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| ONR Technical Assessment Guide  Assessment for the delicensing of a nuclear licenced site |



ONR Technical Assessment Guide (TAG)

Assessment for the delicensing of a nuclear licenced site

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# Introduction

1. ONR has established its [Safety Assessment Principles](http://www.onr.org.uk/saps/saps2014.pdf) (SAPs) [1] which apply to the assessment by ONR specialist inspectors of safety cases for nuclear facilities that may be operated by potential licensees, existing licensees, or other dutyholders. The principles presented in the SAPs are supported by a suite of guides to further assist ONR’s inspectors in their technical assessment work in support of making regulatory judgements and decisions. This technical assessment guide (TAG) is one of these guides.
2. The final stage of the lifecycle of a nuclear licenced site (NLS) is for it to be varied or revoked in all or part; this is referred to as delicensing. This is achievable via the licensee sufficiently demonstrating to ONR that the NLS (or part of) to be delicensed has met the criteria of no danger from ionising radiations from anything on that part of the site (here after referred to as ‘no danger’), as specified in the Nuclear Installations Act 1965 (as amended) (NIA65) [2]. This TAG provides guidance to inspectors on the assessment of a delicensing application against the ‘no danger’ criteria.
3. In 2005, ONR (known then as the Nuclear Installations Inspectorate and was part of the Health and Safety Executive (HSE)) established and published an interpretation of ‘no danger’ called ‘Criterion for Delicensing Nuclear Sites’ [3]. In 2008, further guidance was written to assist inspectors on the interpretation and implementation of the criterion of no danger and delicensing NLSs [4]. In 2013, The Energy Act 2013 [5] created ONR as the appropriate national authority in relation to NLS (as defined in NIA65 [2]). ONR adopted this interpretation of no danger without making any substantive changes. In 2021 these documents had minor updates to reflect changes in legislation and became NS-PER-POL-001 [6] and NS-PER-GD-019 [7]. In 2024 following further updates these documents were amalgamated into this TAG.

# Purpose and scope

1. The aim of this document is to provide guidance to ONR inspectors, principally radiation protection specialist inspectors, when undertaking regulatory judgement, regarding the adequacy of a licensee’s delicensing application.
2. It should be noted that under NIA65 [2] a nuclear site license can either:

* be surrendered, or
* be revoked, or
* be varied (this could be part or all of the site).

Further information on the first two options are provided within NS-PER-PROC-004 [8] whilst the third option is covered within this TAG.

1. This guidance is to cover all facilities and areas within the NLS boundary. Parts of site infrastructure which are located off the NLS (for example waste discharge pipes) are out of scope of this guidance.
2. Authorised defence sites (such as His Majesty’s Naval Base Clyde) are out of scope of this guidance. For Authorised defence sites, guidance is to be sought from the Defence Nuclear Safety Regulator (DNSR).
3. As with all guidance, inspectors should use their judgement and discretion in the depth and scope to which they apply the guidance provided in this TAG. Guidance on the delicensing process is provided in NS-PER-PROC-004 [8].

# Relationship to licence and other relevant legislation

## Licence Conditions

1. The NIA65 [2] requires ONR to attach to the site licence such conditions as may appear to be necessary or desirable in the interests of safety. However, there are no specific Licence Condition (LC) which relate to delicensing.
2. If the licensee is delicensing the whole NLS site, LCs will no longer be applicable. If the licensee is to delicense only part of the NLS site, then compliance arrangements for all LCs are likely to be affected for the remaining NLS site.

## The Energy Act 2023 (as amended)

1. The no danger criteria requires sites to be fully cleaned up/remediated before they can be delicensed. Although yet to be given a commencement date, the Energy Act 2023 (TEA23) [9] amended NIA65 to provide additional criteria that allows earlier delicensing when sites are in the final stages of decommissioning and the remaining hazards and risks are such that a nuclear site licence is no longer required and, after delicensing, the site can be adequately regulated by the HSE and the relevant environment agency. These new criteria (referred to in NIA65 as “Applicable Conditions”) are based on Organisation for Economic Co-operation (OECD) criteria for when nuclear third-party liability is no longer required. This TAG provides guidance to inspectors on the assessment of a delicensing application against the current ‘no danger’ criteria and will be revised in line with a future UK Government decision on a commencement date for the amendments.

## Nuclear Installations Act 1965 (as amended)

1. Within NIA65 sections 3(12) allows the appropriate national authority from time to time vary a nuclear site licence by excluding from it any part of the licensed site:

* which the licensee no longer need for any use requiring such a license, and
* with respect to which the appropriate national authroity is satisifed that there is no danger from ionising radiation from anything on that part of the site.

1. Within the NIA65 section 3(13), there is a requirement for ONR to consult with the appropriate environment authority[[1]](#footnote-2) when delicensing.
2. Under NIA65 section 5(15)(a) there is also a requirement for the appropriate national authority to give notice in writing to the licensee that in the authority's opinion there has ceased to be any danger from ionising radiations from anything on the site or, as the case may be, on the part of it in question. This is in relation to the revocation and surrender of licenses. Further information on this is provided within NS-PER-PROC-004 [8].

## The Nuclear Installations Regulations 1971

1. Section 3 of The Nuclear Installations Regulations 1971 (NIR71) [10] provides a list of prescribed installations which are required to have a nuclear site licence as stated within NIA65.

