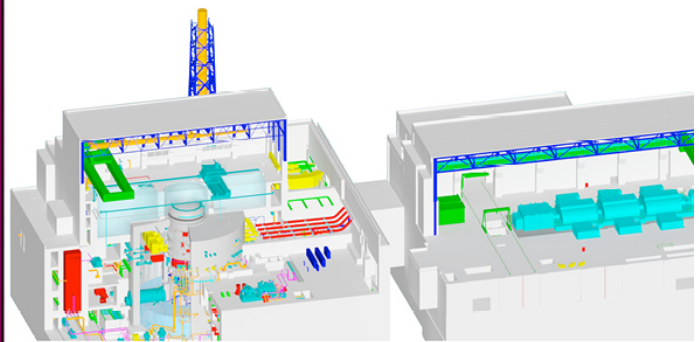




Environment
Agency
Asiantaeth yr
Amgylchedd

Asesiad dyluniad generig gorsafoedd pŵer niwclear

Adroddiad crynodeb ar asesiad cychwynol o Adweithydd Dŵr Berwedig
Uwch y DU Hitachi-GE Nuclear Energy, Ltd



Awst 2014

LIT 10002

Ni yw Asiantaeth yr Amgylchedd. Rydyn ni'n gwarchod ac yn gwella'r amgylchedd ac yn ei gwneud yn lle gwell i bobl a bywyd gwyllt.

Rydyn ni'n gweithio lle mae newidiadau amgylcheddol yn cael yr effaith fwyaf ar fywydau pobl. Rydyn ni'n lleihau peryglon i bobl ac eiddo o lifogydd, yn gwneud yn siŵr bod yna ddigon o ddŵr i bobl ac i fywyd gwyllt, yn gwarchod ac yn gwella ansawdd aer, tir a dŵr ac yn gosod y safonau amgylcheddol i ddiwydiant weithredu.

Mae gweithio i leihau newid hinsawdd a helpu pobl a bywyd gwyllt i addasu i'w ganlyniadau yn ganolog i bopeth rydyn ni'n ei wneud.

Allwn ni ddim gwneud hyn ein hunain. Rydyn ni'n gweithio gydag amrywiaeth eang o bartneriaid gan gynnwys llywodraeth, busnesau, awdurdodau lleol, asiantaethau eraill, grwpiau cymdeithas sifil a'r cymunedau rydyn ni'n eu gwasanaethu.

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Cedwir pob hawl. Gellir atgynhyrchu'r ddogfen hon gyda chaniatâd Asiantaeth yr Amgylchedd ymlaen llaw.

1. Cyflwyniad

Asiantaeth yr Amgylchedd yw prif reoleiddiwr amgylcheddol gorsafoedd pŵer niwclear yn Lloegr. Ein swyddogaeth fel rheoleiddiwr amgylcheddol yw sicrhau fod pobl a'r amgylchedd yn cael eu diogelu'n briodol pan mae gorsafoedd niwclear yn gweithredu'n arferol ac yn ystod cyfnodau eu hadeiladu, eu comisiynu a'u datgomisiynu. Mae ein gwaith yn cynnwys rheoleiddio gollyngiadau a gwaredu gwastraff ymbelydrol a gwastraff arall a ni sy'n gyfrifol hefyd am gynnal Asesiadau Dylunio Generig ar agweddau amgylcheddol dyluniadau sy'n cael eu cynnig ar gyfer adweithyddion niwclear newydd. Rydyn ni'n cydweithio'n agos gyda'n cydweithwyr yn y Swyddfa Rheoleiddio Niwclear wrth gynnal Asesiadau ac wrth reoleiddio unrhyw orsafoedd niwclear newydd ar ôl hynny. Mae cyfrifoldeb y Swyddfa honno'n cynnwys rheoleiddio diogelwch, diogeledd a deunyddiau niwclear ar safleoedd niwclear yn y DU.

Mae Cyfoeth Naturiol Cymru hefyd yn cydweithio'n agos ag Asiantaeth yr Amgylchedd ar Asesiadau Dylunio Generig er mwyn sicrhau y bydd canlyniad pob Asesiad ar ddyluniad adweithyddion, gan gynnwys Datganiad Derbynioldeb Dylunio neu Ddatganiad Derbynioldeb Dylunio interim a allai gael ei gyflwyno, yn berthnasol yng Nghymru yn ogystal ag yn Lloegr.

Mae Asesiad Dylunio Generig yn galluogi'r Swyddfa Rheoleiddio Niwclear ac Asiantaeth yr Amgylchedd i ddechrau asesu derbynioldeb agweddau diogelwch, diogeledd ac amgylcheddol dylunio gorsaf bŵer niwclear, ar lefel generig, cyn ei gymhwyso ar gyfer safleoedd penodol.

