

ENVIRONMENTAL REGULATION

SDN

POLLUTION CONTROL IN THE GLOBAL OIL INDUSTRY IN RELATION
TO REFORM IN NIGERIA



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POLICY RECOMMENDATIONS FOR THE PETROLEUM INDUSTRY BILL

1) SEPARATING REGULATION FROM REVENUE

International 'best practice' clearly suggests that a separation between the regulators of the industry and anything to do with revenue raising from oil is fundamental. It is necessary because the regulators must have powers to deny or take away a drilling license to enforce rules around health, safety and environmental good practice. Without the ability to take action when rules are broken, the regulators become powerless to enforce good practice.

If the regulators, or indeed the ministry, are dependent on oil for revenue in any way, situations may arise where the regulators may be reluctant to enforce 'best practice' because enforcement may reduce its own income. This creates a disincentive for the regulators to take any necessary action, if operators break the rules. Enforcing best practice may well require that operators suspend production. If the regulators are dependent on that production for revenue, they may well become insufficiently alert to any careless activities on the part of operators, or indeed turn a blind eye to it.

It is not the task of an independent regulator to increase production, but rather to make sure that that production is carried out safely and without damage to the environment. It must be capable of both fining companies and suspending their operations. Without such powers, it is, in effect, toothless. While in most circumstances such powers may not be required, good regulation necessarily requires them.

Where regulators have previously been drawn into the process of encouraging production for revenue reasons, accidents have invariably followed. In the 1980s, in the United Kingdom, the Department of Energy (DEn) was charged principally with the encouragement of North Sea oil development, but it was also charged with developing a health and safety regime and environmental best practice. However such was the desire of then government to expand production, that the operators were more or less left to pursue their own devices. The result was Piper Alpha and the deaths of 167 oil workers resulting from a catalogue of human error. The subsequent Cullen Inquiry made 106 recommendations, but by far the most important was the decision to remove the regulation of safety from the DEn to an independent specialist regulator, the Health and Safety Executive. It was thought that the DEn had a conflict of interest regarding its procedures.

Much the same thing happened in Australia, after the Montara spill. At the time, environmental regulation was largely handled by state governments, who were also responsible for licensing and thus also raised revenue from oil production. Again, the subsequent inquiry demanded a separation of these functions and a new central government independent regulator was set up.

Such was the impact of the Deepwater Horizon disaster, that the US Government reorganised its offshore oil regime. The regulator, the Minerals Management Service of the Department of the Interior, was deemed inadequate, not least because the same body was responsible for royalty collection. Once again, the revenue raising aspect of oil production was separated off, and the responsibility for offshore safety, inspections and environmental management given to a new organisation, the Bureau of Safety and Environmental Enforcement.

Elsewhere, making the regulator truly independent of revenue raising functions has been complicated by the existence, as in Nigeria, of a national petroleum corporation. In Mexico, where the Minister for Energy is also the chairman of Pemex, Pemex has been widely criticised for decades regarding thefts of oil, unnecessary expenditure and failure to employ good recovery techniques. However, falling oil production prompted the formation of the independent National Hydrocarbon Commission (NHC). While this organisation has no direct legal powers of enforcement, it has used public opinion to force the company to pay much more attention to potential risks, particularly as it moves into deeper water.

Brazil's Petrobras has had a similar problem. Its regulator, the National Petroleum Agency (ANC) has been widely criticised as being too close to Petrobras, but has more recently started to be more aggressive, largely because of a spill in Chevron's Frade field, where it has stopped the operator continuing to drill. Nonetheless, this action is seen by sceptics of its independence to be the result of a fear that a Brazil might have a deepwater accident like Macondo.

Overall, to be truly independent, the regulator should be separated from any suggestion that it has an interest in maximising oil production because it receives its revenue from it. Failure to establish this leads to a widespread belief that the regulator has other priorities than safety and environmental protection and is thus too close to the industry to be effective.

2) AN INDEPENDENT REGULATOR

To be truly independent, a regulator must not merely be detached from decisions about revenue raising, but also have the ability to enforce its regulations on the oil industry. It must also have the expertise to recognise dangerous practices and understand all the technology of the industry it controls. Consequently, its staff must be highly knowledgeable about the oil industry and have experience of its activities. Equally, to be successful, those involved in regulation have to be well rewarded on a par with the industry itself to minimise the potential for corruption. The staff of an independent regulator should be regarded as an elite.

In terms of global 'best practice' it is not the job of an independent regulator to prescribe what the oil companies will do. The function of the regulator is to approve plans made by the operator, not to write those plans itself. This is in line with the general trend in global regulation, which is towards transferring all the risks of oil production from government to the operators. In effect, it is not the regulators job to determine how or what technology is used, or how installations should be staffed. It is the regulator's job to establish that the technology is adequate and the oil workers are competent.

This process of analysis basically involves two distinct halves. First the regulator must establish that the operator is fit to do what it proposes as a company. Is the proposed operator financially capable of adequately funding what is necessary? Can it bear the potential liabilities in terms of compensation and clean-up that would be required in an emergency? In effect, is it solvent and insured and does it have a good track record for safety and probity?

Secondly, in relation to the company as a whole, does it have a good safety and environmental culture? Does it have an adequate Safety Management System (SMS)? Here the regulator must exercise judgement in relation to the 'atmosphere' in a company. This is not simply about appearances and track record, as track records tend to vary around the world, largely relating to how well the industry is regulated. It is really about the workforce. Are they trained and competent and how well are they managed? Does the company encourage workforce involvement in decision-making and welcome suggestions? It has become obvious after a number of disasters that no matter how excellent the technology, the workforce is key to avoiding accidents. If a company is indifferent to the suggestions and observations of its personnel, and management is dictatorial, it may well be heading for a disaster. As many post-accident inquiries have shown, there is frequently someone who predicted problems who was ignored.

These must include an 'oil pollution emergency plan' or OPEP. This should include a great deal of environmental information about the site and also about the type of oil produced and flow rates. It should clearly show how the operator would deal with an environmental emergency, should one arise. This will include an effective action plan of what resources the company can bring to bear in the event of a spill. This will include blow-out contingency plans, including estimates as to how and how quickly any blow-out can be capped. In effect, the OPEP should provide a plan for any potential emergency, along with a step-by-step list of actions to be taken. This will include a hierarchy of personnel to be contacted. The OPEP thus goes further than an Environmental Impact Statement, since it deals with emergency response, as well as the potential level of damage.

It is for the regulator to agree to the OPEP and analyse it for potential flaws. However, once the overall plan for a new installation is agreed, the job is not finished. It is the responsibility of the regulator to make sure that these agreed plans are actually carried out. This will involve regular inspections of the facility. In this regard the inspectors must have the right to question management and the workforce as well as access to the installation.

Faced by any divergence of the operator from the original plan must be explained and justified. If it is not, then the regulator must have the power to force the company to do what it is required. In this regard, the regulator must have a series of sanctions ranging from enforcement notices to fines and restrictions on production. It must also be made clear that failure to comply has consequences ranging from an increase in inspections to a reluctance to grant new licenses. The frequency of inspections should not only relate to the track record of compliance, but also take into account the age of the facility, the potential impact of a spill and the number of incidents. In effect, if company develops a bad track record, it will be subjected to greater scrutiny.

Overall, the regulator must have an arms-length relationship with the industry. This does not mean that it is unfriendly, but rather that it must be one of mutual respect. The industry must be conscious that, while the regulator does not dictate its activities, it does have the power to stop them in the event of any failure to keep to agreed plans.

3) EGASPIN: GUIDELINE OR LAW?

Nigeria has a substantial body of environmental law. Its basis lies in section 20 of the 1999 Constitution of the Federal Republic. This contains provisions for the protection of the water supply, air, forests and wildlife at a fundamental level. This is supported by the Federal Environmental Protection Agency Act of 1988 (FEPA), which provides environmental protection in relation to effluent, pollution abatement, and the management of solid and hazardous wastes. This in turn is backed up by the Environmental Impact Assessment Act of 1992, which requires that an environmental impact assessment for all major industries, requiring approval of the environment ministry. The country also has the Harmful Wastes (Special Criminal Provisions) Act of 1988. Finally, specific to the oil industry, it has the Environmental Guidelines and Standards for the Petroleum Industry in Nigeria (EGASPIN) produced by the Department of Petroleum Resources (DPR).

In short, Nigeria is not short of basic laws to protect the environment, stemming from its constitution. It also has an apparatus of environmental law, produced by its individual states. Legally, there is also an obligation on public authorities to make available information relating to pollution and produced guidelines. Even without EGASPIN, sections 26 and 27 of the FEPA Act, the officers of the environment ministry have the power to require the production of permits, to enter and search any land, building, or vessel and they can cause to be arrested any person whom they have reason to believe has committed an offence against the Act and seize any item or substance that has been used in commission of an offence. Section 11 of the Harmful Wastes Act empowers the minister to seal off an area or a site where harmful waste is dumped.

However, while the oil industry could be regulated under FEPA, in practice it is the DPR that regulates the industry under EGASPIN.

Revised in 2002 from the original 1991 version, EGASPIN is designed to minimise oil pollution. It also sets out the approach to be adopted regarding contamination of the soil and groundwater, with the person responsible for the contamination required to restore the soil and groundwater to appropriate safety levels under threat of fines, potential imprisonment and loss of a license. There is nothing wrong with the EGASPIN guidelines in themselves, at least in terms of their 'target values' for clean up. Indeed some aspects of them may be too stringent to be practical, given that they demand action on oil spills within 24 hours, when from experience the oil operators may not apparently get to know that a spill has occurred within this period. Equally, the standards required of operators are largely in line with 'best practice' elsewhere in the world. The DPR, under EGASPIN are required to carry out regular environmental audits of oil installations as is also done elsewhere. In addition, there is a provision for 'appropriate compensation' to be paid in addition to the clean-up requirements.

However, there are several significant problems with EGASPIN. Good as they are in terms of regulation, one issue is whether they do in fact represent law, or are merely guidelines to behaviour, thus gaining their legitimacy from the FEPA Act. Secondly, it is obvious that had these guidelines been actively followed then the high levels of oil pollution found in the delta would not have occurred, at least in so far as it has been caused by equipment malfunction and identifiable operator error.

UNEP's study of Ogoniland recommended that the oversight of EGASPIN should be transferred to the Federal Ministry of the Environment and new staff recruited and trained. Others have suggested that even within the DPR expertise is lacking for the full implementation of these guidelines. However the main point against the continuing handling of the rules by the DPR probably lies not within the expertise available, but by the fact that the DPR remains part of the oil ministry. If a truly independent regulator was created, oversight could probably remain with it, for currently, the necessary expertise is not available within the environmental ministry.

UNEP also recommended that various parts of EGASPIN should be clarified, not least its distinction between 'target values' and 'intervention values' applied. The central point here is that the 'intervention values' laid out in EGASPIN are extremely high. For example, the intervention values of pollution of groundwater by such pollutants as benzene and toluene are roughly three times as high as the World Health guidelines. This distinction seems to suggest that EGASPIN remains purely available to guidance rather than having the force of law. In addition UNEP recommended that in a review of EGASPIN, more emphasis should be placed on the social and health impacts of oil spills and that the approach taken to clean up be clarified as should the rules in relation to decommissioning.