## The Ionising Radiations Regulations 2017

1. The Ionising Radiations Regulations 2017 (IRR17) and their associated Approved Code of Practice (ACoP) [11] and guidance, provide the framework for the protection of people from ionising radiation arising from work with ionising radiation. The basic requirement is that exposure to ionising radiations will be kept below dose limits and restricted So Far As Is Reasonably Practicable (SFAIRP).
2. It should be noted that for any relevant part which is delicensed from the NLS, exemptions under IRR17 for registration, notification and consent will no longer be applicable. Examples are IRR17 Regulation 6(2)(c) where once a nuclear installation is removed from the nuclear site licence it is no longer legally a nuclear installation and this exemption (for operation or decommissioning a nuclear installation) no longer applies. Any further decommissioning involving work with ionising radiations would require registration. Another example is IRR17 Regulation 7(1)(h) will become applicable for any operation, decommissioning or closure of any facility for the long-term storage or disposal of radioactive waste. Further information on this is available on the ONR website.

## The Environmental Permitting (England and Wales) Regulations 2016 (as amended) and The Environmental Authorisations (Scotland) Regulations 2018

1. The Environmental Permitting (England and Wales) Regulations 2016 (as amended) (EPR16) [12]/The Environmental Authorisations (Scotland) Regulations 2018 (EASR18) [13] allow the relevant environment authority to grant environmental permits to the licensees for radioactive waste disposals on and from NLS in England and Wales, whilst in Scotland this includes management of radioactive waste as well as disposal on a NLS.   
   The requirements of these regulations will continue to apply after delicensing of a NLS.

## Health and Safety at Work etc. Act 1974 (as amended)

1. The Health and Safety at Work etc. Act 1974 (as amended) (HSWA74) [14] places a duty on the site licensee, in common with all other employers, to conduct their undertaking in such a way as to ensure, SFAIRP, that their employees and persons not in their employment who may be affected are not exposed to risks to their health or safety. The requirements of HSWA74 and relevant regulations under section 15 continue to apply after delicensing of a NLS.

# Relationship to Safety Assessment Principles, WENRA Reference Levels, and IAEA Safety Standards and Guides

## SAPs

1. The SAPs [1] can be used to judge whether dutyholder’s safety case has satisfactorily demonstrated that the requirements of the law can be or have been met. There are a number of SAPs [1] which should be considered when undertaking a delicensing assessment to guide regulatory decision making. The following principles are of relevance to this TAG:

* FP.3 - Protection must be optimised to provide the highest level of safety that is reasonably practicable.
* FP.4 – Dutyholders must demonstrate effective understanding and control of the hazards posed by a site or facility through a comprehensive and systematic process of safety assessment.
* FP.5 – Measures for controlling radiation risks must ensure that no individual bears an unacceptable risk of harm.
* FP.8 – People, present and future, must be adequately protected against radiation risks.
* MS.3 – Decisions made at all levels in the organisation affecting safety should be informed, rational, objective, transparent and prudent.
* SC.3 – For each lifecycle stage, control of the hazard should be demonstrated by a valid safety case that takes into account the implications from previous stages and for future stages.
* RP.5 – Suitable and sufficient arrangements for decontaminating people, the facility, its plant and equipment should be provided.
* RP.7 – The dutyholder should establish a hierarchy of control measures to optimise protection in accordance with IRR17.
* NT.3 – When comparing the estimates submitted with the targets, inspectors should take account of the assumptions and limitations of the analysis used.
* RL.1 – A strategy should be produced for the control and remediation of any radioactively contaminated land on the site.
* RL.2 – Steps should be undertaken to identify any areas of radioactively contaminated land or adjacent to the site.
* RL.3 – Arrangements should be in place to ensure that leaks and escapes giving rise to radioactive land contamination are promptly identified and controlled.
* RL.4 – Radioactively contaminated land should be characterised to facilitate its safe and effective control and remediation.
* RL.5 – Radiological surveys, investigation, monitoring and surveillance of radioactively contaminated land should be carried out such that its characterisation is kept up to date.
* RL.6 – A plan should be prepared and implemented for the safe control and remediation of radioactively contaminated land and should be subject to appropriate stakeholder engagement.

## WENRA Reference Levels

1. The objective of the Western European Nuclear Regulators Association (WENRA) harmonisation programme is to develop a common approach to nuclear safety in Europe by comparing national approaches to the application of International Atomic Energy Agency (IAEA) safety standards.
2. In relation to delicensing, the WENRA decommissioning safety reference levels report [15] under ‘License termination conditions’, has three reference levels, these are:

* DE-60: Before a facility or site can be released from regulatory control, the licensee shall perform a final survey to demonstrate that the end‐state, as approved by the regulatory body, has been met.
* DE-61: At the completion of decommissioning, the licensee shall not be relieved of responsibility for the facility or site unless the regulatory body has agreed.
* DE-62: In the case of restricted use the licensee shall provide a long-term impact assessment, an appropriate surveillance regime and any proposed land use restrictions.

## IAEA Safety Standards and Guides

### General Safety Requirements Part 3 - Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards

1. This document establishes the requirements for the protection of people and the environment from harmful effects of ionising radiation and for the safety of radiation sources. The following sections of General Safety Requirements Part 3 (GSR Part 3) [16] are relevant to the application of no danger from ionising radiation:

* Requirement 8: Exemption and Clearance states ‘The government or the regulatory body shall determine which practices or sources within practices are to be exempted from some or all of the requirements of these standards. The regulatory body shall approve which sources, including materials and objects within notified practices or authroized practices may be cleared from regulatory control’.
* Schedule I (Exemption and Clearance) provides definitions and the criteria for exemption and clearance. Table I.1 (Levels for exemption of moderate amounts of material without further consideration, exempt activity concentrations and exempt activities of radionuclides) provides information on moderate amount of material where either the total activity of an individual radionuclide present on the premises at any one time or the activity concentration as used in the practice does not exceed the applicable exemption level. Table I.2 (Levels for exemption of bulk amounts of solid material without further consideration and clearance of solid material without further consideration: activity concentrations of radionuclides of artificial origin) provides information on material in bulk amount for which the activity concentration of a given radionuclide of artificial origin used in the practice does not exceed the relevant value.