Mae'r adroddiad hwn yn crynhoi ein canfyddiadau cychwynnol o gyfnod asesu cyntaf Asesiad Dylunio Cyffredinol dylunio gorsaf bŵer niwclear Adweithydd Dŵr Berwedig Uwch y DU. Cyflwynwyd y dylunio gan Hitachi-GE Nuclear Energy, Ltd (Hitachi-GE). Crynodeb yw'r adroddiad hwn o adroddiad llawn asesiad cychwynnol Adweithydd Dŵr Berwedig Uwch y DU (Asiantaeth yr Amgylchedd 2014).

Cyhoeddodd Hitachi-GE ei gyflwyniad ar gyfer yr Asesiad Dylunio Cyffredinol er mwyn i'r cyhoedd gael ei weld a gallu cyflwyno sylwadau yn ei gylch. Mae'r rheoleiddwyr wedi ystyried y sylwadau perthnasol a dderbyniwyd hyd at 31 Mai 2014 a hefyd ymatebion Hitachi-GE i'r sylwadau hynny yn ystod eu hasesiadau cychwynnol. Bydd Hitachi-GE yn ystyried sylwadau a dderbyniwyd ar ôl 31 Mai yn ystod y cyfnod asesu manwl nesaf.

Rydyn ni'n archwilio, yn ein hasesiad cychwynnol, gyflwyniad Hitachi-GE ar lefel amlinellol. Y bwriad yw canfod a fyddwn ni angen rhagor o wybodaeth, a oes yna unrhyw beth sy'n amlwg yn annerbyniol ac a yw'n debyg y bydd angen newidiadau sylweddol i'r dylunio.

2. Y Prif Ganfyddiadau

: Rydyn ni wedi asesu nifer o feysedd a chrynodeb yw hyn o'n prif ganfyddiadau:

Systemau rheoli ansawdd: Mae gan Hitachi-GE system rheoli ansawdd sydd â thystysgrif ISO 9001:2008 ac mae wedi datblygu trefniadau system reoli benodol ar gyfer y prosiect Asesiad Dylunio Generig. Rydyn ni'n fodlon fod Hitachi-GE wedi datblygu a gweithredu system reoli ansawdd addas ar gyfer y cyfnod hwn o'r prosiect

- **Disgrifiad** generig o'r safle. Mae'r safle generig sy'n cael ei disgrifio gan Hitachi-GE yn cynnwys manylion y mesurau meteorolegol a hydrograffegol a ragdybir a fyddai'n effeithio ar wasgariad gollyngiadau, ar leoedd lle mae pobl yn byw a bwyd yn cael ei gynhyrchu, sy'n cael eu defnyddio yn yr asesiad radiolegol.
- **Effeithiau gollyngiadau radiolegol:** Mae effeithiau radiolegol Adweithydd Dŵr Berwedig Uwch y DU yn llai na'r cyfyngiadau ar ffynonellau o ddôs 300 $\mu\text{Sv/y}$ ar gyfer pobl ac yn llai na'r dôs meini prawf ar gyfer bywyd gwyllt o 10 $\mu\text{Gy/h}$. Seiliwyd cyfrifiadau'r dosau ar ragdybiaethau ynghylch gollyngiadau nwyon a hylifau ac ar y terfynau arfaethedig ar y gollyngiadau cysylltiedig sy'n cael eu cynnig gan Hitachi-GE. Yn seiliedig ar yr wybodaeth sydd i law ar hyn o

bryd, mae'n debyg na fyddai'r gollyngiadau ymbelydrol yn uwch na rhai mewn gorsafoedd niwclear tebyg.