If there is to be a new independent regulator, its first task should perhaps be to review EGASPIN. The last such review occurred in 2002 and is thus a decade old. However, the central point remains the implementation of these existing rules and a clarification of their legal position. Certainly this current ambiguity does not suggest that whatever powers of the DPR to enforce them, they are actually being obeyed.

EXECUTIVE SUMMARY

As global regulation and pollution control of the oil industry has evolved over time, largely propelled by serious accidents, several strands of 'best practice' have become apparent. First and foremost, the control of industrial practice has shifted away from the revenue raising functions of the State. While taxation and royalty collection remains an important part of the State's interaction with oil and gas extraction, the risk that it could dominate how the industry is governed is now seen as too high, in that the State may allow the industry to cut corners on safety and environmental protection to maximize revenue.

Secondly, it has to be emphasized that regulation and emergency pollution control are different functions, although clearly related. Environmental and safety regulation is properly a State function. However only in the event of significant – tier 3 – pollution incidents – is the State necessarily the primary decision-maker in pollution control. Regulation is designed to avoid pollution incidents. Pollution control is designed to clear them up.

This follows a general trend, worldwide, in both functions. As the industry has evolved from its pioneering days, particularly as it moved offshore, States attempted initially to prescribe 'best practice' through specific regulation defining how the industry should operate in detail and the equipment required. This rapidly proved ineffective, economically inefficient and required State expertise that was not always available. It also limited innovation within the industry itself.

The result has been the development of a 'goal-setting' approach, where the State regulator is required to approve, not only specific approaches to individual developments, but also the environmental awareness and financial adequacy of the developing company itself.

In regulation, this has increasingly required a regulator's assessment of the fitness of the company to operate an oil field and also its personnel's awareness of both environmental and safety risks. The oil operator must convince the regulator of this. Secondly, the company must convince the regulator of its plans for any specific developments in detail. Only after approval of these plans can a license be granted. Furthermore, these plans must outline a complete list of the risks involved and a detailed strategy as to how any incident might be controlled and cleared up. The regulator can demand changes to these plans, prior to allowing any development and must continue to monitor the industry to insure that the operator follows them.

In effect, the onus is increasingly on the oil field operator to prove to the regulator that it is both aware of the environmental risks and is endeavoring to minimize them. It must also show clearly what it will do in the event of an incident. It is however, up to the State to provide facilities and plans for dealing with incidents that are sufficiently serious to go beyond any operator's capability. This in turn requires the existence of an agency to monitor all incidents, no matter how small, since these may escalate. Reporting of all incidents to this agency has become obligatory.

Both these operational programmes, spill data and emergency response plans are now generally available to the public on request. Such openness is a necessary part of the process of controlling the industry, since without it environmental activists may exaggerate the risks.

Finally, it is also up to the State to ensure that a full clean-up of any pollution is carried out by the polluting operator and regulate the degree to which this is required to be done. This links with the issue of compensation, which is examined elsewhere.

In Nigeria, prior to the Petroleum Industry Bill now going through the legislature, many of these issues have remained vague. As the Department of Petroleum Resources (DPR) currently controls the level of revenue from the industry and the licensing arrangements, the lack of distinction between revenue raising and environmental regulation and approval raises questions, not least in the relationship between the DPR and the National Nigerian Petroleum Corporation (NNPC).

It is also unclear in what detail the DPR requires operational plans for environmental controls to be developed prior to licensing, or how well they are monitored. This does not mean that such requirements are not in existence, but merely that they are not obviously available to the public.

Equally, there is a conflict in the responsibilities of the DPR and the National Oil Spill Detection and Response Agency (NOSDRA). NOSDRA appears to be responsible for monitoring all oil pollution and the process of detecting it and ensuring that it is cleared up. Both agencies appear to claim this role. As a regulator with licensing powers, the DPR has an obvious function here, while NOSDRA obviously cannot respond to emergencies if it hasn't the ability to monitor them.

Finally, in relation to its laws or guidelines to protect the environment, Nigeria has a fundamental conflict between agencies of the State. The Federal Environmental Protection Agency Act 1988 (FEPA), backed up by the Environmental Impact Assessment Act 1992 provides the basic rules administered by the Ministry of the Environment. However, the environmental guidelines dealing specifically with the oil industry, notably the Environmental Guidelines and Standards for the Petroleum Industry in Nigeria (EGASPIN) is a product of the DPR and thus the Ministry of the Petroleum.

While internationally, responsibilities for oil pollution are often the territory of either environmental ministries or energy ministries, most States have a clear distinction as to where those responsibilities actually lie.

ENVIRONMENTAL REGULATION OF THE OIL INDUSTRY GREW OUT OF DISASTER

It is important to note that state regulation of the oil industry did not begin out of a desire to protect the environment from pollution. While the first statute to outlaw the dumping of oil in Texas occurred as early as 1899, most early legislation, most notably by the individual states of the USA, was largely focused on settling disputes between drilling companies as to who had the right to drill in a particularly patch.

The solution was to develop a system of licensing and exploration blocks and, from this, the next logical step was for the state to demand a fee, followed rapidly by the introduction of royalties and taxation. Since then, oil has long been seen as a lucrative source of revenue for both local and national governments. As a result, oil has been inextricably bound up with raising money for governments.

This convenient relationship between oil and government revenue has been a major engine in the growth of the national economies across the globe. However the sheer extent of the increase in oil production that it created is not always realized. In 1958, when the first oil wells were drilled in Nigeria, global oil production was just over 18 million barrels a day (mbd). It is now over 90 mbd.

Statistically, this kind of growth has greatly increased the probability of large-scale accidents and damage to the environment. This statistical inevitability first manifested itself in the seaborne carriage of crude oil with the sinking of the *Torrey Canyon*, off the UK coast in 1967. The vessel at 120,000 deadweight tons (dwt) was very much larger than that the tankers that had operated in the early 1950s at around 16,600 dwt.

The largest tankers would, subsequently, increase in size to around 500,000 dwt, but the crucial aspect of this first significant oil-related maritime disaster was that governments realized that they had very little idea as to how to deal with the pollution, compensate for the damage or indeed get owners to take any responsibility for accidents. The result was the Civil Liability Convention of 1969, which put liability on owners regardless of proof of negligence and subsequently the 1973/78 International Convention on the Prevention of Pollution from Ships (MARPOL), which finally came into force in 1983.

The *Torrey Canyon* accident was subsequently reprised by the wreck of the *Amoco Cadiz* (233,690 dwt) off Brittany, France in 1978 and the *Exxon Valdez* (209,836 dwt) in Prince William Sound, Alaska in 1989. The point however is that the main driver for environmental regulation and liability regulation on the oil industry first started as a result of disaster and concerned activities on the sea.

This was perhaps predictable, because such disasters were highly visible. However, this greater search for suitable state control over the environmental impact of the oil industry, also coincided with the movement of oil production deeper offshore in the North Sea, the Gulf of Mexico and off Brazil in particular. Just as with the development of legislation for control of the tanker business, regulation of offshore production was driven by disaster where incompetence and disregard for either safety or the environment was fully revealed.

The first disaster to have an effect on regulation was the capsizing of the *Alexander Keilland* in Norwegian waters of the North Sea in 1980. This was a semi-submersible accommodation rig in the North Sea that turned over when one of six bracings between the legs snapped. The rig heeled over to 30 degrees, held by the one remaining anchor chain, when the other six had snapped. The rig remained above water for 23 minutes, during which time it should have been possible to rescue those on board. However of the 212 on the rig, 123 were drowned.

The standby vessel took an hour to get to the scene, four life-boats were launched, but only one was released from its cabling. A fifth life-boat turned over, although it was subsequently righted. Of the 20 life rafts only two were launched. The impact for the regulator was that in future, operators had to prove that they had, at minimum, a proper chain of command in emergencies.

Enchova Central, a production platform off Brazil, suffered a tight gas blow-out, to which the Campos Basin is particularly prone, in 1984. Forty-two personnel were killed, 36 of them because a life boat chain failed to detached and left the occupants hanging vertically, until it snapped, killing them on impact with the water. While not widely noted by the public outside Brazil, inside the

oil industry, the incident once again reinforced the lesson that the industry – in this case operator Petrobras – needed to reappraise its safety. The extent of the hazards was reinforced by a second explosion in 1988. Fortunately this time, a floating hotel was next to the platform and the personnel got off, but the platform was completely destroyed.

Perhaps the most revealing accident regarding attitudes to safety in the industry was revealed in 1988, when Piper Alpha, a production platform, caught fire and was totally destroyed. The accident was a terrifying own-goal. First, one of two, condensate pumps was under repair, but nobody told the incoming shift. The power supply was thus dependent on this one pump, which suddenly failed. With only a few minutes to keep the electricity on, the manager switched on the other pump, not having been told that it was under maintenance.

Condensate and gas leaked out at high pressure and exploded. The blast blew down the firewall, forcing abandonment of the control room. No evacuation was ordered. Fire prevented personnel from getting to their life-boat stations. Astonishingly, the fire might have burnt itself out, but oil and gas continued to flow from the nearby Tartan and Claymore platforms. Their operators continued to pump this gas to Piper Alpha in spite of the fact that they could see the platform in flames, because of the cost of a shutdown and also because they had no orders to stop.

Even if they had switched off, the gas lines were 146 diameter lines at 120 atmospheres pressure and would have still emptied onto the platform. One of these lines was 30 miles long. They emptied into Piper Alpha, releasing 115-130 tonnes of natural gas per second. Both gas pipelines eventually ruptured and exploded. The fire-fighting vessel *Tharos* was simply not up to task. Of the 224 people on board only 59 survived, largely through jumping 60 metres into the sea. The subsequent extensive inquiry revealed a catalogue of elementary errors by management that exposed a chronic incompetence and a climate of fear amongst the workforce, both on Piper Alpha and other parts of the offshore North Sea.

All three of these major accidents offshore revealed major questions about the competence of the oil industry, largely in relation to the safety of their operations. If none of them produced widespread environmental pollution, they did light up the practices of an industry that was notoriously secretive. Indeed one of the unexpected consequences of the Piper Alpha tragedy was that trade unions were not only allowed offshore for the first time, but also positively encouraged to recruit as part of the new safety regime. Equally, if the industry was so cavalier with the lives of its workforce, it might well be as cavalier regarding the potential for widespread oil pollution.

This came in 2009 and subsequently in 2010. The Montara spill in 2009 was another blow out, 690 kms west of Australia's Darwin in the Timor Sea. This time everybody was safely evacuated, but the platform continued to pump oil into the sea at the rate of 2,000 bd for 74 days, until a relief well was drilled, after some five attempts to plug the well. The amount of oil spilt was disputed and a Commission of Enquiry made some 105 recommendations to improve industry practice, most of which were accepted. The company concerned, PTTEP Australia admitted deficiencies in its practices. Significantly, the Australian Federal Government suspended the normal well drilling approvals for the relief well to allow the company to get on with the job. Given the position of the leaking well, the government of Indonesia demanded compensation.

Yet if Montara was serious, Macondo in 2010 became the biggest oil spill in history. On the Deepwater Horizon drilling rig, high-pressure gas expanded into the drilling riser and exploded and 11 of the crew were killed, although most got off by life-boat or were airlifted out. However the explosion had also damaged the sub-sea well-head, which leaked oil from water depths of 5,000 feet. Two containment systems were used to try and stop the leaks, but these were finally only stopped by a relief well, three months after the initial explosion.

