

**Delicensing of the Imperial College Consort Reactor Site**  
**Assessment of Licensee's Delicensing Application**

Project Assessment Report ONR-SDFW-PAR-21-015  
Revision 0  
22/03/2022

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## EXECUTIVE SUMMARY

### Delicensing of the Imperial College Consort Reactor Site

#### Permission Requested

The licensee, Imperial College of Science and Technology and Medicine has requested in a letter to the Office for Nuclear Regulation (ONR) dated 28 October 2021 that the Nuclear Site Licence No. 7B for the Consort Reactor site within the Imperial College Reactor Centre is revoked, and that the period of responsibility under that licence is ended (this process is known as 'delicensing').

In support of its request the licensee has submitted a delicensing safety case to ONR as evidence in support of its claim to have met the requirement of section 5(3) of the Nuclear Installations Act 1965 that in its opinion there has ceased to be any danger from ionising radiation from anything on the licensed site.

#### Background

The Consort Reactor site is located within the Imperial College Reactor Centre at Silwood Park near Ascot. The main facility on the licensed site was the Reactor Building, housing the Consort reactor, with a number of support and ancillary buildings outside the licensed site.

The Consort reactor was a small research reactor (100 kW) which was moderated, cooled, reflected and partially shielded by light water. The reactor was operational from 1965 to 2012, with the fuel being removed from the reactor in 2014.

After over 40 years of operation and following a significant decline in the volume of research conducted in the facility, Imperial College decided to decommission the reactor and therefore enable them to move to eventual demolition of Reactor Centre buildings, subsequent land remediation and eventual deregulation of the site.

Following completion of decommissioning, demolition and land remediation, Imperial College is seeking to delicense the Consort Reactor site.

#### Assessment and inspection work carried out by ONR in consideration of this request

ONR has carried out a radiological protection assessment of Imperial College's delicensing safety case to support the application for delicensing of the Consort Reactor site. The safety case was examined and assessed by ONR and in accordance with ONR's internal procedures.

ONR commissioned independent radiological monitoring, sampling, assessment, and analysis by the United Kingdom Health Security Agency (UKHSA). This assisted

ONR in making a judgement as to the suitability and adequacy of the licensee's request.

ONR also assessed the licensee's arrangements for the ongoing storage of documents as required by ONR's published guidance on delicensing existing licensed nuclear sites. The arrangements were deemed to be adequate.

Input was sought from ONR Security and Nuclear Liabilities inspectors to confirm delicensing did not conflict with any requirements of the Nuclear Industries Security Regulations or Environmental Impact Assessment for Decommissioning Regulations. The Environment Agency was also consulted as required by the Nuclear Installations Act 1965.

### **Matters arising from ONR's work**

All issues identified during ONR's delicensing assessment and inspection work that needed to be addressed prior to the revocation of the site licence have been resolved.

### **Conclusions**

From the assessment of the licensee's delicensing safety case and the independent activities carried out by UKHSA, ONR considers that there is "no danger" from ionising radiation from what remains of the Consort Reactor site.

Therefore, the licensee's period of responsibility under the Nuclear Installations Act 1965 may be ended.

### **Recommendation**

On the basis of the application submitted by Imperial College and the conclusions set out above it is recommended that:

- ONR's Decommissioning Fuel & Waste Sites Superintending Inspector accepts this Project Assessment Report to confirm support for the ONR technical and regulatory arguments that justify the revocation of the nuclear site licence for the Consort Reactor site.
- ONR's Chief Nuclear Inspector revokes Nuclear Site Licence No. 7B for the Consort Reactor site thereby giving effect to ONR's opinion that there has ceased to be any danger from ionising radiations from anything remaining on the site.