### General Safety Guide No.17 - Application of the Concept of Exemption

1. General Safety Guide No.17 (GSG17) [17] provides recommendations and guidance on the application of the GSR Part 3 [16] concept of exemption within the framework of planned exposure situations. In addition, the application of the exemption levels as stated within GSR Part 3 Schedule I.
2. It should be noted that this does not directly apply to the release of sites from regulatory control, however the application of the values in Schedule I of GSR Part 3 are defined in greater detail within this document which are used for the purposes of delicensing through the no danger from ionising radiation criteria.

### General Safety Guide No.18 - Application of the Concept of Clearance

1. GSG18 [18] provides recommendations and guidance on the application of the GSR Part 3 [16] concept of clearance for materials (including radioactive waste associated with planned activities), objects and buildings that are to be released from regulatory control. It also provides information on regulatory framework for clearance; the clearance process; the derivation of clearance levels; the application of clearance to solid materials, liquids and gases; and generic clearance and specific clearance using activity concentration and surface contamination clearance levels.
2. It should be noted that this does not directly apply to the release of the entire site from regulatory control (this is covered within section ‎4.3.6), however the methodology and approach used for clearance of buildings as well as surface contamination can be used.

### Specific Safety Guide No.47 - Decommissioning of Nuclear Power Plants, Research Reactors and Other Nuclear Fuel Cycle Facilities

1. Specific Safety Guide No.47 (SSG47) [19] provides guidance for regulatory bodies, licensees, technical support organisations and other interested parties on planning for decommissioning, conducting decommissioning actions, demonstrating completion of decommissioning and terminating the authorisation for decommissioning of facilities.
2. Section nine provides guidance of how the licensee should complete decommissioning activities on a site, how a regulatory body should verify the end state as well as termination for the authorisation for decommissioning.

### Specific Safety Guide No.49 - Decommissioning of Medical, Industrial and Research Facilities

1. SSG49 [20] provides guidance for regulatory bodies, licensees, owners, technical support organisations and other interested parties on meeting the requirements on planning for decommissioning, conducting decommissioning actions including characterization surveys, demonstrating completion of decommissioning and terminating the authorisation for decommissioning of medical, industrial and research facilities.
2. Section nine provides guidance of how the licensee should complete decommissioning activities on a site, how a regulatory body should verify the end state as well as termination for the authorisation for decommissioning.

### Safety Guide No.WS-G-5.1 – Release of Sites from Regulatory Control on Termination of Practice

1. WS-G-5.1 [21] provides guidance to the regulatory body as well as licensees on the release of sites or parts of sites from regulatory control after a practice has been terminated. Such release from regulatory control may require the clean-up of contaminated sites, which this guidance also provides information on. This only relates to radiological protection aspects.
2. Section two of this document states the dose criteria for restricted and un-restricted use of sites from regulatory control. Figure 1 provides an overview of this.

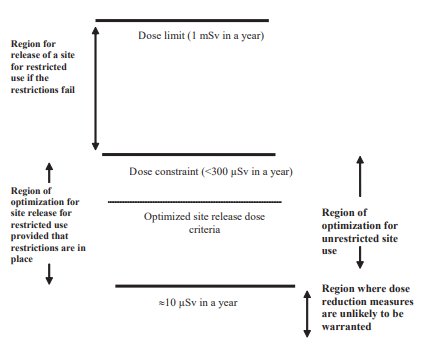


Figure 1 - Constrained optimisation and regions of effective dose for member of the critical group in the release of sites (source of data from [21])

1. It states that for unrestricted use of a site the effective dose to a member of the critical group[[2]](#footnote-3) should be below the dose constraint of 300 μSv per year. If the site has restrictions (ways to mitigate the dose) and they were to fail, then a critical group should not receive a dose greater than 1 mSv per year. A lower order of optimisation below which further expenditure on dose reduction is deemed not cost effective is set at 10 µSv per year (this is the level which no danger from ionising radiations criteria is interpreted at).
2. Defined end points are set out in section four, with examples of clean-up programme requirements within section five which includes monitoring, waste management, record keeping and post clean up (remediation) control.

# Advice to inspectors

1. For ONR to vary a NLS, NIA65 [2] section 3(12) requires that:

* “the licensee no longer need for any use requiring such a license, and
* with respect to which the appropriate national authority is satisfied that there is no danger from ionising radiation from anything on that part of the site”.

1. If the licensee can provide appropriate evidence to demonstrate that the licensee no longer need for any use requiring such a license and no danger from ionising radiation has been met, ONR may approve the delicensing application and follow the process as defined within NS-PER-PROC-004 [8].
2. Further information regarding overview of the delicensing application, the interpretation of the no danger and the technical assessment, is provided in the following sub‑sections. Further background information is provided within appendix one.

