

Health and Safety Executive Board		HSE/12/48	
Meeting Date:	27 June 2012	FOI Status:	Fully Open
Type of Paper:	Above the Line	Trim Ref:	2012/0244371
FoI Exemptions:			
Keywords:	regulation, renewable energy, new energy		

Ensuring the effectiveness of regulation of new energy sectors

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Issue

1. The HSE Board discussed the Emerging Energy Technologies (EET) programme in December 2010 (HSE/10/93) and concluded that the general provisions of the Health and Safety at Work etc Act 1974 and associated core regulations were sufficient to regulate the new energy sectors unless clear evidence to the contrary emerged.
2. This paper sets out the work currently being undertaken across HSE to ensure the effectiveness of regulation within the new energy sectors. This builds on the regulatory approach developed by the EET programme and draws on HSE's experience of monitoring new energy sectors to date.

Timing

3. Routine. Reference to the measures in place to monitor the effectiveness of regulation in the new energy sectors is included in the HSE Corporate Plan.

Recommendation

4. That the Board notes and agrees HSE's current position and approach, confirming that it is in line with the original steer given at the HSE Board meeting in December 2010.

Background

Hazard and Risk Profile

5. The methods adopted to monitor the effective management of health and safety risks within the new energy sectors are those which HSE has successfully employed in a range of industries i.e.;
- consideration of the rate of incidents and fatalities,
 - assessment of the level of leadership displayed by the industry to develop effective risk and health and safety management practices,
 - evidence of major accident hazard potential as knowledge of the intrinsic hazards of new technologies and processes develops,

- identification of specific risks and assessment of the evidence of effective risk control in an industry, such as HSE's current projects for the wind and waste to energy industries (see para 10 below).

Our regulatory policy is to closely monitor these factors, provide supportive regulatory intervention, and focus on any specific industries where these signals indicate a cause for concern.

6. As well as the management of the hazard and risk profile outlined above, HSE needs to consider the existing legislative architecture and other potential legislative measures, particularly EU obligations, when assessing whether appropriate regulation is in place for any industry sector.
7. When considering the new energy sectors there are clear differences in the hazard and risk potential between different industries and activities. Those mainly in renewable energy areas - e.g. onshore and offshore wind, waste to energy, and photovoltaic (solar) - although not without significant risk, would not be considered of major accident hazard potential. Many renewable energy industries also cover microgeneration facilities, which are defined in the Green Energy Act as 'less than 50kW for electricity' and 'less than 300kWth for heat'. Whilst we are still developing policy on our vires and engagement with this sector, HSE considers these to be lower risk areas which do not require proactive inspection.
8. However, there are some industries and activities that HSE considers have major accident hazard potential including; carbon capture and storage, hydrocarbon gas storage, shale gas extraction, underground coal gasification and LNG regasification. The different regulatory monitoring and intervention approaches appropriate to the two groups are outlined below.

Non-Major Hazard (Renewables) Energy Sectors

9. Activity to date has been to encourage the development of effective leadership and good practice, whilst monitoring incident rates in these industry sectors.
10. Specific Key Emerging Energy Projects (KEEPs) focused on offshore wind energy and waste to energy are being carried out in OPSTD to gather, monitor and analyse evidence on the effectiveness of risk control in these industries. A further similar project is looking at onshore wind energy. These KEEPs (due to end in September 2012) will provide information to help HSE assess the lifecycle stages that present significant risks of fatalities, major injuries or serious health impacts. The KEEPs examine the adequacy of risk control measures and their outputs will include: enforcement benchmarks, updated topic packs for inspectors, recommendations on HSE capability and longer term stakeholder engagement plans. All of these projects will support the objectives of the Electricity Sector Strategy, particularly the setting of standards and sharing of good practice by trade bodies, the clear ownership of risks through the supply chain, and adequate control of contractors and sub contractors.
11. Given the significant expansion of offshore wind turbine construction further from shore over the next few years, OSD is now providing dedicated resource to the inspection of offshore renewable activities. The findings of the KEEPs will be incorporated into OSD's offshore renewable intervention strategy. HSE's Construction Division is also undertaking specific work focused on the risks from the photovoltaic (solar) industry. Taken together this should put

HSE in a strong position to assess the effectiveness of our regulatory approach for renewable energy.

