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Paper Title	Nuclear and Radioactive Substances Regulation
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Purpose of Paper:	Information
Recommendation:	To note the content of this paper which sets out the roles and responsibilities, key Government policy areas and our future work in this area.
Decision Required:	Not applicable

Impact:	This information paper only establishes our current resource and approach so no change in impacts arises from the approach detailed below.
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Purpose of paper

1. This paper has been drafted to provide an update regarding our responsibilities for regulating radioactive substances. This is so Board members feel they have sufficient understanding of the background and current position for this work area to assess the future opportunities and potential risks to the organisation.
2. The paper covers NRW's statutory roles and responsibilities, our current working arrangements, the key Government policy areas under development and our future work in this area.
3. The paper is structured as follows:
 - NRW Roles and Responsibilities
 - Radioactive Substances Regulation
 - Nuclear
 - Non-nuclear
 - High Activity Sealed Sources
 - International Waste Shipments
 - Incident and Emergency management
 - Our current working arrangements
 - Our Service Level Agreement with the Environment Agency
 - Organisational Arrangements
 - Key Government Policy Areas
 - New Nuclear Build Programme
 - Small Modular Reactors
 - Geological Disposal Facility
 - Next Steps and Risks
4. Further information explaining radioactive substances terminology can be found in Annex 1

NRW Roles and Responsibilities

5. Natural Resources Wales has a wide range of responsibilities in this work area which include:

Radioactive Substances Regulation - Nuclear Regulation

6. We are responsible under the Environmental Permitting Regulations (EPR) for regulating all disposals of radioactive waste on and from nuclear licensed sites (NLS) in Wales. "Disposals" of radioactive waste include discharges into the atmosphere; discharges into the sea, rivers, drains or groundwater; disposals to land; and disposals by transfer to another site. All permits relating

to sites generating or disposing of radioactive waste in Wales are issued by NRW. Compliance with the permits at the 3 nuclear sites in Wales is carried out on our behalf by the Environment Agency (EA) via a service level agreement. However, we undertake any enforcement response and NRW remains the regulator holding the final decision powers. The 3 sites are:

Trawsfynydd, Snowdonia - a non-operational nuclear power station site managed by Magnox plc. This station stopped generating power in 1990 and has been in the decommissioning phase since then. The significant radioactive hazards were removed from the site many years ago and, after 25 years of dismantling, demolition and clean-up, the site is close to moving into a period called 'care and maintenance'. The site, and any structures that remain, are kept passively safe and secure state for decades with the final phase of decommissioning in 2073 to achieve site clearance in 2083.

Wylfa A, Anglesey - an operating nuclear power station managed by Magnox. Power generation at Wylfa will stop at the end of December 2015 to begin the process of decommissioning. The first phase will be to remove radioactive fuel and send it to Sellafield for long term storage, together with 'spent' fuel from the other UK nuclear sites. Once "de-fuelled" significant hazards will remain as the operator works to carefully dismantle and remove key plant, equipment and buildings. This will continue until Wylfa enters 'care and maintenance' in 2025 before entering the final decommissioning phase in 2096 with site clearance by 2105.

GE Healthcare, Cardiff - a small radioactive waste storage site which had a significant radiochemical production facility but was demolished and decommissioned satisfactorily in 2014. The permit now only covers a small on-site waste store housing intermediate level radioactive waste. It will take around 30 years to completely remove the waste on site due to capacity in the national disposal infrastructure.

7. In addition, there are 'conventional' EPR permits for two sites which we regulate; i.e. Wylfa (permits for combustion plant and water discharges) and Trawsfynydd (permit for water discharges). At GE Healthcare no conventional permit is required.

Radioactive Substances Regulation – Non-nuclear Regulation

8. We deliver the regulatory requirements of EPR in respect of radioactive substances activities at sites in Wales which are not NLS under the Nuclear Installations Act. These sites include teaching hospitals, universities, industrial radiography companies, Ministry of Defence sites etc. where radioactive substances are used and radioactive waste is stored and disposed. Wales has approximately 100 of these permitted sites. We are solely responsible for the permitting, compliance assessment and enforcement in relation to these activities.

Radioactive Substances Regulation - High Activity Sealed Sources

9. High-activity Sealed Radioactive Sources (HASS) are potentially hazardous and are subject to a rigorous regulatory regime. The EU Control of High-activity Sealed Radioactive Sources and Orphan Sources Directive (2003/122/Euratom; EU HASS) came into force in December 2003 and was introduced to provide strict control on maintaining accurate and up to date records of the location, composition and activity level of all HASS held in EU Member States. The UK government has created a national database to record this information. Typical examples of sealed source use are in hospitals as part of cancer therapies, in industry as density or level gauges. For HASS that are not located on nuclear licensed sites, we are the enforcing authority along with the EA and SEPA. We undertake Financial Provision Assessments in support of applications and renewals. We are also required for security to liaise with police Counter Terrorism Security Advisors (CTSA) to ensure arrangements on site are adequate.