A great deal of the problems associated with Macondo related to the sheer depth of water, sending out a warning about such wells and requiring new techniques to stop the spill. The flow of oil went on for three months, producing an estimated loss of 49 million barrels into the Gulf of Mexico. The spill cost BP over \$30 billion in costs and compensation to those affected by the pollution.

All these offshore accidents produced major changes in the regulation of the industry relating both to safety in the industry and its impact on the environment, which are examined below. However the question needs to be asked as to why onshore oil production disasters have not had a similar impact on the regulation of the industry in a similar fashion?

The short answer is that the very largest of known major onshore spills have been the result of military action. By far the largest of these burned and spilled in Kuwait during the First Gulf War from January to November 1991. Clearly no amount of regulation would have affected these. One major spill did occur at Mingbulak in Uzbekistan's Fergana Valley, which produced perhaps 2 million barrels in 1992, most of it captured locally by dykes. Perhaps America's largest known oil spill on land occurred in 1909. The Lakeview Gusher in Kern County California produced around 9 million barrels, but the technology was not available to stop it and it was seen locally as a phenomenon, rather than an environmental threat.

Knowledge of oil spills from pipelines largely relates to the openness of the society concerned and are, by comparison with the offshore spills, largely small and partly recovered. The Prudhoe Bay pipeline in Alaska ruptured in 2006, losing 6,400 barrels, while the Canadian Enbridge line has been accused of 804 individual spills between 1999 and 2006, the largest being around 6,000 barrels. Greenpeace has suggested that the Russian oil pipeline system had around 14,134 individual spills in 2010 alone, although details of the volumes lost or recovered are unknown. In Western European pipelines, where analysis is very detailed, spills are extremely rare. In effect, although large when accumulated, pipeline spills do not generate major changes in the way the State regulates the industry.

Oil pollution from mainstream refineries, while considerable and invariably the result of fire and explosion leading to detailed investigation and allocation of liability, are not immediately relevant here.

By comparison with spectacular offshore spills and pollution, onshore spills are thus incremental in impact. This is Nigeria's problem. While the full extent of onshore oil pollution spills over time in the Niger Delta may well be in excess of any of the major spills that have changed the international regulatory regimes including Macondo, their individual impact has been much smaller. In addition, the earliest pollution of the Delta occurred in an era where such pollution was not generally on the political agenda, nor seen as particularly important.

THE SEPARATION OF REVENUE-RAISING FROM REGULATION

As 'best practice' in regulation has evolved over the past thirty years, a key component has been the slow removal of the regulatory authority from the process of maximizing oil revenues to government. When this does not happen, regulation of both national oil corporations and the international oil industry tends to break down. A good example is Mexico's oil sector.

Prior to capsizing of the Alexander Keilland, there had in fact been another offshore oil disaster that starkly illustrated the first principle of regulation but produced no changes to the international regime. In June 1979, a semi-submersible rig the Mexican part of the Gulf of Mexico hit a blow-out on the well Ixtoc I. While there were no casualties, the well took 294 days to cap, pumping an estimated 3 million barrels into the sea. The rig was totally destroyed.

In spite of paying out \$100 million in clean-up costs, Pemex, the national Mexican oil company simply proclaimed sovereign immunity as a state corporation and paid out no further compensation in spite of the extent of the damage, which reached well into US waters. Indeed, Pemex was and remains such a significant part of the Mexican state, accounting for as much as 40% of its revenue, that the Mexican Government did not set up a proper regulatory body – the National Hydrocarbons Commission (NHC) – until 2009, thirty years after its first major oil spill.

The Pemex example illustrates the problems of separating the State's need for revenue and its regulation of the oil industry. This is always complicated by the existence, as in Nigeria, of a national petroleum corporation. In Mexico, where the Minister for Energy is also the chairman of Pemex, the corporation has been widely criticised for decades regarding thefts of oil, unnecessary expenditure and failure to employ good recovery techniques.

However, it was falling oil production and thus revenue, rather than safety or environmental issues that prompted the formation of the independent NHC. While this organisation has no direct legal powers of enforcement, it is forced to use public opinion to try to make the company to pay much more attention to potential risks, particularly as it moves into deeper water. The Mexican regulatory regime thus remains largely unreformed and under severe criticism from other national regulators.

By contrast, international 'best practice' experience clearly suggests that a separation between the regulators of the industry and anything to do with revenue raising from oil is fundamental. As national oil companies are part of this revenue-raising process, this also requires a similar distance between them and the national regulator. This is necessary because the regulators must have powers to deny or take away a drilling license to enforce rules about health, safety and environmental good practice, inevitably reducing state revenue. Without the ability to take such action when rules are broken, the regulators become powerless to enforce good practice

Furthermore if the regulators, or indeed the ministry, are dependent on oil for revenue in any way, situations may arise where the regulator itself may be reluctant to enforce 'best practice' because enforcement may reduce its own income. This creates a disincentive for the regulators to take any necessary action, if operators break the rules. Enforcing best practice may well require that operators suspend production. If the regulators are dependent on that production for fee revenue, they may well become insufficiently alert to any careless activity on the part of operators, or indeed turn a blind eye to it.

It is not the task of an independent regulator to increase production, but rather to make sure that that production is carried out safely and without damage to the environment. It must be capable of both fining companies and suspending their operations. Without such powers, it is also, in effect, toothless. While in most circumstances such powers may not be required, good regulation necessarily requires them.

Where regulating agencies have previously been drawn into the process of encouraging production for revenue reasons, accidents have frequently followed. In the 1980s, in the United Kingdom, the Department of Energy (DEn) was charged principally with the encouragement of North Sea oil development, but it was also charged with developing a health and safety regime and environmental best practice. However such was the desire of then government to expand production, that the operators were more or less left to pursue their own devices. As noted, the result was Piper Alpha disaster and the deaths of 167 oil workers resulting from a catalogue of human error.

The subsequent Cullen Inquiry made 106 recommendations, but by far the most important was the decision to remove the regulation of safety from the DEn to an independent specialist regulator, the Health and Safety Executive. It was thought that the DEn had a conflict of interest regarding its procedures, since it was the agency of government most associated with encouraging oil production.

Much the same thing happened in Australia, after the Montara spill. At the time, environmental regulation was largely handled by state governments or the Designated Authorities (DAs), who were also responsible for licensing and thus also raised revenue from oil production. The post-accident inquiry revealed that the DA responsible was receiving more from fees than it was spending on regulation. It was *“concerned that there are conflicts of interest in the current arrangements whereby the DA is responsible for both resource maximization and industry development as well as for the regulation of well integrity”*.

Again, the subsequent inquiry demanded a separation of these functions and a new Federal Government independent regulator was set up. This was the National Offshore Petroleum Safety and Environmental Agency (NOPSEMA), which replaced the previously responsible agency of the Northern Territories State Government.

Such was the impact of the Deepwater Horizon disaster, that the US Government reorganized its offshore oil regime. The regulator, the Minerals Management Service of the Department of the Interior, was deemed inadequate, because the same body was responsible for royalty collection, worth \$13 billion a year or 95% of all the Department's revenue raising. Once again, the revenue raising aspect of oil production was separated off, and the responsibility for offshore safety, inspections and environmental management given to a new organization, the Bureau of Safety and Environmental Enforcement.

Brazil's Petrobras has had a similar problem to Mexico. Its regulator, the National Petroleum Agency (ANC) has been widely criticized as being too close to Petrobras, the national oil company, but has recently started to be more aggressive, particularly following the Macondo spill. Because of a spill in Chevron's Frade field, it stopped the operator continuing to drill, much to the company's surprise. Nonetheless, this action is seen by skeptics of its independence to be the result of a fear that a Brazil might have a deepwater accident like Macondo.

Overall, to be truly independent, the regulator should be separated from any suggestion that it has an interest in maximizing oil production because it receives its revenue from it. Failure to establish this leads to a widespread belief that the regulator has other priorities than safety and environmental protection and is thus too close to the industry to be effective.

FROM 'PRESCRIPTION' TO 'GOAL-SETTING' IN REGULATION

Distinction has to be made between regulating the oil industry to maximize safety and minimize environmental damage and the role of the state when things go wrong. While the regulator will have a major role in establishing what went wrong and defining the liabilities of the oil operator, it is not generally the function of the regulator to provide emergency response in the event of accidents. Rather it is its role to make sure that the oil company concerned has the capacity to provide such a response.

Making sure that operators can deal with crisis is a major part of the evolution of environmental and safety regulation from 'prescription' to 'goal-setting'. An examination of the way 'emergency response' is organized will be dealt with later. However, the most important aspect of the way international regulation has changed over the years is how regulators have shifted away from trying to insist on particular equipment and practices by law and moved the responsibility for safe practice onto the operators themselves.

This shift towards setting goals, rather than demanding specific 'tick-box' lists of types of equipment and activities was at least the result of confusion as to who should take overall responsibility. When the Alexander Kielland capsized, the Norwegian regulatory regime was widely spread out between agencies. Because the rig was a mobile unit, it was the responsibility of the Norwegian Maritime Directorate since was effectively regarded as a ship. The Norwegian Petroleum Directorate (NPD) was merely responsible for the living conditions of the men on board. Several other agencies also claimed jurisdiction in different areas.

The key issue with the Kielland was probability versus consequence. The probability that a semi-submersible could simply turn over was very low. However the consequence following from it was very large. The process of checking a detailed variety of specifications made no attempt at risk assessment that calculated this balance. Equally no amount of setting specifications by the State could allow for the sudden collapse of a leg bracing, largely the result of faulty welding when the rig was built in France, years earlier. Crucially, if the structure had been approved – in detail – by government inspectors, then the government was just as liable for the accident as the company.

The response of the Norwegian Government was firstly to centralize the regulation of oil production on a single agency, the NPD. The Kielland might have been movable and had no production facilities, but many of the other structures in the North Sea were fixed platforms for oil production. These were definitely not ships. Secondly, the shift in regulator allowed the NPD to throw out a wide variety of checklists and change the philosophy of regulation.

The first priority was to fix responsibility where it belonged, namely with the operator of the installation, not the state. To do this, the NPD demanded that operators develop internal control systems that calculated both probability and risk. Initial attempts to get the companies to reveal their internal control regimes were revealing in so far as they were frequently reluctant to disclose them. The NPD also insisted that the trade unions involved be brought into the process of compiling such management systems.

The key here was the NPD effectively demanded that the 'goal' was safe operation and the avoidance of accidents. It was up to the companies to develop such system and up to the NPD to approve them. In this regard, the Norwegians were the first to develop this approach. For the first time, the regulator gave 'consent' to developments, rather than 'approval'.

To further distance the regulator from the process of oil development, the NPD's responsibilities for safety and environmental protection were transferred to the Norwegian Petroleum Safety Authority (PSA) in 2004.

The existing British system of regulation by the Department of Energy (DEn) was not only found to be inadequate like that of Norway, but positively disastrous. Indeed the industry was so shocked by what happened on Piper Alpha that it spent over £1 billion before any official inquiries reported. It carried out immediate assessments of all offshore installations and management systems. It relocated emergency shut down and pipeline isolation systems, instituted smoke hazard mitigation, improved evacuations procedures and began formal safety assessments.

In one of the longest official enquiries in British history into the disaster, the Cullen Enquiry made 106 recommendations regarding offshore procedures, all of which were accepted by the industry. The key finding was to take away the control of safety from the DEn and place it with a new offshore specialist unit of the independent Health and Safety Executive (HSE).