12. HSE is actively engaging with key stakeholders to complement this work including the leading trade associations, Ofgem, DECC and The Crown Estates. This helps us influence at an early stage the consideration of health and safety issues in the development and introduction of new technologies.
13. There are difficulties with monitoring incident data for renewable energy sector activities, due to the limited incident data available and the fact that incidents in this sector are not currently recorded under a specific Standard Industry Classification (SIC) code. The diverse range of activities within the renewable energy sector means that incidents are recorded against either the activity e.g. construction, or the causal factor e.g. electricity. Also, the existing system and data do not easily lend themselves to identifying potential new hazards and risks from the use of new technologies. HSE is looking at how to gather information from incident reports to inform HSE's view on the effectiveness of existing regulation.
14. HSE has completed a limited analysis of RIDDOR reportable incidents in the GB wind energy industry between 2007 and 2010. This did not highlight any underlying levels of serious injury or harm, but identified that the most frequent incidents in the sector related to transport, access, lifting and electrical safety. This review identified that systems to monitor all incidents, including near misses, might be useful.
15. HSE is working with RenewablesUK (RUK) (the leading trade association for the offshore wind, wave and tidal industries) to establish how information provided voluntarily by their members may be helpful as an indicator of general trends or particular areas of concern. We are also supporting work by RUK to identify performance indicators for current and future industry benchmarking and performance measurement. HSE is working with The Crown Estates to establish how the health, safety and environmental incident data they collect through contractual arrangements for Round 3 offshore wind development may be utilised. We also intend to assess how this information can support the identification of new hazards and risks from the use of new technologies. In addition, HSE is monitoring the work by organisations such as RUK and the G9 group (leading industry stakeholders) to establish industry agreed working practices.

Major accident hazard potential Energy Sectors

16. The new energy industries and activities that have a major accident hazard potential will receive the regulatory oversight outlined above but in view of their hazard/risk profile it may be appropriate to take additional measures to ensure the particular risks are being managed effectively.
17. A range of activities associated with the development of a new energy future are already covered by major hazard legislation and the existing mechanisms for monitoring the management of health and safety risks and the effectiveness of the legislation are applied to them. The use of hydrogen is covered by COMAH and the Pipeline Safety Regulations (PSR). Whilst Liquefied Natural Gas (LNG) is not a new technology, its scale has increased and onshore activities are covered by COMAH. LNG is also covered by the Gas Safety (Management) Regulations (GSMR) once it has been gasified and injected into the GSMR network.

18. Although the storage of gas in salt caverns is not a new technology, and the risks and control measures are well known, this is another area of expansion with the number of sites increasing onshore and storage now planned offshore. The new AOGBO will ensure that the HSWA applies offshore and HSWA and COMAH (depending on volumes of gas stored) will apply onshore. The Pipeline Safety Regulations will also apply to this work activity. There are however potential gaps in our legislation in relation to offshore activities as the regulatory coverage provided by the AOGBO is limited. The use of a gas storage, rather than a petroleum licence will preclude our existing offshore regulations from applying and onshore borehole regulation notification requirements do not apply to such work. Additionally, well integrity legislation does not appear to cover such activities. We will assess how any changes to address these issues might fit with EU legislative proposals offshore before considering domestic legislative change. In the interim, DECC has agreed that it will give HSE early warning of any drilling operations proposed in such areas so that we can intervene at the appropriate time.
19. Underground coal gasification is new to HSE and the risk and control measures related to it are unfamiliar. To date no operator has entered into detailed pilot discussions with HSE. It is the Coal Authority's expectation that initial pilots will take place onshore (due to ease of access), where the HSWA will apply. The Pipeline Safety Regulations will also apply to this work activity. Although COMAH may apply onshore depending on volumes of gas stored, the gaps in our legislation are likely to be in relation to the management of the borehole site and in relation to well integrity. Once HSE better understands the process involved and the risks associated with it, HSE can start to assess whether this has major accident hazard potential and consider the appropriate legislation.
20. For the current exploratory phase of shale gas extraction we have been working closely with DECC and the Environment Agency (EA) as much of the current public concern is around environmental impacts. Following seismic tremors experienced near shale fracking operations in Lancashire further operations were suspended so that the cause of the seismic events could be studied. HSE has contributed to a review of the potential risks of shale gas extraction undertaken by the Royal Society and Royal Academy of Engineering. DECC are expected to make a decision on the continuation of fracking imminently and have indicated that they are keen to announce an independent review of the regulation of shale gas as part of the package to support the announcement of their decision. We have had initial discussions with DECC and expect to work closely with them, EA and Scottish Environmental Protection Agency (SEPA) as part of any review. Should shale gas extraction move from the exploratory to commercial scale it could come into scope of COMAH, depending on the size of operation and onsite storage, and into scope of PSR if the gas is piped away as it is produced.
21. The development of operational Carbon Capture and Storage (CCS) projects is supported by the £1 billion DECC CCS commercialisation programme announced in April 2012. This programme replaces the previous CCS demonstration project competition. It is likely that any commercially viable projects will remain at the conceptual planning stage until the outcome of the commercialisation programme is decided in autumn 2012. Unlike the DECC CCS demonstration project, competition in the commercialisation programme will benefit several CCS operators rather than a single winner. During the commercialisation programme HSE will engage directly with the

bidders, using the experience gained during our assessment of the demonstration project. If, and when, CCS develops into industrial-scale operations HSE will regulate the operators under existing legislation. However, HSE will monitor and review the risks posed by CCS technologies and will continue to fund, and be involved in research to that effect.