International Waste Shipments of Radioactive Waste

10. All movements of radioactive wastes and spent sources across international boundaries are tightly regulated. In the UK this is required by the Transfrontier Shipment of Radioactive Waste and Spent Fuel Regulations 2008. Permission must be sought before sending such materials to another country including notifying the receiving nations regulator and also notifying us of the materials being sent. This is to ensure that such items are tracked and where problems arise the material can be repatriated.
11. All this information is held on a UK register that is hosted and operated by Scottish Environment Protection Agency (SEPA) on behalf of the UK Member State. We collate the information using our National Waste Audit Team who then send the documentation on to SEPA for entry onto the register. This is work equates to 10-20 movements each year.

Incident and Emergency management

12. **A nuclear event** in Wales, or in England that may affect Wales, although extremely unlikely could have a widespread impact and very serious consequences. An incident and the response to it may last a sustained length of time and place great strain on our resources and those of our partners such as the emergency services and the Environment Agency. The latter provide us with 24/7 radiation incident response capability through their Radioactive Substances Regulation Duty Tactical Manager and Duty Nuclear Specialist arrangements. As with conventional incidents, radiation incident arrangements in Wales are led by the Incidents and Emergencies team in National Services Directorate.

13. **Non-nuclear events** - there have been a number of fatalities worldwide as well as radioactive contamination of the environment and metal reprocessing, mainly through people stealing or losing radioactive sources. This happened at a UK steel works, leading to the European Commission tightening controls on high-hazard sources in 2006. Subsequently the International Atomic Energy Agency restricted export of sources on counter-terrorism grounds. All of this is reflected within our permits and work.

Our Current Working Arrangements

14. The following paragraphs set out how we are currently organised to deliver the above responsibilities.

Our Service Level Agreement with the Environment Agency

15. When NRW was created an enduring Service Level Agreement (SLA) was established with the EA to provide the technical capability and resilience that was required to deliver our statutory nuclear responsibilities. In addition to the advice and guidance from nuclear specialists, the SLA includes a number of main services:
- Delivery of compliance work to meet the permit requirements of disposals of radioactive waste on and from nuclear licensed sites on behalf of NRW. This includes day to day regulation of the nuclear permit, detailed technical site audits/inspections and high level scrutiny of the nuclear site operations. The knowledge and expertise required to undertake this work cannot be underestimated with each site having a nominated EA Nuclear Site Inspector who acts as our agent, maintaining an NRW warrant to do so.
 - Delivery of technical support and advice in relation to the environmental permitting of nuclear facilities in Wales. This includes supporting pre-application advice to developers through to providing technical advice and opinion to support our determination of those permits.
 - Undertaking radiological monitoring of the environment around Wales on behalf of NRW. This is part of an extensive UK wide sampling regime providing data and information on the impact of the global nuclear industry on environmental and public health in the UK. They confer with our specialists regularly, providing data trend analysis which are published in a multi-regulator report each year as required by WG. This report is called Radioactivity in the Environment (RIFE) and is jointly badged by us with the EA, SEPA, NIEA and Food Standards Agency.
 - Providing 24/7 radiation incident response capability and expertise required during a nuclear incident and helping us to respond to incidents and emergencies involving radioactive substances.

NRW Organisational Arrangements

16. **Knowledge, Strategy and Planning Directorate** provides, through the Radioactivity and Industry Regulation Group (in the Business Regulation and Economics Department), strategic engagement at company level with nuclear sites in Wales, with Welsh Government and also with other nuclear stakeholders such as the Nuclear Decommissioning Authority and the Office for Nuclear Regulation. Further details are in Annex 2. There are two radioactive substances specialists who lead the nuclear and non-nuclear work respectively.
17. **Operations Directorate** - the staff involved are split broadly into four groups: nuclear regulation, non-nuclear regulation, international waste shipments and the nuclear new build programme. As indicated, direct regulation at each nuclear licensed facility is carried out by the EA. However, site interactions are led by the relevant Area place based Team Leader for industrial regulation, including compliance and inspection for any 'conventional' EPR permits.
18. Non-nuclear regulation, including HASS assessments, are carried out by six staff across Wales who use 10% of their time on this work area, one of whom acts as the Wales lead. Any movements of radioactive wastes, including used radioactive sources, are managed through our National Waste Audit Team.
19. The work to develop a new nuclear power station at Wylfa is delivered through a Programme Team based in North Area. This is a multi-disciplinary team covering the various aspects required for pre-planning and pre-permit application including communication. Led by the Energy Island Programme Manager the component skills are drawn in on an as needs basis, drawing from all Directorates within NRW. NRW have secured financial agreement with the developer to support our engagement in the project. Currently 10 full time staff are engaged in the project with further technical support from within the business. This will increase as we move towards permit and planning submission phase in late 2016 early 2017.
20. **National Services Directorate** - Typically each year NRW receives around 70 applications, from a range of different organisations, to use the various non-nuclear radioactive source types. This work is done by the Regulated Industry permitting team. They assess applications for new permits and changes to existing permits; as well as dealing with the transfer and surrender of permits where the original holder is no longer the keeper of the radioactive source.