- **Rheoli gwastraff ymbelydrol:** Cafodd pob ffynhonnell debygol o wastraff ymbelydrol a phob cynllun rheoli a gwaredu dichonadwy eu nodi ar gyfer pob ffrwd o wastraff. Rydyn ni'n fodlon fod yr amcangyfrifon o wastraff ymbelydrol soled o Adweithydd Dŵr Berwedig Uwch y DU yn realistig, ond byddwn angen rhagor o wybodaeth ynghylch rhai mathau o wastraff ar gyfer yr asesiad manwl.
- **Technegau gorau sydd ar gael :** Mae Hitachi-GE yn symud ymlaen i ddangos y bydd ei ddyluniad o Adweithydd Dŵr Berwedig Uwch y DU yn defnyddio'r technegau gorau sydd ar gael i amddiffyn yr amgylchedd. Fodd bynnag, newydd gychwyn y mae'r asesiad a bydd gofyn cael tystiolaeth bellach ar gyfer yr asesiad manwl.
- **Gwastraff llosgadwy:** Does yna ddim digon o wybodaeth ynghylch symiau a nodweddion gwastraff llosgadwy ymbelydrol ac anymbelydrol. Rydyn ni wedi gofyn am ragor o wybodaeth ar gyfer ein hasesiad manwl.
- **Monitro gollyngiadau a gwarediadau:** Does yna ddim digon o wybodaeth i ni benderfynu a yw cynigion Hitachi-GE ar gyfer mesur ac asesu gollyngiadau a gwarediadau'n dderbyniol. Byddwn angen rhagor o wybodaeth ar gyfer ein hasesiad manwl.
- **Rheoliadau amgylcheddol eraill:** Bydd yr Adweithydd Dŵr Berwedig Uwch y DU yn cael ei oeri'n uniongyrchol gan ddŵr y môr. Byddwn angen rhagor o wybodaeth ynghylch y trefniadau, gan gynnwys systemau atal pysgod, i wneud yn siŵr fod bywyd y môr yn cael ei ddiogelu ddigon. Nid yw'r cyflwyniad yn cynnwys digon o wybodaeth ynghylch y gollyngiadau anymbelydrol arfaethedig i ddyfroedd yr wyneb, gan gynnwys gollyngiadau gwres. Gofynnwyd am ragor o wybodaeth ynghylch hyn ac ynghylch y darpariaethau llosgi y bwriedir eu sefydlu. Mae'r cyflwyniad yn datgan na fydd yna unrhyw ollyngiadau i ddŵr daear. Mae'r cyflwyniad hefyd yn datgan na fwriedir cael llosgydd ar y safle. Ni chyflwynwyd unrhyw wybodaeth ynghylch faint o unrhyw sylweddau peryglus a fydd yn cael ei gadw ar y safle. Bydd angen yr wybodaeth ar gyfer yr asesiad manwl.

Mae Hitachi-GE wedi ymrwmo i ddarparu rhagor o wybodaeth ymhob maes lle mae ei angen yn ystod y cyfnod asesiad manwl.

3. Casgliadau

Yn ystod y cyfnod cychwynol yr Asesiad Dyluniad Generig, archwiliwyd y systemau rheoli a ddefnyddiwyd ar gyfer cynhyrchu'r cyflwyniad ac effeithiau'r gollyngiadau ymbelydrol arfaethedig.

Roedd ein hasesiad hefyd yn ystyried a oedd cyflwyniad Hitachi-GE ar gyfer Adweithydd Dŵr Berwedig Uwch y DU yn cynnwys unrhyw beth a oedd yn amlwg yn annerbyniol ac a allai, felly, olygu fod angen unrhyw newidiadau arwyddocaol yn y dyluniad. Rydyn ni hefyd wedi asesu a oes yna ddigon o wybodaeth ar gyfer y cyfnod asesiad manwl.

Casgliadau cyffredinol ein hasesiad cychwynol ar gyfer dyluniad gorsaf bŵer niwclear gydag Adweithydd Dŵr Berwedig Uwch y DU yw:

- Nid yw'r cyflwyniad yn talu digon o sylw i'r holl wybodaeth rydyn ni ei angen (fel y gwelir yn ein dogfen proses a gwybodaeth (Asiantaeth yr Amgylchedd, 2013)). Mae Hitachi-GE wedi ymrwmo i ddarparu'r holl wybodaeth sydd ei angen, a hynny mewn pryd, yn amodol ar fod yr wybodaeth o ansawdd ddigon da, i ni allu cadw at ein targed dangosol o bedair blynedd ar gyfer cwblhau Asesiad Dyluniad Generig ystyrlon.
- Dydyn ni ddim, hyd yma, wedi canfod unrhyw beth sy'n cael ei drafod yn y cyflwyniad sy'n amlwg yn annerbyniol.
- Dydyn ni ddim, hyd yma, wedi canfod unrhyw beth a allai olygu newidiadau sylweddol yn y dyluniad.
- Mae gan Hitachi-GE system reoli addas i reoli cynnwys a chywirdeb yr wybodaeth y mae'n ei gyflwyno ar gyfer yr Asesiad Dyluniad Generig.