## LIST OF ABBREVIATIONS

ALARP	As low as reasonably practicable
EIADR	Environmental Impact Assessment for Decommissioning Regulations
ICRC	Imperial College Reactor Centre
NIA65	Nuclear Installations Act 1965
NISR	Nuclear Industries Security Regulations 2003
ONR	Office for Nuclear Regulation
UKHSA	United Kingdom Health Security Agency

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## **1 PERMISSION REQUESTED**

1. The licensee, Imperial College of Science, Technology and Medicine (Imperial College) has requested in a letter to the Office for Nuclear Regulation (ONR) dated 28 October 2021 [1] that the Nuclear Site Licence No. 7B for the Consort Reactor site within the Imperial College Reactor Centre (ICRC) is revoked, and that the period of responsibility under that licence is ended.
2. The licensee has submitted a delicensing safety case [2] to ONR as evidence in support of its claim that there has ceased to be any danger from ionising radiations from anything on the site.
3. Section 5(1)(a) of the Nuclear Installations Act 1965 (NIA65) [3], empowers the appropriate national authority (in this case ONR) to revoke a nuclear site licence. For this to occur ONR informs the licensee that their ‘period of responsibility’ for the nuclear licensed site is coming to an end (Section 5(14)(b)) on a certain date, only when ONR gives its opinion to the licensee that there has ceased to be any danger from ionising radiation from the site (Section 5(15)(a)). This is known as delicensing.
4. When considering an application to delicense all or part of a licensed site, the policy statement on delicensing, “ONR Criterion for Delicensing Nuclear Sites” [4] specifies the requirements for enabling “no danger” under NIA65, of which the main requirements are:
  - A demonstration that any residual radioactivity above background radioactivity, which remains on the site, which may or may not have arisen from licensable activities, will lead to a risk of death to an individual using the site for any reasonably foreseeable purpose, of no greater than one in a million per year.
  - A dose to an individual of 10  $\mu$ Sv or less per year broadly equates to the one in a million per year ‘no danger’ criterion and is consistent with other legislation and international advice relating to the radiological protection of the public.
  - If an operator can demonstrate that the above criterion can be met, ONR may be content for the site to be removed from the requirements of the NIA65. However, the overarching requirements of the Health and Safety at Work Act 1974, which requires operators to ensure health and safety so far as is reasonably practicable (or, equivalently, that risks are reduced “as low as reasonably practicable” (ALARP) also apply and ONR will expect the operator to demonstrate that they have also considered these overarching ALARP requirements.

## **2 BACKGROUND**

5. The Consort Reactor site is located within the Imperial College Reactor Centre at Silwood Park near Ascot. The licensee, Imperial College, wishes to “deregulate” the Imperial College Reactor Centre, which includes delicensing of the Consort Reactor site.

6. Figure 1 shows an overview of the Reactor Centre, including the licensed site<sup>1</sup>. The Reactor Building (which housed the Consort reactor) is within the licensed site boundary. In addition, a workshop area, an environmental analysis section and other associated buildings lie outside the licensed site.
7. The Consort reactor was a small research reactor (100 kW) which was moderated, cooled, reflected and partially shielded by light water. The reactor was operational from 1965 to 2012, with the fuel being removed from the reactor in 2014.
8. After over 40 years of operation and following a significant decline in the volume of research conducted in the facility, Imperial College decided to decommission the reactor. Thus enabling them to move to eventual demolition of the Reactor Building and other Reactor Centre buildings, subsequent land remediation and eventual deregulation of the site. Imperial College applied to ONR in 2015 for permission to decommission the Consort reactor which was granted in July 2015 [6].
9. Following completion of decommissioning Imperial College is seeking to delicense the Consort Reactor site.
10. Imperial College is also seeking “deregulation” from the Environment Agency for all parts of the Reactor Centre. The licensed site is subject to an environmental permit (under the Environmental Permitting Regulations 2016) for the discharge of radioactive waste. This Project Assessment Report is only concerned with decision to revoke the nuclear site licence.
11. The objective of this Project Assessment Report is to describe the assessment carried out by ONR of the licensee’s application and make recommendations as appropriate regarding delicensing the Consort Reactor site.