Key Government Policy Areas

21. The following outlines the 3 government policy areas that will affect NRW in the future.

New Nuclear Build Programme

Background

22. The UK established the world's first civil nuclear programme by opening the Calder Hall nuclear power station at Windscale (Sellafield), Cumbria in 1956. The most recent station built in the UK was Sizewell in 1995. As such, the UK

fleet is aging with many sites closing during the next decade. As already indicated, Trawsfynydd stopped generating power in 1990 with Wylfa A finishing at the end of 2015.

23. Nuclear power only contributes just over 10% of the UK's electricity supply. The UK Government has looked to balance energy supply from secure and sustainable sources and it launched plans in 2010 through the Energy Act to construct up to eight new nuclear power plants. The process of securing the necessary financial resource to build and operate a new station has been significant and the UK Government has spent considerable effort to identify private investors. Support for new nuclear power is not universally held in the UK with the Scottish Government being opposed and therefore no sites are planned in Scotland.

Wylfa Newydd

25. The UK Government's review of possible locations identified one acceptable site in Wales for this technology. They proposed that a new station be located next to the existing station at Wylfa (Cemaes Bay). The company planning to develop the Wylfa Newydd station on Anglesey is Horizon Nuclear Power Ltd, a subsidiary of Hitachi Ltd. Hitachi itself is in partnership with GE Nuclear and together they form Hitachi-GE who have submitted a technology design for the UK. .
26. The reactor design proposed for Wylfa Newydd is the Advanced Boiling Water Reactor (ABWR) which is new to the UK. Hitachi-GE have designed and built ABWRs in Japan previously. The design is subject to detailed assessment to check it is fit for purpose and acceptable in the UK. This takes around 4 years and is entitled Generic Design Assessment (GDA). GDA is a joint process between the Office for Nuclear Regulation and the EA which assesses the new nuclear power station designs. It allows the safety, security and environmental implications of new reactor designs to be considered, separately from applications to build them at specific sites. Our role is to participate in this decision making process and also to lead on engagement in Wales. If the regulators are satisfied that the design is acceptable, a Statement of Design Acceptability (SODA) is issued. The work on the design programme has increased significantly during 2015, as information on environmental aspects has become available. We anticipate further increases in workload with key project milestones in 2016, when the design is expected to be formally submitted to the NRW, EA and ONR for assessment. In October 2016 NRW and EA will consult on our draft GDA decision.
27. Horizon Nuclear Power Ltd will also need to submit applications for environmental permits for both radioactive substance use & discharge and the conventional permits for combustion and water discharges. Permits will be required for both the construction and the operational phases. Horizon Nuclear Power Ltd are planning to start enabling works in 2017, early construction in 2019 and an operating station generating power by 2025.
28. A further permission is also needed from the EU where the potential impact on neighbouring Member States of the future radioactive waste disposals from a facility is assessed. Following submission of the required information by

DECC on behalf of the Member State, the process takes a minimum of six months.

29. We can recover costs for both the design assessment and permit work streams. We have a charging agreement between us and Horizon Nuclear Power Ltd for the permit programme in place, and are close to finalising the financial agreement with Hitachi-GE for our work in the design phase. We sit on the overarching new nuclear build programme board chaired by the EA. We also have an internal Energy Island Programme board providing governance for this the Wylfa Newydd development.
30. Working jointly with EA and ONR we have secured a Sciencewise funded project to identify how consultations for very technology focussed assessment, such as the GDA, could be improved. It has proven a very informative process, providing useful outputs for consideration when planning our GDA consultation scheduled for October 2016. The lessons learned will also be considered when NRW undertake their consultation for the site specific permit application for Wylfa Newydd during 2017.