- Byddai effaith blynyddol ymbelydredd o ddyluniad Adweithydd Dŵr Berwedig Uwch y DU ar bobl yn is na'r cyfyngiad yn y DU o unrhyw ffynhonnell newydd, sengl.
- Yn seiliedig ar yr wybodaeth sydd yn ein meddiant ar hyn o bryd, mae'n debyg na fyddai'r gollyngiadau ymbelydrol yn uwch na rhai o orsafoedd niwclear tebyg.
- Mae'r disgrifiad safle generig yn gyson, yn fras, gyda'r safloedd arfordirol a allai fod yn addas ac a nodwyd yn y datganiad polisi niwclear cenedlaethol (Senedd y DU, 2011). .

Seilir y casgliadau ar ein hasesiad cychwynnol. Efallai y bydd rhagor o gasgliadau, neu rai wedi'u newid, yn cael eu datblygu unwaith y bydd Hitachi-GE wedi cyflwyno'r holl wybodaeth sydd ei angen ac ar ôl i ni gynnal eich hasesiad manwl.

Dim ond pan fyddwn ni'n fodlon fod y rheoleiddwyr a Hitachi-GE yn barod y byddwn ni'n symud ymlaen i gynnal yr asesiad manwl. Rydyn ni'n gobeithio cychwyn ar yr asesiad manwl fis Medi 2014 a bydd yn cymryd tua 18 mis.

Ar gais y rheoleiddwyr, mae Hitachi-GE wedi sefydlu 'proses sylwadau' sy'n galluogi pobl i weld a chyflwyno sylwadau ar ei gyflwyniad ar gyfer yr Asesiad Dyluniad Generig (http://www.hitachi-hqne-uk-abwr.co.uk/make_a_comment.html).

Cyfeiriadau

Cyfeiriad	Awdur / Cyhoeddiad / Gwefan
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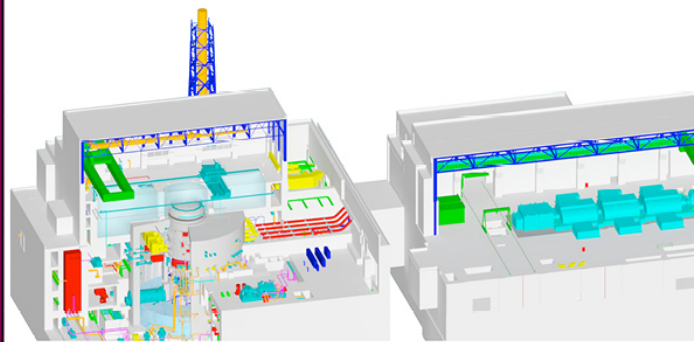
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Generic design assessment of nuclear power stations

Summary report on initial assessment of Hitachi-GE Nuclear Energy, Ltd's UK Advanced Boiling Water Reactor



August 2014

LIT 10002

We are the Environment Agency. We protect and improve the environment and make it a better place for people and wildlife.

We operate at the place where environmental change has its greatest impact on people's lives. We reduce the risks to people and properties from flooding; make sure there is enough water for people and wildlife; protect and improve air, land and water quality and apply the environmental standards within which industry can operate.

Acting to reduce climate change and helping people and wildlife adapt to its consequences are at the heart of all that we do.

We cannot do this alone. We work closely with a wide range of partners including government, business, local authorities, other agencies, civil society groups and the communities we serve.

Published by:

Environment Agency
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Bristol BS1 5AH
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1. Introduction

The Environment Agency is the principal environmental regulator of nuclear power stations in England. Our role as environmental regulator is to ensure that people and the environment are properly protected during normal operation of a nuclear power station and during construction, commissioning and decommissioning. Our work includes regulating discharges and disposals of radioactive and other wastes and we are responsible for carrying out Generic Design Assessment (GDA) for environmental aspects of potential new reactor designs. We work closely throughout GDA, and in the subsequent regulation of any new nuclear power stations, with our colleagues in the Office for Nuclear Regulation (ONR). ONR's responsibilities include regulating safety, security, and nuclear material safeguards at nuclear sites in the UK.

Natural Resources Wales (NRW) is also working closely with the Environment Agency on GDA to ensure that the outcome of the GDA for each reactor design, including any Statement of Design Acceptability (SoDA) or interim Statement of Design Acceptability (iSoDA) that may be issued, is applicable in both England and Wales.

GDA enables ONR and the Environment Agency to begin assessing the acceptability of safety, security and environmental aspects of a nuclear power station design, at a generic level, before site-specific applications are made.

This report summarises our initial findings from the first assessment stage of GDA for the UK Advanced Boiling Water Reactor (ABWR) nuclear power station design. This design was submitted by Hitachi-GE Nuclear Energy, Ltd (Hitachi-GE). This report is a summary of the full report of the initial assessment for the UK ABWR (Environment Agency 2014).