## Overview of delicensing application

### Characterisation and sampling

1. When a licensee chooses to delicense part or all the NLS, characterisation of the relevant part is required to:

* Determine the location and activity of remaining radiological sources/ contamination;
* Provide up to date information regarding the relevant part (for example history records): and
* Be used as evidence to demonstrate compliance against the ‘no danger’ criteria.

1. Characterisation can be achieved through several of the following methods:

* Review of appropriate records for the relevant part;
* Taking appropriate samples of the relevant part; and
* Radiation and contamination monitoring of the relevant part.

1. As a first step, the historical data for the relevant part should be reviewed to provide an initial scope of the potential radiological hazard to the relevant part from the land and buildings (including those buildings that have now been demolished that were previously on the relevant part). Information for the historical data can be acquired from [21]:

* aerial photographs
* survey records
* operating history
* incident records
* interview with personnel who worked at the relevant part, past and present

1. With regards to sampling and monitoring of the relevant part, the licensee should undertake a proportionate approach to generate adequate characterisation data to support claims and arguments for delicensing.   
   This means that if it is known that the relevant part to be delicensed is expected to be free from radiological contamination, a high-level sampling and monitoring programme should be undertaken to confirm the assumptions. If it is known the relevant part has radiological contamination or records are incomplete, a more detailed sampling and monitoring regime is required.
2. It is up to the licensee to choose the sampling and monitoring methodology to be used in the delicensing assessment. One approach that has been used is the Data Quality Objectives/Data Quality Assessment. Further information on this process is provided in appendix one.
3. The physical attributes of the relevant part to be delicensed determines the type of sampling to be required. This could involve but not limited to the following:

* ground surfaces
* building (including internal structures/building fabric)
* underground (including groundwater/fluvial)

1. For potential ground surfaces and underground contamination, the depth of sampling to be undertaken is on a case-by case basis, but a proportionate approach should be undertaken by the licensee. For example, if from the records it states a disused effluent pipework at 10 m below ground level, then it is reasonable to undertake samples in that area to below the disused effluent pipe. However, if sampling and characterisation has established that the pipework has leaked over a period of years, then further sampling will be required to determine the depth of the leak as well as confirming if it is still leaking.
2. For buildings remaining after delicensing, appropriate sampling would be on a case-by-case basis (for example, core samples, in situ radiometric methods) of each building. The licensee may need to take samples below the building to confirm if the ground underneath has been contaminated.
3. If there is a likelihood for underground contamination (including groundwater), then the sampling regime should potentially include sampling to aquifer depth/the water table. The sampling regime should extend away from the area of the source of the contamination consistent with the postulated source, pathway, receptor models used.
4. Where appropriate the possibility of off-site contamination via underground pathways, either current or reasonably foreseeable, should be factored into the assessment and discussed with the appropriate environment authority. Decisions on the depth of sampling required will to a great extent depend on the outcome of geological and hydrogeological investigation to identify possible transport mechanisms.
5. The above information for characterisation and sampling may already be available from the licensee, examples of where this information could be located are as follows (this is not an exhaustive list):

* compliance against relevant LCs (for example LC34 – Leakage and escape of radioactive material and radioactive waste, LC35 – Decommissioning)
* Site-Wide Environmental Safety Case (SWESC)
* Waste Management Plan (WMP)
* Environmental Management Plan[[3]](#footnote-4)

#### Background level subtraction

1. The natural background radiation level (including gamma from the ground and Naturally Occurring Radioactive Material (NORM) activity levels) prior to the operation of the NLS needs to be established. This could be from pre‑operational surveys or by inference from measurements from the surrounding area (for example a mile away from the site) that are remote from the impact of the operational discharges from the site but similar in geology. It should be noted that if the site has a history of using radioactive substances prior to licensing, any residual contamination, for example use of radioactive materials for their radioactive, fissile or fertile properties would not form part of the natural background radiation level and must be considered in the delicensing application.
2. The setting of the current baseline natural background radiation level should consider the impact that authorised discharges from the site under consideration, or other nearby sites, may have had. These would have been deemed to be material released from regulatory control[[4]](#footnote-5) and to present acceptable risks to the public under the standards current at the time of discharge. The licensee should not take into account unauthorised historic discharges from the site under consideration or other nearby sites when calculating the background level.
3. Appropriate natural background radiation levels present at a site need to be determined and justified as part of the assessment. The risk resulting from natural background radiation levels, including radon gas from sources not associated with practices that have taken place on the site should not be included in the assessment. In addition, the risk resulting from fallout from weapons testing or incident at other national or international plants   
   (for example, the Chernobyl accident) should also not be included in the delicensing assessment.

#### Non-radioactive contamination

1. Any contamination remaining on the site solely comprising non-radioactive contamination does not preclude delicensing under NIA65 [2].
2. Where radioactive contamination is co-located with non-radioactive contamination, consideration will need to be given to the risks associated with the presence of the non-radioactive contaminants, such as asbestos, when undertaking delicensing. Liaison with the appropriate environment authority and the Local Authority (LA) will be required.

