by government?)
* Call for science to shape the decision-making of decommissioning.

**Moya Crawford, Deep Tek:**

* SUT responsible for salvage and removal of man-made structures
* Thus far the decisions on which structures to remove and which to leave in place have been led by emotions and subjectivity (shipwrecks *versus* oil and gas installations)
* What evidence do we have to suggest that complete removal is more beneficial than partial removal or leaving *in situ*?
* Call for science to provide facts to improve the subjective nature of current decision-making.

**Brian Nixon, Decom North Sea:**

* 475 structures have to be removed over the coming years
* Pipelines 10,000km and 5,000 wells
* DECOM is not interested in lobbying O&G interest, but tries to facilitate the process of decommissioning by making sure that infrastructure and plans are in place to make the process as efficient as possible.

**Sarah Dacre & Tracy Edwards, DECC:**

* Law to which the UK is a signatory requires the removal of structures that have been built since 1994
* Exceptions are structures over 10,000Te and concrete installations (OSPAR 1998)
* next review of OSPAR is scheduled for 2018
* Environmental impact assessments that are currently being looked into: leaking rate of drill cuttings (oil based cuttings), chemical contamination, benthic disturbances, CO2 emissions, nature conservation implications (noise & explosives etc.), other uses of the seabed among others
* Call for more sophisticated approaches for the development and enhancement of monitoring, such as better collaboration (i.e. alignment of time and effort).

**Vidar Ahjem, DNV:**

* The existence of many overlapping and partially conflicting legislations pose a problem for O&G companies; which rules to apply?
* DNV as a classification society develops clear rules, standards for Offshore operation, among other activity. Also it provides guidelines for best practice and how processes can be adapted to the existing rules
* Technical information on how qualification process for new technology works and how this could be applied to qualification of decommissioning processes; short-term as well as long-term.

**Discussion Session 1 (key points):**

* Inconsistencies in current treatment of man-made structures which is highly subjective; referring to ships *versus* oil and gas installations (comment by Moya)
* How do we assure that stakeholder concerns are taken into account? (Question to DECC)
* What are the implications of the decommissioning legislation for the renewable offshore energy structures? (Question to DECC)
* Different perceptions between structures on land and underwater structures. On land there would be no doubt that structures would have to be removed, while for under water structures this seems to be perceived as arguable (comment DECC)
* It is wrong-thinking to suggest that ships which have sunk or foundered and go to the bottom completely unprepared may be less harmful to the marine environment that oil and gas structures that have been prepared. (comment by Moya)
* Scientists need access to the rigs to conduct their research and close the gap between observation and evidence. (Comment)
* Is it possible to ever agree on what has to be done, as there seem to be so many potential solutions for decommissioning? (Question to DECOM)

**Session 2 – The Oil & Gas community**

**John Allan, CNR International:**

* Mostly talking about the Murchison platform NE of Shetland
* Approval of decommissioning preparation plan probably in 2014; followed by a long and expensive process of removal
* Rules for decommissioning are different on every continent
* Is it possible to remove the large amounts of drill cuttings?
* Impossible to remove the foundations of structures that are in the seafloor.
* The opinions on the right decommissioning process are wide spread even among environmental organisations: Greenpeace wants full removal including drill cuttings while JNCC would recommend leaving drill cuttings in place.
* The latter poses the question if it will be possible to come to a solution that suits everyone?

**Win Thornton, BP:**

* Artificial reef programmes in the Gulf of Mexico where the O&G structures are very close to the coast
* Outcry by stakeholders about the decommissioning plans of the US government of full removal; stakeholder led process from 1984 onwards to change legislation
* Involved stakeholders: anglers, divers, and environmental NGOs
* There was no evidence base at that time and thus and adaptive management approach was taken
* The liability for the wells stayed with the operator, but liability for the installation was transferred to the state.
* In shallower waters, some parts steel jackets were cut off to avoid navigational hazards
* Programmes of decommissioning were different in each state and mainly adapted to the needs of the involved stakeholders.
* Savings programme implemented to fund research and maintenance of structures.