Several factors drove the regulatory regime away from prescription towards goal setting. First and foremost, the Enquiry revealed that existing 'permit to work' systems and safety audits on the installations were designed to comply with procedural rules, rather than ensuring safety. The second revealed that, unlike the Kielland capsized, where a single unlikely event caused the disaster, Piper Alpha involved a catastrophic chain of events that arose from a single quite probable event; the failure to report routine maintenance on a single pump. Clearly no tick-box system of prescription could possibly have covered such a set of circumstances.

The shift towards regulation by the HSE reinforced the change to a goal-setting philosophy because this was the prevailing orthodoxy at the HSE at the time. Set up in 1971, this agency was responsible for safety in factories, building sites, leisure facilities and offices throughout the UK. Clearly the agency could not have expertise to cover all of its responsibilities in technical detail. It was thus up to those involved to prove to the agency that they were operating as safely as was reasonably possible. The philosophy of goal setting was more important than the Agency's expertise.

By the time of the Montara blowout in 2009, most developed country regulation was following some kind of 'goal-setting' agenda. However there was clearly room for improvement. Following the accident, the operator, the Australian subsidiary of the Thai national oil company, PTTEP, largely admitted that it had not followed 'sensible oil field practice' and was fined \$510,000.

Nonetheless, an inquiry made a number of recommendations relating to improving regulation. In a bow to environmental pressure, the federal regulator ceased to be the National Offshore Petroleum Safety Authority (NOPSA) and became the National Offshore Petroleum Safety and Environmental Agency (NOPSEMA).

This was to replace the regulatory functions of the state governments about which the inquiry was scathing, noting that it was little more than a 'flick and tick' exercise. There was little wrong with the fundamental legislation. What was inadequate was its implementation. For a start, the regulator should not simply assume that the operator was telling it everything, but should ask searching questions:

"In the future, and in the interests of ensuring that all possible well control options are comprehensively pursued to exhaustion, decisions as to well control response options should be the result of collaboration between the regulator and the operator rather than leaving one party to make unilateral judgments as to the appropriateness of various well control operations. The regulator should provide transparent and contemporaneous explanations to the public of all well control options under consideration at any particular time."

Australian regulators needed more powers to suspend production licenses, even when it is just an inspector's view that a fatality may take place. A civil penalty needed to be introduced for failures, while the operator should provide details of the availability of other rigs to drill relief wells if a blowout occurred, prior to beginning to drill. However the onus was not all put on the operator. It was up to the regulating agency to develop a much closer relationship of guidance and liaison with operators on a continuous basis.

If the Australians had largely followed the UK in the process of 'goal-setting' in preference to prescription – indeed the Montara Inquiry cited the Cullen Enquiry – it did want to increase one area of 'prescription' notably on well integrity. Minimum standards were necessary. This might have been valuable in the next disaster; Macondo.

The Macondo/ Deepwater Horizon explosion and oil spill sent a shudder through oil industry regulators worldwide. While the responsibility for the accident was firmly placed on the operator BP, what was also significant was that accident revealed how little notice the US regulator had taken of regulatory changes elsewhere. Blaming BP was entirely within the 'goal-setting' philosophy of 'best practice' regulation. However US regulation prior to the accident was more 'tick-box' and prescriptive than most found elsewhere. To emphasize that the State really was in control, President Obama ordered a six-month suspension of all deepwater drilling.

The existing regulator, the US Minerals Management Service (MMS) of the US Department of the Interior, was understaffed and under-funded. Its responsibilities not only included offshore safety enforcement, but also leasing, revenue and energy management. The agency was delegated to manage, regulate the leasing, exploration, development and production of resources on the Outer Continental Shelf (OCS).

Leaseholders received permits to operate in compliance with regulations to protect persons, property and the environment on the OCS and also allow access to its site of operations to inspectors and provide documents and records regarding safety and environmental protection. MMS was responsible for enforcing regulations governing drilling operations. These were contained in a very large collection of documents, known as 30 CFR Part 250. Its requirements were outlined in a whole series of individual sub-sections.

The extensive nature of the prescriptive requirements of the regime can be gathered by the fact that 30 CFR Part 250 had 1929 individual sections, each of which contained a large number of questions. Subpart D of this, for example, covered many aspects of drilling operations, including permitting, casing requirements, cementing requirements, diverter systems, BOP systems, drilling fluids requirements, equipment testing, and reporting.

30 CFR part 250-415 had eight individual questionnaires on casing and cementing wells. Hardly surprising then that the agency was accused of allowing industry personnel to fill the forms in pencil and then inking them in. Equally, concern had been raised as early as 2008, that the flow of regulators from the MMS into industrial positions and back again had led to accusations of corruption and favours.

To drill a well, operators had to fill in the relevant parts of 30 CFR 250, submit an exploration or production plan, meet oil spill financial obligations, produce an application to permit to drill (APD) ticking all the necessary boxes, fill in a variety of other forms known at MMS-123 and pay a service fee. Given that BP's APD for Macondo was over 100 pages long, it was not a surprise that MSS Inspector Frank Patton failed to notice that BP had failed to submit supporting documentation to show that *“the blind shear ram in the BOP stack had the ability to shear the drill pipe under maximum anticipated surface pressure as in 30 CFR 250-416 (e)”*

The MMS inspectorate did have the capacity to issue non-compliance notices, threaten civil penalties and carry out visual inspections, but the overall impression is that they were required to tick so many boxes that they were lost in the paperwork. What was apparently missed was the corporate culture of BP in the Gulf of Mexico, which was subsequently blamed for the accident. The administration's initial response was to remove the revenue raising aspects of MMS into another part of the Department of the Interior and transform the rest into the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE). In October 2011, this was split into two: The Bureau of Ocean Management (BOEM) and the Bureau of Safety and Environmental Enforcement (BSEE).

While both had an environmental role, in that decisions on leases made by BOEM had to take into account wider aspects of environmental protection, it was BSEE that took on the major role of regulator. While the putting in place of a number of notices to lessees (NTLs) and a new 'Drilling Safety Rule' made the new BSEE look like it was still using a prescriptive method, in fact it was moving rapidly away from it towards goal-setting.

The new Drilling Safety Rule, for example, was the product of a major consultation with the industry which went systematically through 30 CFR 250's numerous provisions, knocking out dead wood and clarifying a variety of issues. From now on, BSEE not only demanded plans for how any future deep water spill would be dealt with, but also demanded that the companies produce evidence that they had the necessary equipment and resources.

Furthermore 44 of new inspectors were recruited to enable multi-person inspections to replace a single inspector's visual oversight. Training for the inspectorate was provided by a new National Offshore Training and Learning Center.

Furthermore, companies in future were required to introduce Safety and Environmental Management Systems (**SEMS**) in collaboration with BSEE. These would examine the potential for human error, looking for continuous improvement and performance-based operating practices. Both industry and the regulator were to pursue their collaboration to improve safety and environmental protection together.

HOW GOAL-SETTING WORKS IN PRACTICE

It may seem counter-intuitive that governments should provide less specific rules about how oil companies should operate and offer greater collaboration in pursuit of the specific goals of safety and better environmental protection. However, creating a series of very detailed instructions can actually damage the regulator. If something goes wrong that has been authorized, then the operator can actually blame the regulator. In effect, the regulator starts taking risk away from the operator. It starts taking on the liability, if anything goes wrong.

Equally, if a new technology cannot be deployed until the rules are all changed, innovation will be stifled. As Macondo and various accidents have made clear, ticking boxes from a long list of things to check is not adequate to the issues. If the potential problems of technology were obvious, then the operator would put them right anyway.

The key to safe operating lies in the personnel and practices of the operator and not just in the technology. As noted, the US has, post-Macondo, made it obligatory for companies to develop a Safety and Environment Management System (SEMS), which includes employee training. Inspectors have to see that not only is this in place, but that its procedures are closely followed. The operators are in the best position to know what they are doing. It is up to the regulator to make sure that they do what they say they are doing.

The problem with a great deal of detailed legislation on environmental pollution is that it can take the regulator's eye off the ball. It involves a great deal of fact checking that may disguise the overall 'feel' of operations. Equally, if the operator has innovative ideas, these have to go through a long legal process by the regulator to allow such new ideas.

Safe operating is best promoted if there is a feeling of mutual respect between operator and regulator. The operator is the first mover and has the requirement to prove to the regulator that what is proposed is acceptable, not the other way around. It is also the responsibility of the regulator to see that the operator actually keeps to the plan proposed.

While the regulator clearly has powers of enforcement and prosecution, in fact, enforcement orders are comparatively rare in most well regulated parts of the world. Changes in plans or during inspection of facilities are more often like friendly advice.

The regulator is however the one that gives the final permission to operate and has the capacity to shut down the facility. This often causes arguments from NGOs and the press that the regulator has been 'captured' by the industry because it does not take aggressive action. This is a danger if the regulator gets slack, but goes against the general trend away from prescription. There has to be collaboration between the regulator and the industry and the relationship should not be antagonistic, even though the regulator has the power.

The first stage of this relationship is that the future operator must be capable of finding and producing oil safely and with regard to environment. Obviously financial capacity is important, here. Oil companies have been known to run out of money while exploring or developing fields. However, a company must also show that it is either insured or has enough money in reserve to cleanup and to compensate, if there is a pollution incident.

Ironically, no regulator would have stopped BP from drilling Macondo on the grounds that it did not have enough money to finish it, but fortunately as a major multinational, it had enough money, without insurance to provide both cleanup costs and compensation. However, some of the smaller oil companies may not have this capacity and is the job of the regulator to establish if they have.

Past experience here is also important. In the UK, the Department of Energy and Climate Change (DECC) has a general rule that companies are much more likely to get licenses if they can show that they have practical experience of the North Sea. Part of the process of licensing has to be an examination of a company's past track record.

Operators have to show that they have an environmental emergency response capability throughout the company, ready to take action in the event of a crisis. As noted, in the US, this is known as the Safety and Environment Management System and was introduced across the board after Macondo. It includes proof that the operator regularly undertakes emergency response exercises. It also now includes the company's provisions for employee training, which is now a fundamental part of the process of getting a license at all.

This is because the workforce are the eyes and ears of the company on the ground. It is significant that virtually every major oil disaster has been caused in some way or other by human error. In Piper Alpha, it was a basic and minor initial failure to follow procedure and a fear of management. Significantly, the disaster allowed a unionized workforce to move offshore for the first time. Unions had previously been banned. The Norwegians and the British regulators believe that Macondo reflected a lack of respect for the workforce in the USA. A recent trend in some regimes is to create a 'whistleblowers charter' giving the workforce the right to refuse to do something that they feel is dangerous, without consultation.

It is 'systems' or holistic approach. Safe routines have to be established and constantly re-emphasized, even if this seems tedious. In effect, the attitude of the workforce is a key indicator of whether a plant is well managed. It is the job of the regulator's inspectorate to judge this, not merely for a single installation, but for the company as a whole. A part of this will be the attitude of the company to training. Chevron issues a 'Stop work authority card' to its employees on offshore installations which states: Not only do you have a duty, but you have a responsibility if you see anything wrong, to stop work.

Obviously, the basic processes have to be established. However, within the oil and gas industry those processes are pretty much understood. What makes the difference between safe operating and accidents is the exact following of established procedures and the workforce and training is a key element in this.