### Use of technical support contractor

1. When assessing a licensee’s delicensing application, additional competent independent expertise (Technical Support Contractor (TSC)) may be used by ONR to provide independent assurance on the licensee’s site characterisation data and its interpretation. The intention of this is not to reproduce the licensee’s survey but to enable ONR to form a judgement about the adequacy of the licensee’s survey on a proportionate basis for validation and verification purposes.
2. The use of a TSC by ONR will be considered on a case-by-case basis. Aspects where a TSC may not be required by ONR are:

* The history file is appropriately detailed and provides all necessary information to understand what has occurred on the relevant part;
* The area to be delicensed has no history of work being undertaken which could have led to radioactive contamination, including that from any waste disposals, lay down area use, or storage of items that could have been contaminated;
* The initial sampling and monitoring surveys results from the licensee are indistinguishable from natural background in the relevant part to be delicensed;
* The methodology of the sampling and monitoring for the relevant part is considered suitable and sufficient and in line with relevant good practice;
* Confidence has been gained, where appropriate, from previous satisfactory delicensing applications by the licensee and that TSC validation or verification is not needed for this delicensing application; and
* The licensee uses UK Accreditation Services (UKAS) approved laboratories for assessing the sampling undertaken.

1. Although the above list is non-exhaustive, it shows that a TSC may not be required for certain aspects of a delicensing application. In any case, since contractor characterisation and ONR TSC activities usually occur concurrently, discussions with the licensee, and where appropriate their characterisation/remediation contractors, should be undertaken as early as practicable in the delicensing application regarding this matter.

### Involvement of other regulators

1. A statutory requirement of NIA65 [2], is for ONR to consult with the appropriate environment authority on the delicensing application; early engagement with these regulators regarding any delicensing application is advised.
2. It is up to the inspector to consult with the appropriate environment authority regarding the delicensing application for the following:

* Sharing of information and documentation;
* Knowledge management of the site from a regulator’s perspective;
* Discussion with the appropriate environment authority on the progress of the delicensing application; and
* Discussion with the appropriate environment authority on any significant technical issues arising from the application.

1. Depending on the relevant part to be delicensed, a joint readiness inspection with the appropriate environment authority may be appropriate, though this should be considered on a case-by-case basis.
2. Any radioactive contamination that has left the site via groundwater or other transport mechanisms and is not an authorised discharge is a regulatory matter for the LA and the appropriate environment authority (once delicensing has been completed). The LA may request advice from the appropriate environment authority or may ask them to carry out a detailed inspection on their behalf under the Radioactive Contaminated Land (RCL) regime (the Scottish Environment Protection Agency make determinations about what is and is not RCL, rather than the LA). This is not an issue for the delicensing assessment.
3. Although it is a statutory requirement to consult with the appropriate environment authority under NIA65 [2], there could be other interested regulators who should be consulted regarding the delicensing of a NLS.   
   For example, DNSR would be interested in a NLS where defence-related work is carried out and was to be delicensed. In addition, the Office for Road and Rail (ORR) would have an interest if a rail or road went through the relevant part to be delicensed. It should be confirmed with the site inspector of the NLS if other regulators apart from the appropriate environment authority have any interest regarding the delicensing application.
4. Discussions with the internal regulator for the NLS could be useful to gain regulatory intelligence and assurance, (for example on going activities on relevant part to be delicensed) regarding the progress of the licensee’s delicensing application.
5. Further information on the involvement of other regulators can be found in NS-PER-PROC-004 [8].

### Involvement of other ONR purposes

1. Although delicensing application covers nuclear safety, there are aspects which could affect the other ONR purposes (security, safeguards, transport and conventional health and safety).
2. Discussions with the relevant site lead inspectors for security, safeguards, transport and conventional health and safety for the NLS undertaking delicensing should be considered. This is to confirm if there are any significant issues which could affect the progress of the delicensing application as well as keeping them updated on the progress.
3. If aspects are identified which could affect the delicensing application, through discussion with the relevant site lead for the other ONR purposes, a discussion with the licensee should be undertaken to try and resolve any technical issues.

### Licensees agreements and assumptions for delicensing

1. It is considered good practice for the licensee to have a living document which records the common position of the stakeholders on various issues that arise during the lifetime of the delicensing project. This could include but not limited to:

* summary of work undertaken
* technical guidance
* changes to document since last issue
* arrangements in place (including governance of the process)
* justification for delicensing work to be undertaken

1. The inspector should only agree to a common position following an appropriate level of assessment and, where appropriate, consultation with the TSC and the appropriate environment authority.
2. This document should be regularly updated during routine meetings with all relevant stakeholders.