Hitachi-GE has published its GDA submission so that the public can view it and comment. The regulators have considered relevant comments received up to 31 May 2014 together with Hitachi-GE's responses to those comments during their initial assessments. They will consider comments received after 31 May 2014 during the next detailed assessment stage.

In our initial assessment we examine Hitachi-GE's submission at an outline level. The aim is to identify whether we require further information, if there are any matters that are obviously unacceptable, and if any significant design modifications are likely to be required.

2. Main findings

We assessed a range of areas and this is a summary of our main findings:

- **Quality management systems:** Hitachi-GE has a quality management system (QMS) which is certificated to ISO 9001:2008 and has developed specific management system arrangements for the GDA project. We are satisfied that Hitachi-GE has developed and implemented a suitable management system for this stage of the GDA project.
- **Generic site description:** The generic site described by Hitachi-GE includes details of assumed meteorological and hydrographical measures that would affect dispersion of discharges, and places where people live and food is produced, that are used in the radiological assessment.
- **Impact of radiological discharges:** The radiological impacts of the UK ABWR are below the source dose constraint of 300 $\mu\text{Sv}/\text{y}$ for humans, and below the dose criteria for wildlife of 10 $\mu\text{Gy}/\text{h}$. The dose calculations are based on estimated gaseous and liquid discharges and associated proposed discharge limits provided by Hitachi-GE. Based on the information we have at present, it is likely that radioactive discharges would not exceed those of comparable power stations.
- **Management of radioactive waste:** All likely sources of radioactive waste and feasible management and disposal plans have been identified for each waste stream. We are content

that estimates of solid radioactive waste from the UK ABWR are realistic, but we require more information on some waste for its detailed assessment.

- **Best available techniques (BAT):** Hitachi-GE is making progress in demonstrating that its UK ABWR design will use the best available techniques to protect the environment. However, the assessment is at an early stage and further evidence is required for detailed assessment.
- **Combustible waste:** There is not enough information on quantities and characteristics for both radioactive and non-radioactive combustible waste. We have requested more information for our detailed assessment.
- **Monitoring of discharges and disposals:** There is not enough information for us to conclude whether Hitachi-GE's proposals for measuring and assessing discharges and disposals of radioactive waste are acceptable. We require more information for our detailed assessment.
- **Other environmental regulations:** The UK ABWR will use direct seawater cooling. More information is needed on arrangements, including fish deterrent systems, to make sure that marine life is adequately protected. There is not enough information provided in the submission on proposed non-radioactive discharges to surface waters, including thermal discharges. More information has been requested on this, and on the proposed combustion plant. The submission states that there will be no discharges to groundwater. The submission also states that no on-site incinerator is planned. No information has been provided on the quantities of any dangerous substances that will be stored on site. This information is needed for the detailed assessment.

For all of the areas where we require further information, Hitachi-GE has committed to providing this during our detailed assessment stage.

3. Conclusions

In this initial assessment of GDA we examined the management systems used for producing the submission and the impact of the proposed radioactive discharges.

Our assessment also considered whether Hitachi-GE's submission for the UK ABWR contained any matters that are obviously unacceptable and so whether any significant design modifications might be needed. We also assessed whether there was enough information to carry out the detailed assessment stage.

The overall conclusions of our initial assessment for the UK ABWR nuclear power station design are:

- The submission does not adequately address all of our information requirements (as set out in our process and information document (P&ID) (Environment Agency, 2013)). Hitachi-GE has committed to providing the required information on a timescale that, subject to the information being of adequate quality, should enable us to maintain our indicative target of four years for completing a meaningful GDA.
- We have not at this stage identified any matters addressed by the submission that are obviously unacceptable.
- We have not at this stage identified any significant design modifications that are likely to be required.
- Hitachi-GE has an appropriate management system in place to control the content and accuracy of the information it provides for GDA.
- The annual radiation impact of the UK ABWR design on people would be below the UK constraint for any single new source.
- Based on the information we have at present, it is likely that radioactive discharges would not exceed those of comparable power stations.
- The generic site description is broadly consistent with the potentially suitable coastal sites identified in the nuclear national policy statement (UK Parliament, 2011).

These conclusions are based on our initial assessment. Further or modified conclusions may be developed once Hitachi-GE has provided all the required information and we have carried out our detailed assessment.

We will only proceed to detailed assessment of the UK ABWR and subsequent consultation once we are satisfied that the regulators and Hitachi-GE are ready to do so. This detailed assessment is expected to commence in September 2014 and take approximately 18 months.

At the regulators' request, Hitachi-GE has implemented a 'comments process' that enables people to view and comment on the GDA submission it has made (http://www.hitachi-hgne-uk-abwr.co.uk/make_a_comment.html).

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