SPECIFIC INSTALLATIONS

This approach continues when it comes to specific installations. In the case of the US SEMS program, before any operation is carried out the plans must include:

- Safety and environmental information: safety and environmental information needed for any facility, e.g. design data; facility process such as flow diagrams; mechanical components such as piping and instrument diagrams; etc
- Hazards analysis: a facility-level risk assessment
- Management of change: program for addressing any facility or operational changes including management changes, shift changes, contractor changes, etc
- Operating procedures: evaluation of operations and written procedures
- Safe work practices: manuals, standards, rules of conduct, etc
- Training: safe work practices, technical training – includes contractors
- Mechanical integrity: preventive maintenance programs, quality control
- Pre-startup review: review of all systems
- Emergency response and control: emergency evacuation plans, oil spill contingency plans, etc.; in place and validated by drills
- Investigation of Incidents: procedures for investigating incidents, corrective action and follow-up
- A safety and environmental audit had to be carried out every three years after an initial two-year evaluation
- Records and documentation: documentation required that describes all elements of the SEMS program

Before drilling, according to the new Drilling Safety Rule operators had to provide:

- Description and classification of well-control barriers
- Define testing requirements for cement
- Clarify requirements for the installation of dual mechanical barriers
- Provide requirements for BOPs and well-control fluids to well completions, workovers, and decommissioning operations

In the UK system, much that is required under the US SEMS program is contained within an Environment Management System (EMS) for operators in general and an Oil Pollution Emergency Plan (OPEP) for specific installations. This has to be approved by the regulator prior to any development. Indeed until it is approved regulatory consent is withheld, while the regulator can order alterations to it.

OPEP's are now actually part of the process of design and construction and are collaborative documents between the company and the regulator. They can take over a year to be approved and be well over 100 pages long. The design may have to be changed, if the OPEP is unsatisfactory.

An OPEP will provide all the details about the planned facility including the exact position of all its wells and its mobile units for drilling plus an estimates 'worst case relief well' time required to kill any blow-out. Pipelines are also listed, including those not the responsibility of the operator.

The OPEP also includes a great deal of environmental information about the site of the facility. This will include details of wind speeds during the year and the local tidal currents. Patterns of seabirds, fishing resources and plankton populations may also noted. Seabed features and sediments will be included to ensure the safety of the platform's foundations. Much of this relates to the type of oil produced. For example, if the platform is producing just condensate or gas, then clearly the operator can explain that it "*is unlikely that oiling of animal pelts/plumage will be significant*".

A detailed analysis of the mathematical probabilities of failure will also be included, such as "*Development Well: Greatest Volume or flow at 2640.4 cubic metres/day and likelihood of blowout less than 10 to the minus 4*".

The OPEP must include a plan for a response to an oil spill, charting out who is responsible for what must be done. All those first seeing a spill are to report it immediately to the control room. Then the designated person in charge of environment and safety will go through a checklist of obligatory actions. These include estimating the size of the slick, and where it is going and notifying the operator and for spills over 1 tonne, DECC and coast guard. A detail log has to be kept of the incident with timings of each action.

The plan has to include details of type of oil likely to be spilled and thus its probable behaviour when spilt in relation to various conditions such as wind speed and release rates. This will include the time it is likely to take to reach the beach or the median line with another country. This will be outlined in the OPEP in several different scenarios, with details of potential use of dispersants and their effects.

The OPEP must include a plan for a response to an oil spill, charting out those responsible for what must be done. All those first seeing a spill are to report it immediately to the control room. Then the designation person in charge of environment and safety goes through a checklist of obligatory actions. These include estimating the size of the slick, and where it is going and notifying the operator and for spills over 1 tonne, DECC and coast guard. A detail log has to be kept of the incident with timings of each action.

The legal requirement to report all oil and chemical spills to the regulator is mandatory.

All OPEP's have a detailed flow chart, including names and numbers of who to contact in the event of a spill. This is mandatory and must be kept up to date, so that facility operators know exactly who to contact and when. Obviously this includes the operator's own management but so is a list of 'mandatory stakeholders' including the necessary government agencies. In the UK this is now automatic at the press of a button. The reporting system applies to all tiers of oil spill, even when it is easily cleared up by the operator alone and will not involve these government agencies.

As with the US Drilling Safety Rule and SEMS, the OPEP will show that a detailed Blow-out Contingency Plan is in place. This will have a chronological sequence of the actions to be taken and estimates for the time needed. In the event of a blow-out for example it may take a few days to get the necessary equipment, fire control, well-head access, BOP removal and so on. The company must have a strategy and tell DECC what it is. DECC will then say whether it is adequate.

The OPEP combines a number of important things. It is a full explanation as to what the company plans, where it is and what it is. It clearly requires a lot of work. It requires examination of the seabed, wild life, estimates of risk, calculations of distances. Some of its data may have to be verified by a classification society. It is also a distinct operational plan for what to do if anything goes wrong.

What is extremely valuable from the point of view of the regulator is that it provides DECC with full information, which the companies are forced to provide and pay for themselves. Equally however, if DECC does not like it, it can force the operator to change it.

As experience has grown up, OPEP preparation has got easier as both operators and the regulator have grown in experience. Operators can also learn from each other.

Obviously OPEP vary considerably, not least because of the type of fuel is being produced. Heavy oil production far offshore, in relatively deep water, will require a great deal more information than an inshore gas-condensate field in the shallow southern North Sea.

The OPEP is also a very useful device for both companies and the government in relation to handling any crisis. Government press officers can refer to it, not only for basic details, but also as an explanation as to what the response is likely to be. If necessary, it can be released for public examination.

Norway's regulatory system is remarkably similar in both intention and capability. The regulatory framework of the Petroleum Safety Authority has five regulatory sections giving first a framework requirement, then dealing with management, activities, installations and technologies.

If this appears heavily prescriptive, the total amounts to only 108 pages, with a similar number of guidelines. The emphasis is on co-operation and consultation. Indeed a great many of the guidelines referred to are those provided by the Norwegian Oil Industry Association and thus the industry itself.

INSPECTION AND ENFORCEMENT

While the process of 'best practice' in regulation is becoming more collaborative, the regulator has to have the ability to inspect and to enforce its recommendations.

In the UK, this function is split. The HSE has responsibility for safety, while the DECC's Offshore Environmental Inspectorate (OEI) takes the environmental role. Both are responsible for vetting OPEPs as well as EMS. It is their decision to allow a development to go ahead. They have considerable powers to question management and workforce and both take records as to incidents, concerning fatalities and injuries in the case of the HSE and spill incidents in case of OEI.

Both Agencies have the right to inspect installations and can demand that the operator furnish access to them. The HSE is currently running a campaign – KP4 – to examine the impact of some platforms reaching beyond their design life and can make as many as 60 individual inspections in a year. The agency currently has 105 employees. Meanwhile the OEI make over 50 inspections a year, and have 23 inspectors. In an average year, they will carry out some 60-odd investigations, write between 38-65 enforcement letters and examine some 300 oil spill reports.

The frequency of inspections relates to a number of factors; age of the platform, potential impact of a spill, incidents reported and non-compliance notices. In effect, the more you spill, the more likely you are to be inspected. The size of the installation may also have a considerable bearing on the number of inspections.

For the much larger area of the US part of the Gulf of Mexico, the US BSEE has 55 inspectors based in New Orleans. It makes many thousands of inspections a year, dividing up these according to categories relating to exploration, production, workover wells, metering, abandonment, pipelines and environmental compliance.

A list of Potential Incidence of Non-compliance (PINC) provides guidelines as to what the inspectors are looking for. The inspections are both regular annual ones and others that are unannounced. They follow a pattern, similar to the British, in that the age of the structure, its size or previous breaches of the rules influence the level of inspection.

In general the process of enforcement is similar for most regulators. In keeping with the idea of collaboration, operators are given a chance to put things right. In the case of the US, *"if an operator is found in violation of a safety or environmental requirement, a citation is issued requiring that it be fixed within 14 days. The violation may call for the particular well component, production component, or the entire complex to be shut in."* A notice of an Incidence of Noncompliance (INC) is issued.

If this is ignored, the penalties escalate. These can lead first to a suspension of operations, until the fault is remedied, followed by a cancellation of the lease. In the case of severe violations, civil penalties are invoked and if the fault is 'knowing and willful' the BSEE can send the matter to the Department of Justice for criminal penalties to be assessed. Since the introduction of the new system, reported incidents of all kinds have fallen from over 800, to less than 600 a year.

Both the HSE and the OIE have similar powers, although in the case of the OIE starting off with a letter and discussion of the issues concerned, but potentially leading to enforcement notices, prohibition notices, revocations of a license to drill and even prosecution of individuals. However in the vast majority of cases, the argument is settled without any legal action. HSE has a similar structure of responses, leading potentially to prosecution. The agency now has the right to recoup its costs of enforcement from the operator.

Within Europe, the overall guidance for the regulators lies in the Convention for the Protection of the North East Atlantic (OSPAR). Signed by 15 countries, this was originally created to deal with tanker accidents but has now been extended to oil installations. Primarily concern with charting issues of environmental concern in the area, including plotting biodiversity, it has its own Offshore Industry Committee, which lays down specific rules on matters such as abandonment of oil installations.

Globally, to exchange best practice processes in regulation, regulators from 10 states have formed the International Regulator's Forum (IRF). The members currently are:

- National Offshore Petroleum Safety and Environmental Management Authority, Australia (NOPSEMA)
- Petroleum Safety Authority, Norway, (PSA)
- US Bureau of Safety and Environmental Enforcement (BSEE)
- Danish Energy Agency (DEA)
- National Hydrocarbons Commission, Mexico (CNH)
- New Zealand Department of Labor, (DOL)
- Canada-Newfoundland and Labrador Offshore Petroleum Board, (C-NLOPB) and Canada-Nova Scotia Offshore Petroleum Board, (CNSOPB)
- Brazilian National Petroleum Agency, (ANP)
- The Health and Safety Executive, Great Britain, (HSE)
- State Supervision of Mines, the Netherlands, (SSM)

Their aim is to promote best practice on the grounds that this also produces the best economic performance. The IRF exchanges information with regular meetings to examine trends, lessons from incidents and the effectiveness of their own regulation. The Forum also sets up specialist working groups, when the need arises.

The Forum recognizes that requiring similar regulations and processes internationally also has a value in itself. The industry is multinational and the same companies operate all over the world. If rules are similar and so are the mechanisms of regulation and penalties, the industry can more easily understand what is required and best practice can spread worldwide.

Overall, the shift towards goal setting amongst regulators has moved the climate in the oil industry towards greater collaboration and openness. This, by avoiding prescriptive and detailed rules, avoids problems of potential government liability, sustains innovation and promotes progress in improving both safety and environmental risk.

The process is perhaps best illustrated by the international response to Macondo. After the disaster, virtually all the countries with oil capacity initiated an examination of their oil spill responses and regulation. However, the real burden of examination was actually taken by the companies themselves.

In the UK, the real job was not taken by DECC the regulator but, with government encouragement, by industry and other representative groups. The Oil Spill Prevention and Response Advisory Group (OSPRAG) was formed, a body from the industry, trade unions and the regulators. This, in turn, set up three committees: a Technical Review Group, an Oil Spill Response Group and an Indemnity and Insurance Review Group.