## Interpretation of ‘no danger’

1. Requiring a licensee to demonstrate ‘no danger’ cannot mean asking the licensee to demonstrate that the site is ‘completely safe’ as, since all materials contain low levels of naturally occurring radioactivity, this is not feasible, no matter how comprehensively a site is cleaned up and monitored. Since NIA65 [2] has always allowed for delicensing, it is reasonable to assume that government must have intended that sites, or parts of sites, should be capable, in some circumstances, of being delicensed with some residual and broadly acceptable level of risk within the concept of reducing risks SFAIRP. Therefore, in the opinion of ONR, once licensable activities have permanently ceased, and following rigorous radiological decontamination and remediation on site, it is acceptable for there to be a small but finite radiological hazard, whose further detection and reduction would be grossly disproportionate to effort and cost. However, the licensee must demonstrate that any residual radiological hazard will not pose a significant ongoing risk to any representative person, regardless of any reasonably foreseeable uses for the site at present and future.
2. The need to interpret ‘no danger’ is driven by the wording in the NIA65 [2]. Instead of a specific phrase such as “very low risk” which is not clear, an interpretation in terms of a numerical risk to human life is seen as the best option.
3. Based on existing published guidance[[5]](#footnote-6), an additional risk of death to an individual of one in a million per year is ‘broadly acceptable’ to society. Applying this to a NLS, any residual radioactivity above the average natural background, which can be demonstrated to pose a risk less than one in a million per year, would be acceptable. This criterion is the basis of ONR’s interpretation of ‘no danger’ for the purposes of NIA65 [2].
4. Within WS-G-5.1 [21] it states that ‘dose constraints should be applied prospectively to exposure from radioactive residues expected to remain in human habitats after the termination of a practice. The site dose release criteria should thus be based on an optimization of protection under this constraint, with account taken of the fact that optimization below the order of 10 μSv per year might not be warranted on radiological protection grounds.’ This level of dose broadly equates to the one in a million per year ‘no danger’ criterion as well as being consistent with other legislation and international advice relating to the radiological protection of the public.
5. Equating ‘no danger’ with this criterion is seen as a pragmatic approach to be compliant with NIA65 [2], as this could be perceived as an unachievable requirement without this criterion. It should be noted that the average risk of death in the UK from naturally occurring radioactivity is estimated to be around 1 in 7,700 per year[[6]](#footnote-7) .
6. If a licensee can demonstrate that ‘no danger’ has been met, the overarching requirements of the HSWA74 [14], which requires operators to ensure health and safety ‘SFAIRP (or, equivalently, that risks are reduced As Low As Reasonably Practicable (ALARP)) also apply. The expectation is the licensee can demonstrate it has also considered these overarching ALARP requirements. For example, no further low-cost clean-up activities be carried out[[7]](#footnote-8), if the licensee has demonstrated that residual risk has been reduced to less than one in a million.

## Assessment of ‘no danger’

1. Before delicensing can occur, the licensee must demonstrate to ONR that activities for which a licence is required (NIA65 section 1 [2] and NIR71 [10]) are no longer being conducted on the relevant part to be delicensed and no danger from ionising radiations remains.
2. Arrangements for the removal from the relevant part or shut down of all sources of ionising radiation (for example radiographic or calibration sources, accelerators, charge generators) that have the possibility of giving rise to dose or risk in excess of 10µSv a year, should be made prior to delicensing. Such sources of ionising radiation may be re-installed post delicensing in accordance with IRR17 [11], and EPR16 [12]/EASR18 [13], as long as they are not activities which require a nuclear stie license under NIA65 section 1 [2] or NIR71 [10] as well as following the procedures/arrangements stipulated by the relevant environment agency.
3. Inspectors need to consider the balance of risks for the removal or shut down of sources of ionising radiation against the actual and potential risks to employees and the public in doing so. Considerations may include for example:

* The need to do things safely, and not to do anything which increases risk if it can be avoided;
* The desirability of minimising the burden on licensees and avoiding unnecessary bureaucracy; and
* Can the sources be removed from site and returned (for example can it be demonstrated that their presence does not mask any other sources of radiation that may be present in the relevant part).

1. The licensee can put forward alternative proposals, although they have to satisfy the criteria previously stated.
2. A licensee’s application for delicensing of the relevant part will need to be supported as a minimum by aspects covered in section ‎5.1 and the following:

* The identification and appropriate characterisation of contaminated areas of the site, and areas where past operations, practices and incidents contributed significantly to radiation exposure (to include information of the significant radionuclides present). Details of the methods employed for their remediation and of the work to reduce levels of radioactive materials on the site to below level required to demonstrate compliance with the 10 µSv per year.
* Documentation, records and results of radiological surveys and analysis of samples taken on the site.
* An assessment of dose and risk to the public following delicensing, to demonstrate that any reasonably foreseeable future use[[8]](#footnote-9) the land presents ‘no danger’ of risks to the public in excess of one in a million of fatality per year. This will in general require the use of models to show that the measured quantities, Bq/g or Bq/cm2, of residual activity equate to risk values of less than one in a million per year.
* Methods by which the licensee will maintain adequate records and facilitate arrangements for the continued keeping of records (for example in a relevant public register). Retention of any records for a period required under the licensee’s arrangements or relevant legislation.

1. At such low risk levels, it would not be reasonably practicable, nor would ONR expect a licensee to expend significant resource pursuing an even greater risk reduction. While ONR considers that a risk of a fatality of one in a million per year is low enough to satisfy no danger, this cannot guarantee that other, particularly environmental, legislation will not impose ongoing management requirements on the delicensed land[[9]](#footnote-10). Therefore, it would be prudent for any licensee submitting a delicensing application to have regard for any legislation other than the NIA65 [2] that might apply to the delicensed site and to seek the views of the appropriate government department, appropriate environment authority, and LA.