**Evan Williams, AMEC:**

* Spoke about cost-benefit analysis; economic value of decommissioning
* The benefits of decommissioning to society are not well understood
* What we decide to do depends on our will to face the socio-economic challenges involved; the decommissioning process is largely a societal issue and different options involve different costs and benefits, but economics can help to understand better the trade-offs.

**Richard Heard & Graham Shimmield INSITE:**

* The timing for a meeting between scientists and industry is excellent as decisions have to be made quite soon.
* Currently planning the foundation phase for INSITE; working from 2014 onwards
* Even though decommissioning is not a new phenomenon, we are still discussing how research and decision making can come together
* Highlights four guiding hypotheses for the research JIP, which research proposals should then embrace at least partially (e.g. each structure is a different habitat; large inter-connected reef system provided by the rig structures)
* There will be a pre-proposal process to see where proposals and hypothesis match up, then proposals will be forwarded to independent reviewers
* Pre-proposal process will start from November 2013 onwards
* The challenge for the science community will be to proof what the effects of man-made structures on the sea are.

**Discussion Session 2 (key points):**

* Value-laden judgements are actually not a bad thing (referring to critiques that many decisions around decommissioning are not objective but based on values). We take them all the time. (comment by Evan)
* What are the effects of fisheries exclusion zones around the rigs in the Gulf of Mexico? (question to Win)
* What was done to extend the life-time of rigs in the GoM? (question to Win)
* The INSITE program could need another 10 years to provide evidence for much needed answers today. By that time the peak decommissioning might be already over. (Question to Richard).
* We are pressing to meet the 2018 OSPAR deadline to provide evidence on a timely basis. The science needs to be undertaken as an imperative. (comment by Richard)
* INSITE is a good start and opportunities will still be there in 10 years time and further into the future. (comment by Win)
* What parameters are actually considered in the impact assessments? Will all impacts of man-made structures be considered? (question to John)
* No predetermined set of parameters. The objective of the research initiative is to figure out all the impacts of structures. (comment by Richard)
* More evidence for a more holistic EIA (Environmental Impact assessment) would be welcome (comment by DECC)

**Session 3 – The Scientific community**

**Andrew Sneddon, URS:**

* There is a vast amount of data out there. We have been conducting research in this area already 25 years ago. (Subsequent challenge by Ian Boyd as to whether this data is in a usable format)

**Dave Paterson, MASTS:**

* Description of analogous study around the Shetland Oil Terminal
* Paradigm shifts from species, to community, to ecosystem-based research and conservation approaches (shifting scales); currently ecosystem approach
* Assess the significance of impacts on processes, functionality and biodiversity
* Many people are working on monitoring the environment around Shetland and in order to maintain it as pristine as possible.

**Richard Bates, University of St Andrews:**

* The North Sea is like a 40 years experiment with its go & no-go zones
* Most interested in the archaeology of the North Sea
* The current state of the North Sea could be classified as degraded
* Poses the question if existing structures could be used for other purposes such as renewable wind farms or as a fisheries management tool (referring to the exclusion zones around the structures)

**David Runciman, Aquatera:**

* Necessity to increase the potential for knowledge transfer; much data is already out there
* call to make monitoring information available; avoid that information is being lost or collected twice

**John Pinnegar, Cefas:**

* Interested in the connectivity between sites (on a model basis)
* danger of spreading invasive species which might use off-shore structures as stepping stones
* Modelling behaviour of fishermen as a result of exclusions zones; displacement of fishing effort as a result of MPAs with lower fish stocks in other areas
* The Atlantis model can take into account all biophysical, socio-economic, and biological data in one model
* Modelling can answer many questions; they are often asked to predict where lost shipping containers or corpses are washed ashore

**Tom Wilding, SAMS:**

* Poor reputation of artificial reefs (AR), because this was used as an excuse for waste dumping some decades ago (e.g. old tyres or ships)
* Example from Loch Linnhe to test reef complexity effects
* Coastal protection could be considered AR, also the Palm of Dubai, wind turbines etc.
* By removing oil and gas installations in the North Sea, reef species including protected species such as cold-water corals will be removed
* Two major questions: How long will structures hold against corrosion (50-300 years) and what will happen with them afterwards? Also is it fair to leave these structures in the sea so that future generations have to deal with them?