These groups split into a variety of committees to examine 'best practice' right across the industry. The technical group examined well-capping, well control, human factors and competency, and a variety of issues concerning well flows. A specific result was that a new OSPRAG emergency capping device was built, weighing 40 tonnes and capable of operating at depths just over 3,000 metres. This is now based in Aberdeen and can be used in any Macondo-type event.

However, the Oil Spill Response Review Group examined the system and recommended various adjustments, most notably concerning the availability of vessels for dispersants, but also formed a permanent committee to continuing to examine the issue on a regular basis. It should be part of the job of the regulator, or an emergency response agency to encourage this sort of inter-company co-operation. It is fundamental to 'best practice'.

EMERGENCY RESPONSE TO SPILLS

For in the vast majorities of less important cases of oil pollution, it is the operator that is responsible for emergency response, not the state. Only then the incident concerned becomes serious and beyond the capacity of the individual companies and its allies in the rest of the industry does 'best practice' require the resource of the government.

This is, first and foremost, because the vast majority of incidents are small. The industry commonly divides oil-spill related emergencies into three; tier 1, tier 2 and tier 3:

A tier 1 spill is less than 10 tonnes or 70 barrels.

A tier 2 spill is between 10-1,000 tonnes or below 7,000 barrels.

A tier 3 spill is anything over 1,000 tonnes or above 7,000 barrels.

However, such numbers are merely advisory. For obvious reasons, any small spill can easily escalate upwards. Equally, spills may differ in the level of both danger and environmental damage. For example, volatile condensate, or natural gas liquids (NGLs) may create a significant safety hazard with the potential for explosion, but may produce little environmental damage because the fuel evaporates into the atmosphere.

With tier 1 spills, then, the operator should be able to handle the matter with its own resources. It will put into action the emergency actions outlines in the OPEP. It is also mandatory for the regulator to be notified of the spill, regardless of how small. This will give the inspectorate information about the operator's behavior and maybe trigger an investigation into the cause.

Tier 2 spills should also be the responsibility of the operator, but there should be provision for secondary help from the government in the area. In the Philippines for example, the local coast guard will have a local plan and co-operate. In the UK onshore, local government makes provision of local fire, police and medical resources will be made available. This provision may well be part of wider emergency plans for say, flooding or even terrorist activity.

Tier 3 spills require a coordinated national emergency response, in effect, while the operator will remain the prime mover, as BP was with Macondo, the government has a coordinating role, because it can marshal its own resources in aid to the operator, concern itself with any international aspects of the crisis and drive the response forward.

This is fundamental. As Obama did with Macondo, the government agencies involved have a responsibility to put pressure on the operator to get the wells under control as rapidly as possible and also to make sure that the chosen solution is acceptable. In the Izmir Refinery fire for example, the expert advice was to let the refinery burn out. This was unacceptable to the Turkish government because it would have meant weeks of heavy smoke polluting a major city. The operator was effectively forced to take action to put out the fires.

The processes involved in the event of a spill should be prepared beforehand. In the UK, the US and elsewhere, as noted, such a plan is part of the process of regulation. A UK OPEP will show that a detailed Blow-out Contingency Plan is in place.

This will have a chronological sequence of the actions to be taken and estimates for the time needed. In the event of a blow-out for example it may take a few days to get the necessary equipment, fire control, well-head access, BOP removal and so on. The company must have a strategy and tell DECC what it is. DECC will then say whether it is adequate and how they can support it. This will be outlined in the national spill emergency plan.

A NATIONAL OIL SPILL EMERGENCY CONTINGENCY PLAN

Such a plan links up the operator with the resources of the state and makes sure those resources are available. It focuses minds, by imagining potential scenarios, and seeing what would happen if they did. This is a two-way street. If the operator is put under pressure to respond as rapidly as possible, the state has to be able to co-ordinate its own resources to go to their aid. This is because it is essentially in overall charge. It has to make sure that it itself knows what its doing, since its job is coordinating its own assets. Consequently it is important to practice with large exercises, using real installations.

The UK, for example held a major exercise, in May 2011, called 'Exercise Sula' with a scenario that produced an uncontrolled release from a deep water well with expected arrival of a large slick onshore in 8 days. Because of the position of this real Chevron well, this involved twelve individual agencies, including Chevron itself. A detailed report of 67 pages was subsequently produced to examine the co-ordination. Various recommendations were made for improvement. Such exercises should be both regular and as close to reality as possible in 'real time'.

In the UK the key government official is the Secretary of State's Representative for Maritime Salvage and Intervention (SOSREP). This is a permanent government position, usually given to a man with extensive maritime experience from the coastguard. He is responsible for shipping accidents as well as offshore oil spills.

He is empowered to make decisions without delay and without recourse to higher authority. His job is to assess the risk to safety of an incident and assess what measures are needed to be taken in the public interest and override the interests of anybody else, including any politicians.

In a crisis, an Operations Control Unit (OCU) is established to monitor operations to contain any potential pollution from the installation and its reservoir into the sea. The Unit only assumes control, if and when, SOSREP issues a direction, which in relation to offshore oil is generally tier 3.

The approved oil spill contingency plan for the installation must identify the location for the OCU and this needs to be in close proximity to the operator's Emergency Control Centre. This OCU requires the same support and structure as a Salvage Control Unit and has similar links to other operational units engaged in other tasks including search and rescue, clean up at sea and shore line, and anything else appropriate. The administrative support required by the OCU will be provided by DECC and the Maritime and Coastguard Agency (MCA).

The MCA is responsible for the National Contingency Plan for Marine Pollution from Shipping and Offshore Installations. It is an organization with 1,200 employees and can call upon 3,500 volunteers. It is responsible for coordinating rescue, clean up on the sea and beaches and organizing air surveillance.

Since the OCU is set up in close relation to the Company Emergency Control Centre (ECC), there are thus two effective teams, one from the company and one from the regulators, with an effective line of reporting and links to an ultimate decision-maker, the SOSREP. The control of the crisis will thus move along the original reporting lines of the company as proposed in the original OPEP, with the addition of links into the government chain of command.

In the North Sea, there are a variety of international agreements regarding actions to be taken in the event of a spill. Norway and the UK have a Joint Contingency Plan regarding any counter measures for pollution that comes within 50 miles of the median line between them. In addition, the Bonn Agreement requires that all the countries on the North Sea shoreline are informed of how any oil spill is likely to affect them and they have pledged to assist each other in handling the spill on a cost recovery basis. Finally, the European Maritime Safety Agency has 13 pollution response vessels and also lists all commercially available vessels for oil skimming.

In the US the responsibility for oil spills is divided between the Environmental Protection Agency (EPA) and the Coast Guard, with the EPA dealing with onshore spills and inshore waters and the Coast Guard handling coastal waters. The actions of both are triggered by the National Response Center. (NRC). It is obligatory to report spills over 42,000 gallons, of which there are over 30,000 a year, to this agency. It will then activate the National Oil and Hazardous Substances Pollution Contingency Plan as required.

Depending on the type of spill and its extent, a Federal On-Scene Co-ordinator (FOSC) will be dispatched to take charge of minimizing the damage of any such spill. The FOSC is the rough equivalent of the UK SOPREP and will have under him/her a National Response Team (NRT) consisting of representatives from 16 Federal Agencies. In support of the NRT are 13 Regional Response Teams, with further support from scientists from both the EPA and the Federal National Oceanic and Atmospheric Administration (NOAA).

The US Coast Guard has a National Strike Force, which contains within it a Coast Guard Oil Spill Removal Organization, specifically trained for oil spill removal. This is backed up by \$30 million-worth of oil spill response equipment and a large Response Resource Inventory of ships and equipment potentially available in the event of a major spill. It is fair to say that without this preparation the Macondo spill would have been even more damaging than it was. Furthermore the Coast Guard has spent the past 20 years since the Exxon Valdez, refining its technical and managerial ability to deal with oil spills, giving it a capability unmatched elsewhere.

Clearly few other nations have the resources to match the US in this kind of emergency response. However, this reinforces the need for high quality oil industry regulation and the implementation of best practice. This is not necessarily as difficult as it may seem if a goal-setting system is in place. As noted the oil industry is international in scale and should carry with it the techniques and management skills from best practice developed regimes into less developed countries.

For example, BP has introduced an Oil Spill Response Plan system into Azerbaijan, Georgia and Turkey in relation to its Baku-Tblisi-Ceyhan pipeline system, based on experience elsewhere. This has a substantial list of requirements for any contractors to be employed in emergency response related to known requirements.

Most countries have a naval and coast guard capacity, which should be capable of developing spill removal expertise in line with a national emergency plan. Furthermore, there are many private emergency response companies around the world that can be called upon to come to the aid of oil companies in the event of a disaster. These range from the famous Houston-based Boots and Coots International Well Control for blowout control and the Oil Spill Response Limited (**OSRL**) for wider issues. OSRL, made up of expertise from across the industry, has offices around the world and has been involved in hundreds of oil spill emergencies.

The use of private emergency response alliances and companies is entirely in line with the general trend in regulation. It is after all the oil industry itself that has the expertise to implement 'best practice' and clear up the pollution when it occurs. It is the state's job to make sure that it does so.

ISSUES RELATING TO NIGERIA

With the Petroleum Industry Bill (PIB) now going through the Nigerian legislature many of the issues related to regulation are under review. One of the major aspects under discussion has to be the relationship between the existing regulator, the Department of Petroleum Resources (DPR) and The National Nigerian Petroleum Corporation (NNPC). Since both are under the auspices of the Ministry of Petroleum, and thus the same Minister, the question of priorities arises.

Since it is the function of the Ministry to issue licenses and generally encourage investment in the Nigerian oil sector, it has a vested interest in maximizing production. In addition, since the main aim of this activity is to raise revenue for the Nigerian state, the Ministry's willingness to forgo production as a result of enforcing regulatory standards must be questioned.

In practice, this may not, in fact, be the case. However, regardless of whether there is a reluctance to reduce production, the DPR will always remain subject to allegations that it is too close to the revenue raising functions of the Ministry and thus 'captured' by it. Such accusations have been regularly raised by the Nigerian press and by Western NGOs.

Given the overall crisis of pollution in the Delta, the PIB offers an opportunity to separate the future regulator from the Ministry's function of encouraging greater production and thus revenue. It is also a means of establishing that the new regulator is not directly dependent on oil revenues and establishes 'an arms length' relationship with the industry.

The degree to which the DPR currently demands operational plans for environmental protection as a part of the licensing process or how it monitors them is unclear. What is clear is that the agency is dependent on the oil companies for transport to and from various installations and that this is widely seen as a weakness by outside observers. In fact, this is by no means unusual in many jurisdictions. With the exceptions of the US, few regulatory regimes have the resources to provide their inspectors with independent transport.

Thus an independent regulator does not necessarily have to have such independent transport. The important point is that in most regulatory regimes, the inspectorate can demand transport, for both routine inspections and for 'surprise' ones when it judges it necessary. It is an obligation of the installation operator to provide such access, whenever it is demanded.

A further aspect of best practice in oil field regulation that is by no means clear in Nigeria, is that the legal obligation to report spills to the DPR is not followed as rapidly as it might be. There are reasons for this, in terms of the terrain and also the various forms of spill, many of which are relatively small. Up until now, it would appear that the industry reports spills as soon as it discovers them, rather than following the timescale of the law.