### Appropriate published documents

1. To help calculate the appropriate activity levels for different radionuclides to meet the no danger level, there are a number of published documents.
2. The ‘Scope of and exemptions from the radioactive substances legislation in England, Wales and Northern Ireland’ [22] provides guidance on numerical values for artificial radionuclides, and for NORM used for their radioactive, fissile or fertile properties (sometimes referred to as a ‘practice’) which are based on a radiation dose of 10 µSv per year. These are provided within table 2.3 and 3.1 within the guidance document.
3. IAEA GSR Part 3 [16] provides definitions and the criteria for exemption and clearance. Table I.1 provides levels for exemption of moderate amounts of material without further consideration exempt activity concentrations and exempt activities of radionuclides. Table I.2 provides levels for exemption of bulk amounts of solid material without further consideration and clearance of solid material without further consideration: activity concentrations of radionuclides of artificial origin. These tables are reproduced within GSG 17 [17] where further information is provided. It states that for artificial radionuclides which are bulk amounts (solids) the values in table I.2 should be used. These values have been calculated to a dose of 10 µSv per year. This is nuclide specific and considers the most limiting activity concentration from the different pathways for each nuclide.
4. It is recommended that the licensee use the values in table I.2 within GSR Part 3 [16] as the basis of comparison with licensee’s residual activity concentrations, hence demonstrate achievement of no danger. Within GSG 17 [17], further information is provided of how to use the values in table I.2 for mixture of radionuclides in paragraph 4.23.
5. Where it is not suitable to use the values in GSR Part 3 (for example radium radionuclides are not covered within the table), the licensee may present other values and arguments to demonstrate that the risks are reduced to meet the no danger level.
6. The risks for all reasonably foreseeable future uses of the site given its nature and location, including for example agriculture and water abstraction, should be addressed. All current and reasonably predictable sources, pathways and target receptor groups should be considered. Information to undertake this work to internationally acceptable methodologies exist.   
   For example, the UK Health Security Agency (UKHSA) publication NRPB-W36 (Methodology for Estimating Doses to Members of the Public from Future Use of Land Previously contaminated with Radioactivity) [23].
7. The extension of the application of the contaminated land regime under Part IIA of Environmental Protection Act 1990 [24] to radioactive contaminated land may apply. Separate regimes apply in England, Wales and Scotland. This adds clarity to the Government’s requirements on the standards required for the remediation of formally identified radioactive contaminated land and bring them into line with those for non-radioactive contaminated land. However, these regimes are intended to apply to intervention situations and will not necessarily be applicable to the situation on delicensing sites, which is akin to a ‘practice’. Additionally, any site that is decontaminated to the levels where delicensing is agreed will not be subject to these regimes.

### Consideration of the effect of delicensing a site or part of site

1. The possible risk factors to a part of a site considered for delicensing from the remaining NLS should be addressed in the assessment. The effects of delicensing part of a site on the remaining NLS should also be considered. These include factors that may affect the continued operational safety of the remaining part of the site, for example shared services, emergency arrangements, security arrangements, access/egress for the NLS.
2. Potentially the licensee should inform the LA of the scope and criteria of the delicensing so the LA can take it into account when assessing subsequent planning decisions or local emergency planning arrangements.

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# Glossary and abbreviations

ACoP Approved Code of Practice

ALARP As Low As Reasonably Practicable

DNSR Defence Nuclear Safety Regulator

EASR18 Environmental Authorisations (Scotland) Regulations 2018

EPR16 The Environmental Permitting (England and Wales) Regulations 2016 (as amended)

GSG17 General Safety Guide No.17

GSR Part 3 General Safety Requirements Part 3

HSE Health and Safety Executive

HSWA74 Health and Safety at Work etc. Act 1974 (as amended)

IAEA International Atomic Energy Agency

IRR17 Ionising Radiations Regulations 2017

LA Local Authority

LC Licence Condition

MARSSIM Multi-Agency Radiation Survey and Site Investigation Manual

MoU(s) Memorandum of Understanding(s)

NIA65 Nuclear Installations Act 1965 (as amended)

NIR71 Nuclear Installations Regulations 1971

NLS Nuclear Licenced Site

NORM Naturally Occurring Radioactive Material

OECD Organisation for Economic Co-operation

ORR Office for Road and Rail

RCL Radioactive Contaminated Land

SAP Safety Assessment Principle(s)

SFAIRP So Far As Is Reasonably Practicable

SWESC Site-Wide Environmental Safety Case

TAG Technical Assessment Guide(s)

TEA23 The Energy Act 2023

TSC Technical Support Contractor

UKAS UK Accredited Services

UKHSA UK Health Security Agency

WENRA Western European Nuclear Regulators’ Association

WMP Waste Management Plan

WS-G-5.1 Safety Guide No. WS-G-5.1

# Appendix – Supporting information for delicensing

1. This list is not exhaustive and will be updated with future relevant information as documentation becomes available giving advice and information on a number of aspects which effect delicensing.

**CRCE-RAD-003-2020: Principles for assessing the radiological impact of land contaminated with radioactivity** [25]

1. This report presents guiding principles which should form the basis of any assessment of the radiological impact from using land which is contaminated with radioactivity. The principles are intended to cover assessments undertaken in support of decisions being made in England and Wales within either the statutory regimes for the identification and remediation of land contaminated with radioactivity made under Part 2A of the Environmental Protection Act 1990 [24] or the Town and Country planning regimes.

**The SAFEGROUNDS + Learning network** [26]

1. There is extensive advice on the assessment and clean-up of radioactively contaminated sites, both nuclear and non-nuclear, that has been developed by this network of regulators, operators and policy makers over the past ten years. Non-radioactively contaminated land is also covered.

**The Multi-Agency Radiation Survey and Site Investigation Manual** [27]

1. This is an extensive document, but the Road Map section of the document presents a summary of the major steps presented in the full text.
2. The Road Map presents a summary of the planning, implementation, assessment, and decision-making phases for final status survey and identifies where guidance on theses phases is in the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM); this includes the Data Quality Objectives/Data Quality Assessment process. Each step in the process is described briefly along with references to the sections of MARSSIM to which the user may refer for more detailed guidance. Flow charts are provided to summarise the major steps in the Radiation survey and Site Investigation Process, again citing appropriate sections of MARSSIM. In addition to providing the user with basic guidance from MARSSIM, the Road Map also provides “rules of thumb” for performing compliance demonstration surveys.

**Radioactive Substances Regulation guidance for nuclear sites undergoing decommissioning** [28]

1. This government website provides guidance for the operators of nuclear sites in England and Wales undertaking decommissioning work under their radioactive substances’ activity environmental permit.