**Debbie Russell, SMRU:**

* Higher abundance of harbour porpoises around man-made structures such as oil and gas installations and pipelines; potentially looking for shelter, reduced fishing effort and prey increased, but these are only hypotheses
* Seals have been observed to follow pipelines, which they might use for foraging.

**Discussion session 3 (key points):**

* How reliable is it to base data for models on one or few species? (Question to John Pinnegar)
* Quite reliable as indicators; knock-on effects might be highlighted. (Comment John Pinnegar)
* What about your interest in doing an experiment on oil and gas installations as artificial reefs? (Question to Tom Wilding)
* This would mainly depend on the research question. There are many different questions. One could be how certain fish species are influenced by the rig structures. (Comment Tom Wilding)
* There is much anecdotal evidence that seals are following pipelines and also that fishermen target them for fish despite the risk of losing their fishing gear. Both might indicate that fish is more abundant here. (Comment to Debbie Russell)
* What are the effects of changing from soft sediment to reef habitat? (Question to Tom Wilding)
* Halo effect of reefs around the structures, but to what extend we cannot say. (Comment Tom Wilding)
* Is there a consensus among the science community how the North Sea should look like? A benchmark?
* Plea to put more money into the £3 million of the INSITE, because it might not seem a lot, but might offer future knock-on effects for more collaborations and funding. (Comment by Dave Patterson).

**Session 4 – The way forward**

**Ian Boyd, Defra:**

* It is great to have marine stakeholders in one room, even though there might have been some tensions (e.g. Brent Spar).
* Agrees that there are inconsistencies in the current decommissioning legislation. (Reference to Moya Crawford)
* People do not always make logical decisions and they learn slowly; we as scientists have to provide the evidence and challenge current ways of thinking
* There has been extreme exploitation of the North Sea over the past 50 years but the ecosystem is still working; as a conclusion we should test if these man-made structures have regional effects
* We challenge the rules; legislation can be changed
* We have to make sure the standards of science are maintained

**Discussion session 4 (key points):**

* Good start! Think about how O&G and science could work together. Call for more collaborative effort. (Comment Dave Patterson)
* Are the datasets that were mentioned actually available somewhere? (Question by Tom Wilding)
* data from 25 years ago and further; several 100 surveys and database should exist; the dataset might be very limited to answer questions on decommissioning effects; different perceptions between scientists and industry and data would need to have all metadata to be of interest for the former. (Gathered comments on the question)
* The current trend is that governmental bodies are asking for better data for the environmental impact assessments. (Comment DECC)
* On what kind of question should we as scientists focus on? (Question to INSITE)
* INSITE tries to provide the science framework, timescale (short), science standards together with what industry needs to know. (Comment INSITE)
* Will the INSITE hypotheses actually determine the questions that can be asked in the pre-proposals? (Question to INSITE)
* There is scope within the framework to allow flexibility with the hypotheses; rather than setting the framework it would be better to build ideas from the science community into the framework and guiding hypothesis (gathered comments to question).
* How would keeping the oil and gas installations impact on other uses of the North Sea?
* It is necessary to broaden the scope of research so that renewable energy sector is included as well; very broad definition of man-made structures so that shipwrecks among others are included; look into existing research which might not have studied oil and gas installations and

their effects, but at least other structures such as wind turbines; wrecks might offer a good baseline as some have been in the water for decades and might show the long-time effects.

* Different perceptions between science and industry of what data means; access to databases have to be improved if such exist; look more for overlaps between monitoring of oil and gas installations and science projects to save money and time; there might be interests that go beyond finding out about the potential effects of decommissioning (comment by Ian Boyd)
* Closer working relationship with MASTS would be an excellent opportunity (comment Richard Heard).

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