Furthermore, most 'best practice' regimes require that records and news of such spills are publically available. While clearly such information is not generally given widespread release, in most regimes it is available to anybody who has a desire to know it. This is a major part of the public relations battle in open regimes. At minimum, it can refute the charge of secrecy and cover-up. In addition, the data can show the success, as well as the failures of regulation, by reporting a decline in incidents. There are signs within the PIB that this is now recognized.

In relation to environmental protection, there is little doubt that Nigeria has some extremely valuable laws. Some indeed date from the time of independence and are effectively part of the Nigerian Constitution. The central problem lies in the enforcement of these laws and guidelines. The Federal Environmental Protection Agency Act (FEPA 1992), the Environmental Guidelines and Standards for the Petroleum Industry in Nigeria (EGASPIN revised 2002) and the Environmental Impact Assessment Act (EIAA 1992) all provide for a strong regulatory framework.

Unhappily, there is plenty of evidence that such legislation is rarely adequately enforced. A classic example is the Associated Gas Re-Injection Act (Amended 1985), through which the Federal Government has persistently demanded an end to gas-flaring, but whose target dates have regularly passed by since its inception, with no real effect on the flaring. There are plenty of other such examples. In effect, the legislators have done their job, while the regulators, whether through lack of resources or conflicts of interest, have not.

One of the reasons for this in regard to pollution from hydrocarbons almost certainly lies in the division of responsibilities regarding the environment between the Ministry of the Environment, its two agencies – the National Environmental Standards and Regulations Enforcement Agency (NESREA) and the National Oil Spills Detection and Response Agency (NOSDRA) – and the Ministry of Petroleum Resources, with its regulator the Department of Petroleum Resources (DPR) and the national oil company, the Nigerian National Petroleum Corporation (NNPC).

As noted, there is also a significant conflict of interest between the DPR and the NNPC within the Ministry of Petroleum Resources. This is in turn mirrored by a conflict of jurisdiction and role, between the DPR and NOSDRA. The former has EGASPIN as its major guideline, while the latter should logically operate under FEPA.

Yet because of the role of the DPR and the existence of EGASPIN, the Ministry of the Environment appears to see the oil and gas industry as, in effect, off limits and none of its concern under FEPA Act. In so far as it has a role, the environment ministry through NOSDRA, effectively tries to act as a kind of ‘first responder’ after oil spills and if it tries to intrude on the DPR’s role in terms of prevention or regulation, is seen as acting beyond its jurisdiction. An additional issue is that the reporting of spills and the data base collection is in effect duplicated.

The simplest solution to resolve these various conflicts of interest would be for the Nigerian Federal Government to follow the example of the USA, Australia, Norway and other governments and give the environmental regulation of the oil and gas industry to the Ministry of the Environment. This would involve giving the responsibility for the enforcement of EGASPIN to this ministry.

In legal terms this would mean that the EGASPIN guidelines would be subsumed under the more general law of the FEPA Act. In terms of personnel, the environment ministry would need the expertise of the experienced personnel of the DPR in dealing with the industry. In effect the regulators within the DPR would be moved into the Environment Ministry to create a ‘Super-regulator’, which would also involve personnel from NESREA and NOSDRA.

Given the specialist understanding of the oil industry required of existing DPR regulators, these new ‘super-regulators’ would need to be rewarded as least as highly if not more highly than they are now.

Failure to do so would be to run the risk of a loss of this expertise to the industry itself. Equally, the presence of a highly rewarded team of super-regulators with the Environment Ministry would enhance its prestige and thus raise the profile and importance of environmental regulation in general.

Nigeria thus has many dilemmas in relation to regulatory best practice. To state the obvious, the country’s high level of pollution is the result of previous bad practice, conflict, corruption, bunkering and artisanal refining. Any new regulatory rules are unlikely to have a significant effect on the pollution in the Delta that already exists.

However, that said, a goal setting regime, based upon collaboration reinforced by the enforcement of the approved plans of the industry itself, would greatly enhance the prospect of cleaning up the Delta. For there is a balance of interest between the Nigerian state and the International Oil Companies (OICs). If the OICs can threaten to withdraw from the country, the Nigerian state can point to the potential for international litigation on the level of environmental damage they leave behind. The establishment of ‘best practice’ regulation is fundamental to the success of this balance.

MEMORANDUM ON 'BEST PRACTICE' IN ENVIRONMENTAL PROTECTION IN THE OIL INDUSTRY IN RELATION TO OIL SPILLS

- (1) The Petroleum Industry Bill now being prepared in the Nigerian Legislature offers a major opportunity to restructure the regulation, the emergency response procedures and the issue of dealing with oil spills of the Nigerian oil industry.
- (2) In this context it is important to analyse international 'best practice' elsewhere in the world and compare it with what happens in the current situation in Nigeria to highlight and identify any potential changes which might be made.
- (3) Regulatory changes in oil field practices outside Nigeria have almost always followed major accidents forcing revision of existing regulation, as these accidents highlighted significant weaknesses in existing systems. The Alexander Kielland disaster in the Norwegian North Sea, the Piper Alpha disaster in the UK North Sea, the Enchova disaster offshore Brazil, Montara off Australia and, of course, most recently the Macondo disaster in the Gulf of Mexico have all caused major shifts in the way the oil industry is regulated in their respective areas. (Appendix 1)
- (4) The key regulatory shift caused by these disasters has been to reduce government prescription in oil field practice and shifted the level of risk onto the operators, rather than government. The aim has increasingly been towards demanding that the companies create 'best practice' and seek agreement from the regulator, rather than for governments to tell them what to do through specific and detailed legislation. Furthermore, there has been a growing trend towards much greater environmental protection worldwide. Industrial pollution allowed some thirty years ago is no longer tolerated.
- (5) This may seem counter-intuitive, in the sense that it might be expected that major accidents would increase rather than reduce government regulation. However, what such accidents clearly reveal is that no amount of engineering prescription or 'box-ticking' can actually prevent disaster. What matters is the degree to which the operators are alert to environmental and safety issues, have plans to deal with emergencies and have a well-trained and disciplined workforce. The aim is to shift the level of risk away from governments towards the companies and enforce good corporate governance.
- (6) After an initial period when regulators in a variety of countries attempted to prescribe a set of engineering regulations for oil field practice, a more arms-length type of system has emerged, with the emphasis increasingly on the operator's efficiency and planning. The regulator is thus no longer prescribes 'best practice' but rather gives or withholds permission for operations, according to its approval of the companies financial, engineering and environmental awareness and its individual plans for installations.
- (7) However, in order to do this, the regulator must have the ultimate sanction of refusing an operator a licence to operate, or to shut down any facility deemed inadequate, if that licence has already been granted. Equally, it must have the power to insure that the operator keeps to those plans that have been previously agreed and this too requires a list of potential sanctions including fines and potential criminal charges against an operator who persistently does not keep to its own plans.
- (8) This ability to stop bad practice is severely inhibited, if the regulator is also responsible for revenue-raising from the oil industry, or be part of a ministry whose primary function is to maximise revenue from oil, regardless of the consequences. Separation from the government's revenue raising functions is increasingly a universal requirement for 'best practice' regulation. In the UK, this was a consequence of the Piper Alpha explosion and after Macondo, the US regime shifted its royalty raising function away from its regulatory functions when it split up the Minerals Management Service of the Department of the Interior into three. (2 charts)
- (9) It does not in fact matter where in the government structure the regulator lies, as long as it has the powers to enforce sanctions if the companies do not follow the rules they themselves have created. In some jurisdictions, the regulator lies within the Department of the Environment. In others, it lies within the Ministries of energy or oil. Some regulatory regimes divide environment control from health and safety as in the UK. In Australia, the regime now places all aspects of oil regulation except revenue-raising in one single institution.
- (10) The key element in spill prevention, both regarding health and safety and environmental protection, is the oil company. It is not only invariably the 'first responder' in the event of an accident, but also must bear the risk.

- (11) The company is thus responsible for producing its own safety and environmental case. It is responsible for keeping to 'best practice'. Even in the event of a tier 3 emergency, the company still bears the primary responsibility for emergency action.
- (12) To meet these requirements, the regulator must have the power and resources to assess the company's overall capacity to operate safely, effectively and efficiently and be able to refuse permission for its operations. This requires a thorough examination of the company as a whole, with the regulator given the necessary powers to examine documents and personnel. Is the company financially capable of doing what it promises? Has it the financial resources to deal with any emergency and its outcome? Does its record suggest that it can operate safely? Is it environmentally aware and does it have internal systems in place to deal with any eventuality?
- (13) In most jurisdictions, this responsibility is also outlined in an agreed plan for all installations, known in the UK as the Oil Pollution Emergency Plan (OPEP), in the US as an environmental impact statement (EIS) and a Safety and Environmental Management System (SEMS) or in Australia as a Well Operations Management Plan (WOMP). It is the regulator's job to judge this plan and, once accepted, make sure that the company keeps to it, through inspection. In the US, the SEMS has become considerably more detailed over time and is now mandatory.
- (14) 'Best practice' clearly requires reporting of all spills to the regulator, although in most cases, will not require additional help to the operator from the state. Tier 1 spills are normally entirely the responsibility of the operator, often limited to the workforce of the installation involved. Tier 2 spills may require access to the wider resources of the company, beyond the installation. However tier 3 spills will need extensive support from government resources, co-ordinated by a senior governmental representative, notably the Secretary of State's Representative (SOSREP) in the UK and the Coastguard in the US and elsewhere. (Appendix 2)
- (15) This co-ordinating body will have dictatorial powers in relation to control over the area and must approve any actions taken by the company. It also takes the responsibility of liaising with foreign governments should that be necessary and accessing equipment from elsewhere. It is an obligation of this co-ordinating body to supervise major training drills and exercises and establish that the companies are fully trained and resourced for any emergencies.
- (16) In Nigeria at present, the Department of Petroleum Resources (DPR) is the oil industry regulator within the Ministry of Oil and the National Oil Spill Detection and Response Agency (NOSDRA) is the emergency responder and co-ordinator within the Department of the Environment.
- (17) In relation to the DPR, the regulator operates within the same ministry as the Nigerian National Petroleum Corporation (NNPC). As such, while it has the power to refuse licenses and indeed stop operations, the DPR has to be conscious of the role of the NNPC and its revenue raising functions. The impact of any suspension of a license on the NNPC within its own ministry has to be taken into account. The DPR may thus be inhibited from taking any firm action that may be required because of its impact on any production sharing agreements, or joint ventures agreed by the NNPC. Because of the NNPC's major role in the Nigerian oil industry, this effectively means all of the industry and all of its operators.
- (18) Meanwhile, NOSDRA's role remains ambiguous. Its role in dealing with tier 3 spills is entirely in line with best practice elsewhere, as a government agency co-ordinating major disasters. However, it is also apparently responsible for reacting to much smaller tier 1 and tier 2 spills, which should be primarily the function of the operator. It is also responsible for collecting data on spills that are also monitored by the DPR, thus duplicating this activity. However, if purely confined to tier 3 spills, the agency is larger than its equivalents elsewhere like the SOSREP, or much smaller and less resourced compared with agencies like the US Coastguard which have many more responsibilities elsewhere.
- (19) However, the main regulatory framework regarding environmental pollution in the Nigerian system, EGASPIN, lies within the jurisdiction of the Department of the Petroleum Resources (DPR). These standards are as good as any in the world and need no revision. What matters is enforcement of them and it is questionable whether this department has the capacity to do so, either with NOSDRA, or independently. The UNEP Report on Ogoniland recommended that oversight of EGASPIN should be transferred to the Federal Ministry of the Environment. (Appendix 3)