Small Modular Reactors

- 30 The UK Government is also considering the potential for Small Modular Reactors (SMRs) in the UK. These are in essence similar to those used on the nuclear submarine fleet, having a much smaller size and scale. This could offer the potential of a Welsh site or sites hosting such a reactor. They are much quicker to build and much less costly than the existing approach, although generating less electricity. Due to their smaller size they may be able to operate with less ready access to large volumes of water making inland locations possible. To date there have been no formal design submissions for this type of reactor in the UK.

Geological Disposal Facility

31. Dealing with radioactive waste from civil and/or military programmes has long been a very difficult and politically sensitive issue. The most harmful radioactive wastes, which cannot be treated or disposed using existing technologies, must be contained and isolated from humans and the environment for a very long time. Disposal of these wastes in engineered facilities, located deep underground in suitable geologic formations, has been seen worldwide as the most preferable solution. A number of countries around the world have made progress in this area, selecting appropriate locations for facilities, some of which are under construction. Although the UK has spent many decades conducting research into this issue, progress has been slow as the UK Government has been unable as yet to identify a suitable location for a Geological Disposal Facility (GDF) with community support.

Welsh Government Policy

32. The UK Government extensively reviewed its approach in 2014, issuing a White Paper amending the process for developing the GDF programme for England. Following this, WG sought to adopt a similar approach by calling for evidence, a public consultation and finally issuing a policy on the disposal of higher activity waste (HAW) using a deep engineered facility in May 2015. The GDF programme will now cover Wales and England in looking to identify a suitable location with a community willing to host a GDF. The community would need to accept both any disruption from the construction and the significant financial benefits the development would bring. In June 2015 WG issued a further consultation regarding its proposal for working with communities in the GDF programme.

Our position

33. We have responded to the various consultations supporting Welsh Governments direction of travel. Following the WG policy announcement, we expect our involvement to increase over the next decade. However, the programme to collect data, information and starting the search for a suitable location will in itself take a number of years. If a willing and suitable host community is identified, and once all the regulatory permissions are gained and a facility is constructed, a GDF will not be operational until at least 2040. If this was in Wales, we would need to work with WG to assess what further resource and capability NRW would need to deliver our responsibilities.

Next Steps and Risks

34. The main risks arising relate to maintenance of technical resilience and provision of suitable resource. Whilst the current SLA with the Environment Agency is enduring, they are under significant cost pressure and struggling to maintain their own technical resilience. This may lead to pressures in renegotiating the SLA in part or whole, possibly with the EA deciding to withdraw from the agreement with suitable notice leading to significant resource pressures.
35. Recruitment within related industries is increasing coupled with a raising of salary expectations. This has not been restricted to the private sector, although the advent of the new nuclear build programme has certainly fuelled this. The formation of the ONR, with a significant ongoing recruitment drive, has continued this trend through the public services. Current salaries with ONR start at £70k for an inspector and those in industry for suitably qualified and experienced people are higher again. This makes recruitment and retention of staff an ongoing risk to NRW.
36. The timetable for permitting the new nuclear power station on Anglesey is fast paced and highly dependent on the outcome of the GDA process. There is also a significant reliance on having sufficient suitable information from the applicant, Horizon Nuclear Power Ltd, to enable permitting decisions to be made in line with this timetable. Any delays to the programme are likely to

result in significant pressure being applied by the developers, due to the cost and importance of this development.

37. It is also likely that given the concerns of local residents, and others, in the development of new nuclear power stations that any decisions made by us will be subject to legal challenge. This is being managed by ensuring we have appropriately rigorous processes and methods in our permitting approach both internally and with our agents.
38. Policy changes by Welsh Government, highlighted above, may lead to the development of a GDF in Wales. Were this to occur there would be significant additional work required of us as a regulator. Whilst the existing SLA provides some flexibility to deal with this, there is a high potential of additional work being necessary within NRW. This was highlighted by the recent Committee on Radioactive Waste Management meeting in Cardiff.
39. The board may wish to consider what further resource or approaches may be necessary to deal with these workloads or if further requirements are placed on us by Welsh Government.

Financial Implications

40. We are able to recover the costs of permitting and compliance activities through a range of routes. For non-nuclear radioactive substances our work is paid for through permit application and annual subsistence fees. Nuclear sites are managed differently with costs being recovered directly on a time and materials basis using cost recovery agreements with the companies. These agreements cover all aspects of the work from pre-application through to compliance work. An agreement is in place with Horizon Nuclear Power Ltd and the agreement with Hitachi-GE Ltd is progressing.
41. Policy work in the area of Radioactivity is funded through Grant in Aid unless it directly relates to the executive delivery of the service. This is recoverable through fees and charges levied in line with HM Treasury rules.

Equality impact assessment (EqIA)

Not relevant

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Annex 1 - Radioactive Substances Explanation and Terminology

Annex 2 – Working with our Stakeholders