Fit for purpose regulations

22. There is the potential for discrepancies to emerge if existing regulations fail to keep pace with the development of new technologies. HSE will seek to adopt a sensible and proportionate approach, facilitating new developments within the regulatory structure wherever possible, provided we have evidence of acceptable risk levels and effective risk controls. An example is the use of biogas in the main gas grid. Biogas is a mixture of gases produced by the conversion of plant and animal material by micro organisms (Anaerobic Digestion). The specification for natural gas in the GSMR is based on that extracted from the North Sea. Biogas generally has a higher oxygen level than that in the GSMR specification, raising concerns about potential corrosion of pipes. The renewable gas industry has funded research to look at this and a number of other safety issues. Subject to the findings of this research, HSE will consider issuing a class exemption, to allow development in this sector.
23. There has recently been pressure from local campaign groups and MPs for HSE to intervene in planning applications and developer risk assessments for onshore windfarms. HSE is proposing to adopt a policy of non-intervention in this regard as the planning considerations fall outside of our vires except for COMAH related sites and national infrastructure projects (arrays with a capacity of more than 50 MW)

Legislative Architecture

24. In ensuring the current regulatory approach remains valid it is important to consider other legislative measures, including any introduced by DECC in future, and the obligations arising from any new or existing EU Directives and Regulations. HSE has secured DECC support for our regulatory approach to the new energy sector and they are working closely with us to encourage industry to proactively manage the risks. The EC's Energy 2020 strategy for competitive, sustainable and secure energy focuses on five priority areas, all of which have the potential to impact on health and safety issues.¹
25. The proposed Seveso III directive includes measures related to new energy technologies. Upgraded biogases are included within scope under the generic LPG classification and the definition of petroleum products extended to alternative fuels serving the same purpose and with similar properties. There is also a recital in the proposal that the Commission will continue to review any legislative gaps in the light of new and emerging technologies.

¹ The five priorities in the European Commissions Energy 2020 strategy are 1) Achieving an energy efficient Europe; 2) Building a pan-European integrated energy market; 3) Empowering consumers and achieving the highest level of safety and security; 4) Extending Europe's leadership in energy technology and innovation; and 5) Strengthening the external dimension of the EU energy market.

26. HSE's existing arrangements for monitoring European and international activities seek to ensure that HSE is involved at an early stage in discussions on proposals which may impact on the new and renewable energy sector. Early engagement will ensure the case for alternatives to regulation can be considered at European level, and that any EU proposals do not put UK business at a competitive disadvantage. Consistency across Europe will be particularly important to ensure a cohesive energy strategy and provide certainty for manufacturers and developers where technologies cross territorial boundaries. DECC leads much of the work in this area and we have good working links with relevant DECC officials.
27. An HSE research proposal, to be delivered by HSL, is being prepared to gather information on the international renewable energy sector, identifying regulatory and non-regulatory approaches. It will focus on the work of technical opinion formers and how this guides the development of European and international standards. The research will provide intelligence on the appetite across member states for regulatory approaches to managing health and safety in the new energy sector and the latest academic views on current and future health and safety risks. HSE will chair a workshop at a major EU/US conference in July 2012 looking at international approaches to occupational health and safety in the green economy.

Application outside of Great Britain Order (AOGBO)

28. The extension of the AOGBO is an important step in ensuring we retain an effective legislative framework for new energy industries. The Order extends the Health and Safety at Work etc Act (HSWA) offshore and can also extend regulations made under HSWA offshore.
29. Increasing exploitation of offshore resources is vital to the expansion of a wide range of new energy industries. Some renewable and new energy activities such as offshore hydrocarbon gas storage, carbon dioxide storage and underground coal gasification may not currently be covered by the HSWA. Work is currently underway to revise the AOGBO to make it clear that these activities are within scope. HSE is seeking a waiver from the micro-business exemption as many offshore micro-businesses are involved in work activities with major accident potential, such as work activities associated with offshore oil and gas exploitation. We aim for the revised AOGBO to come into force in April 2013. We do not expect that the new offshore energy activities will be operational before the Order is in place.

Consultation

30. HSE's Better Regulation Unit, OPSTD, PFPD, TSol, and HID Major Hazards Policy.

Financial/Resource implications for HSE

31. There may be future implications for HSE's cost recovery if any new energy sectors warrant the introduction of a major hazard permissioning regime. It is intended that the Fee for Intervention proposals will apply to those sectors outside of a major hazards permissioning regime once they are introduced. Cost recovery is also planned to apply to the assessment, inspection and investigation of incidents at on-shore bore holes (as they do to offshore drilling), through the same set of the Fees Regulations which will implement Fee for Intervention. The research project (para 27) is expected to cost

£100,000.

Environmental implications

32. The Government and Devolved Administrations aim to achieve 15% of energy consumption from renewables by 2020, while driving down costs. This will help to de-carbonise the energy sector, provide increased energy security and mean a substantial increase in sector size. HSE makes an important contribution to these aims by ensuring supportive and effective regulatory engagement.

Action

33. That the Board;
- Notes the work undertaken since the last position paper
 - Agrees HSE's approach to ensuring the effectiveness of regulation in relation to emerging energy technologies
 - Confirms that the original steer given at the HSE Board meeting in December 2010 remains appropriate for HSE's regulation of new energy sectors.