- (20) The Petroleum Industry Bill creates an opportunity to break up this existing structure and greatly increase environmental protection, particularly in relation to oil spills. It offers the prospect of a new regulator and independent inspectorate.
- (21) In the case of such an inspectorate, it would obviously be valuable to distance this regulator from the NNPC to reduce the influence of potential income on regulatory decisions. As the NNPC becomes a more independent commercial entity, its influence on the regulatory framework and on policy-making should in any case decline.
- (22) Such a regulator would thus become a more independent entity, greatly increasing its ability to regulate. As such, it could form an independent inspectorate effectively taking all responsibility for licensing and approving all activities in the oil sector.
- (23) However, this would not obviate the need for EGASPIN to be enforced, which is currently the responsibility of the DPR. One possibility might be to transfer responsibility for EGASPIN to the new inspectorate, as a factor in the more general regulation of the industry. However EGASPIN is particularly important in relation to ground water generally, which is likely to remain as an area of concern to the Department of Environment.
- (24) One way around this would be if the tier 3 responder was also to be subsumed into the new inspectorate, taking responsibility for EGASPIN and for oil related water pollution with it. It might also be an advantage if the new regulator and inspectorate was to combine the role of data collection, with the tier 3 responder section of the new inspectorate creating a new and publicly recognised first point of call for the reporting of any new spills from the general public. This would reduce the confusion of having several different sets of oil spill data and greatly aid analysis of their causes. The roles of regulator and first tier 3 co-ordinator are not necessarily incompatible. Indeed the newly-formed inspectorate should develop emergency response capacity and initiate the exercises/drills necessary to check whether operators are following their own OPEPs.
- (25) At present, there is not only an overlap between the roles of the DPR and NOSDRA, but dual reporting lines for the companies regarding emergency plans. This creates confusion for operators in that two different agencies can conceivably adjust any OPEP-type plans made by operators.
- (26) Aside from subsuming the functions of both the DPR and NOSDRA into the new independent inspectorate, one way of increasing environmental controls might be to greatly strengthen the Nigerian Department of Environment to deal with the oil industry, via EGASPIN regulation. This might involve a dual system of controls with the oil ministry assessing safety and licensing concerns, but with the environment ministry also having the power of veto in relation to the risks to the environment. This would follow the Norwegian model, where the Petroleum Safety Authority reports to the Ministry of Labour and the Pollution Control Authority reports to the Ministry of the Environment.
- (27) Alternatively, if it is the case that under the new PIB, the NNPC remains a substantial part of the Nigerian oil ministry, then clearly environmental controls should be more fully transferred to the Department of the Environment, giving it powers of veto over operators plans. This would involve turning NOSDRA into a regulatory agency, as well as tier 3 responder, primarily to enforce EGASPIN regulations.

- (28) Both of these two latter alternatives require a high degree of co-operation between Nigerian departments of state and may add to the complexity of such regulation. Such an organisational structure would require a mutual agreement as to the responsibilities of each agency to avoid a similar conflict of roles that currently exists between the DPA and NOSDRA.
- (29) Consequently, the simplest solution remains a single independent inspectorate assuming responsibility for both 'goal-related' regulation and tier 3 response. This would follow the Australian model with its National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA).
- (30) Overall, global trends in regulation are increasingly regarding environmental protection as an important part of oil industry regulation as health and safety. Regulation has shifted over time and as the result of experience towards much less tolerance of oil spillage. If the trend is away from prescription towards 'goal-setting', it has also shifted regulation away from any government revenue raising activities and equally, put far more emphasis on environmental control. Post-Macondo, this trend is unlikely to change.

APPENDIX 1

MAJOR DISASTERS THAT CHANGED REGULATION

Government regulation of the oil industry has largely shifted from prescription to a 'goal centred' approach as a result of experience. Major accidents first drew attention to major safety issues and then to the issue of pollution.

Prior the Alexander Keilland accident in 1980, the Norwegian regulators tended to over-regulate, specifying requirements in the engineering of any platform, involving extensive examination of design. This regime suffered its first accident with a blow out on the drilling platform Ekofisk Bravo in 1977. Caused by an incorrectly down-hole safety valve, this first ever North Sea spill was explained almost entirely by human error. There was nothing wrong with the actual equipment that had been specified by the regulator.

Similarly the Alexander Keilland, an accommodation platform which turned over in 1980, was caused by a faulty weld at the time the semi-submersible had been built in 1976. With the loss of 123 people, attention rapidly became focussed on the inadequacy of the lifeboats and the organisation of the people on board at the time and the lack of safety training. Once again, neither the faulty weld, nor the lack of lifeboat drills onboard could have been rectified by government regulatory prescription. The loss of life was the result of inadequate company training, while the faulty weld was the responsibility of the French shipyard.

Two years later, the Ocean Ranger drilling rig capsized and sank off Newfoundland, with the loss of 84 lives. It was one of the largest and most modern drilling rigs, but its crew had not been trained in how the ballasting system could be operated manually in an emergency, when the chain lockers flooded. There was nothing structural wrong with the rig, which might have been criticised by the regulator and it was the responsibility of the operator rather than the regulatory regime that manual ballast control was understood by the crew.

The Piper Alpha explosion in 1988, which killed 167 people revealed a catalogue of errors, mostly related to human error created by the slipshod way the platform was run. The initial explosion was caused by the failure of maintenance personnel to adequately explain that a condensate valve was under examination and not be used. The resulting explosion blasted through a fire-wall and forced the abandonment of the control room within ten minutes. The fire prevented personnel from getting to life-boat stations, nor could the fire-fighting system be activated. The fire might well have burnt itself out, had not the neighbouring platforms of Tartan and Claymore not continued to pump oil and gas into the system linked with Piper Alpha in spite of the fact that these platforms could see the fire on Piper Alpha. They did not stop pumping because they had not been told to do so. As a direct result, the inspection and control of the safety case was handed to a newly formed specialist part of the Health and Safety Agency and thus away from the Department of Energy. At the time, the latter was the main agency for encouraging the development of North Sea oil production and felt to be too close to the oil industry.

Brazil has had a whole series of offshore difficulties. Back in 1984, a blow-out on the Enchova Central platform killed 42 people revealing faulty life-boats and evacuation procedures. The same platform suffered another blow-out in 1988, becoming a total loss, with the crew saved only because it was attached to an accommodation platform. Nearly 20 years later, the P36, then the largest drilling semi-submersible, sank after being on fire for five days. The loss was blamed largely on delay in using a drainage pump and an overall failure of operating procedures on board. Regulation of the oil industry has been sharply criticised, because of the closeness of the regulator, the National Petroleum Agency, to Petrobras. The national oil company has an obligatory 30% of most blocks, while maintaining a very high rate of activity.

The Montara oil spill in the Timor Sea followed a blow out in 2009 releasing 2,000 barrels a day for three months before it was capped. The subsequent inquiry revealed that the cause of the accident was the failure of a cemented casing shoe, which had not been revealed by extremely detailed regulatory inspection. Prior to Montara, the Federal Agency responsible for the National Offshore Petroleum Safety Authority and environmental issues were handled by State and Territory Designated Authorities, in this case Northern Territories, which had a vested interest in maximising production. The Montara Inquiry demanded a single health and safety authority and created the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA).

The Macondo/Deepwater Horizon oil spill showed that even after detailed rig inspection of the rig, the blow-out preventer still failed. BP was heavily criticised by a US Government panel for failing to monitor its contractors sufficiently and failing to apply the same standards of safety and environmental 'good practice' to them as to its own drilling rigs. Equally, it failed to recognise the wider risks in its activities, focussing too much on details. Significantly, the US Federal Government put a moratorium on drilling in the Gulf for six months, while an investigation took place. The Minerals Management Service of the Department of the Interior was split into three. Royalty management was shifted into the Office of Natural Resources Revenue. The Bureau of Ocean Management (BOEM) is responsible for planning the environmental exploitation, including resource allocation (licensing) and exploration permits. The Bureau of Safety and Environmental Enforcement (BSEE) is responsible for offshore inspections, safety enforcement, oil spill response scenarios, training in environmental management and compliance.

(UK and US charts)

APPENDIX 2

THE ROLE OF THE UK'S SOSREP

The SOSREP is a permanent government position, usually given to a man with extensive maritime experience from the coastguard. He is responsible for shipping accidents as well as offshore oil spills. He is empowered to make decisions without delay and without recourse to higher authority. His job is to assess the risk to safety of an incident and assess what measures are needed to be taken in the public interest and override the interests of anybody else.

An Operations Control Unit (OCU) is established to monitor operations to contain any potential pollution within the installation and its reservoir. The Unit only assumes control, if and when, SOSREP issues a command to do so, which in relation to offshore oil is generally a tier 3 incident.

This OCU requires the same support and structure as a shipping emergency and has similar links to other operational units engaged in other tasks including search and rescue, at sea clean up and shore line clean up, as appropriate. The administrative support required by the OCU will be provided by DECC and the Maritime and Coastguard Agency (MCA).

The MCA is responsible for the National Contingency Plan for Marine Pollution from Shipping and Offshore Installations. It is an organization with 1,200 employees and can call upon 3,500 volunteers. It is responsible for coordinating rescue, clean oil from the sea and beaches and organizing air surveillance. An OCU is normally set up in close relation to the Operator's Emergency Control Centre (ECC). There are thus two effective teams, one from the company and one from the regulators, with an effective line of reporting between each other and an ultimate decision-maker, in the SOSREP.

The SOSREP has the power to declare a temporary exclusion zone requiring all ships to re-route. He has to approve all actions taken by the company as well as co-ordinate with foreign governments regarding any aid. The role was created in 1999 after an enquiry into the Sea Empress tanker spillage. His decisions are made without reference to higher authority, the only sanction from government being to back him or fire him.

APPENDIX 3

ENVIRONMENTAL GUIDELINES AND STANDARDS FOR PETROLEUM INDUSTRY IN NIGERIA (EGASPIN)

The EGASPIN guidelines were first introduced in 1991 and then revised in 2002, written and administered by the DPR. They set out the powers of the DPR, which include seizure of premises, impose fines and shutdown of installations. They also require monthly inspection of pipelines and clean-up of all spills within 24 hours with the complete containment and removal of spilled oil. They require companies to continue to monitor spill sites after clean-up. For all waters the demand is that there is to be no visible sheen after the first 30 days and in swamp areas no sign of oil after 60 days. EGASPIN also intriguingly suggests that there is a fund to compensate operators for any clean-up costs incurred, if the spill is not their responsibility. Standards relating to spillage and clean-up are very precise and established and are probably as good as any guidelines anyway.

The problem is that they are not enforced. The UNEP Report on Environmental Assessment of Ogoniland, showed many areas contaminated way beyond the 50 mg/kg of total petroleum hydrocarbon EGASPIN target range and sometimes well above the 5,000 mg/kg EGASPIN intervention level. A third of all areas studied were seriously impaired. The oil companies themselves admit that either they cannot start clean-up operations within 24 hours and regard themselves as lucky to get clean-up started within several days.

Furthermore, it is not clear whether EGASPIN is legal enforceable, in spite of the powers it apparently gives the DPR. It is not clear whether EGASPIN falls under the Petroleum Act of 1969 in which case it would be enforceable. If not, then it would appear that they are merely guidelines.