**Guidance on Requirements for Release of Nuclear Sites from Radioactive Substances Regulation** [29]

1. This guidance sets out the requirement for optimised plans for the management of the radioactive wastes from decommissioning and clean-up of a nuclear site, the standards that must be met if those optimised plans identify that radioactive wastes are best managed by on-site disposal and the standards that a nuclear site must meet to enable it to be released from radioactive substances regulation.

**Memorandum of Understandings (MoUs)** [30]

1. A MoU, sometimes referred to as a General Agreement, is essentially an administrative agreement between ONR and another/other party to ensure that the parties involved understand each other's responsibilities.
2. We have a number of these with different regulators, these can be found on the ONR website: [ONR - Agency Agreements, Memoranda of Understanding (MoUs) and working arrangements protocol](https://www.onr.org.uk/agency-agreements-mou.htm)

**EC Document RP122 - Practical use of the concepts of clearance and exemption** [31]

1. Part I of the document gives guidance on the concepts of exemption and clearance to practices and gives further guidance on specific clearance levels (in activity per unit mass) for the recycling of metals and building rubble. The concept of general clearance levels, default values for materials arising from any practice, any type of material and pathway and any pathway of recycling or reuse are presented.
2. The assessment methodologies and radionuclide specific clearance levels may be of use in consideration of the residual risks posed by nuclear site remediation programmes.
3. Part II of the document provides more detailed discussion of the way the basic safety standard introduced regulatory control of work activities and to what extent also the explicit release from regulatory requirements (exemption or clearance) may be applied to work activities.

**Scope of and exemptions from the radioactive substances legislation in England, Wales and Northern Ireland** [22]

1. This guidance represents an aid to interpretation of EPR16 [12]. It sets out how the various provisions in the legislation have been determined, and how each provision in some way supports the application of ‘risk-informed regulation’. Table 2.3 and 3.1 provide guidance on numerical values for artificial radionuclides, and for NORM used for their radioactive, fissile or fertile properties (sometimes referred to as a ‘practice’) which are based on a radiation dose of 10 µSv per year.

**Documents of the National Radiological Protection Board (now UKHSA) Vol. 9 No 2. - Radiological Protection Objectives for Land Contaminated with Radionuclides** [32]

1. This document gives advice on the radiological protection criteria for the change of use of land contaminated with radioactive material from past practises. It is aimed at non-nuclear sites but has generic principles that can be applied to nuclear sites.

**NRPB-W36. Methodology for Estimating Doses to Members of the Public from Future Use of Land Previously contaminated with Radioactivity** [23]

1. This report describes a methodology developed to assess doses to workers and members of the public from a variety of land uses, including the most restrictive, use of land contaminated with radioactive materials. Values of dose to the work force involved in remediation scenarios and those to members of the exposed public are calculated per unit concentration of the radionuclides present on the site.
2. A variety of exposure paths are considered. The values derived may be used to determine remediation levels for sites.

**Clearance and Radiological Sentencing: Principles, Processes and Practices for use by the Nuclear Industry** [33]

1. This was produced following consultation, including with the regulators. Its aim is to ensure consistent application of good practice within the nuclear industry for the management of "exempt" materials and wastes.

1. Appropriate environment authority is the Environment Agency, Natural Resource Wales and Scottish Environment Protection Agency for site locations in England, Wales and Scotland respectively. [↑](#footnote-ref-2)
2. Since the publication of WS-G-5.1 [21], international terminology has changed, and critical group is now referred to as representative persons. [↑](#footnote-ref-3)
3. This is a requirement under Environmental Impact Assessment for Decommissioning Regulations, 1999. [↑](#footnote-ref-4)
4. Unless it is subject to a process that results in an increase in the radiation exposure as detailed in Para 10 of schedule 23 to EPR16 [12]. [↑](#footnote-ref-5)
5. For example, HSE’s “Tolerability of Risk” and “Reducing Risks, Protecting People” publications. [↑](#footnote-ref-6)
6. National Radiological Protection Board publication “Living with Radiation” [35] states (page 24) “the annual risk of fatal cancer associated with the average annual dose of 2.6 mSv to the public in the UK from all sources of radiation is about 1.3 x 10-4 or 1 in 7700.” In 2010 Public Health England annual review of doses [34] it was concluded that the average background radiation remains similar, at 2.7 mSv a year. [↑](#footnote-ref-7)
7. For example, the complete removal of previously contaminated buildings and foundations may significantly reduce any likelihood of there being any residual radioactivity – and hence dramatically lower the residual risk. Such actions may also offer further reassurance to potential future site occupants or owners. Weighed against this are the costs of undertaking the work and the associated disbenefits to the wider environment. Such considerations would vary from site-to-site and may depend strongly on property values and foreseeable commercial use. [↑](#footnote-ref-8)
8. Paragraph 90 provides further information of reasonably foreseeable scenarios. [↑](#footnote-ref-9)
9. Activities in relation to radioactively contaminated land may be subject to regulations under the EPR16 [12]/EASR18 [13]. In addition, Part IIA of the Environmental Protection Act 1990 [24] defines “contaminated land”, and provides for its remediation, and this may have any implications for any chemical contamination that may be present. It may be sensible for any assessment of the risks arising from residual radioactivity to be assessed alongside chemical contamination. This may enable remedial measures to address all risks in a more cost-effective way than if they are considered at different times. [↑](#footnote-ref-10)