### **3 ASSESSMENT AND INSPECTION WORK CARRIED OUT BY ONR IN CONSIDERATION OF THE REQUEST TO REVOKE THE LICENCE**

12. Section 3 of this project assessment report describes the assessment and inspection work carried out by ONR. ONR’s conclusions are described in section 5 below.

#### **3.1 RADIOLOGICAL PROTECTION ASSESSMENT IN SUPPORT OF DELICENSING**

13. The licensee’s delicensing safety case has been assessed by ONR’s Radiological Protection specialism and an Assessment Report has been produced [7].
14. The objective of the assessment was to judge the licensee’s claim that any residual radioactivity above background radioactivity, which remains on the

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<sup>1</sup> Figure 1 is taken from the history file produced by the licensee [2], the boundary of the licensed site aligns with the site map accompanying the site licence and a variation made in 1989 [5].



site, which may or may not have arisen from licensable activities, will lead to a risk of death to an individual using the site for any reasonably foreseeable purpose, of no greater than one in a million per year i.e. the requirement of the “no danger” criterion had been met. The assessment was carried out in accordance with ONR guidance to inspectors on the interpretation and implementation of the criterion of no danger for the delicensing of nuclear sites [8].

15. In accordance with ONR guidance [9] United Kingdom Health Security Agency (UKHSA) was commissioned to undertake independent radiological measurements (monitoring, sampling, and analysis) and assessment of the delicensing safety case. The UKHSA assessment and findings has been written up in a report [10] provided to ONR.
16. From the assessment of the licensee’s delicensing safety case and the independent verification carried out by UKHSA, ONR considers that there is “no danger” from ionising radiation from what remains of the Consort Reactor site.

### **3.2 SECURITY MATTERS**

17. Imperial College has written to ONR to apply for security plan revocation. In this letter, Imperial College has stated that the Consort Reactor site no longer holds nuclear or radioactive material, as defined in the Nuclear Industries Security Regulations (NISR) 2003 (as amended). Additionally, when ONR agrees to the revocation of the nuclear site licence, the site will no longer be a ‘nuclear premises’ as described by Regulation 2(1) (a-c) of NISR and will therefore not be required to hold, manage or operate an ONR-approved security plan.
18. ONR Security has considered [11] the request for revocation of the security plan and has confirmed that when ONR agrees that the nuclear site licence can be revoked, this can also trigger the revocation of the security plan.

### **3.3 ENVIRONMENTAL IMPACT ASSESSMENT FOR DECOMMISSIONING REGULATIONS**

19. The Consort Reactor site is subject to the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999, as amended (EIADR) [12]. Prior to commencing the decommissioning project at Imperial College, the licensee was required to obtain consent from ONR under EIADR, which was granted in 2015 [6].
20. Input was sought from ONR Nuclear Liabilities on the interaction between EIADR and delicensing [13].
21. The end state for the decommissioning project is described as:
  - “Once the decommissioning and demolition work are complete there will be no buried features, services or drains remaining on site. The site

will be levelled and laid to amenity grass as is typical for other open areas within the Silwood Park Campus.” (Environmental Statement, para 2.4.28)

22. Imperial College has completed the substantive decommissioning and dismantling work described in the original application for consent. However, the agreed end state for the project has not been completely met. Imperial College intends to level the ground and sew with amenity grass to meet the agreed end state however, this work has not been completed at the time of considering the request to delicense.
23. ONR has received legal advice relating to the interaction between nuclear site delicensing and other regulations [14]. The advice given was that EIADR could remain in force after a nuclear site licence has been revoked.

### **3.4 RETENTION OF RECORDS**

24. The ONR guide on the Delicensing Process for Existing Licensed Nuclear Sites [9] requires that “Any person who may have suffered harm as a consequence of activities on a licensed nuclear site is entitled to make a claim for compensation for up to 30 years after the date of the occurrence which gave rise to the claim (section 15 of NIA65). Consequently, upon delicensing and/or the ending of the period of responsibility for all or part of a licensed site, the licensee must make secure arrangements for relevant records to be retained for at least that period.”
25. The licensee has made arrangements, which in my opinion appear to be adequate, to satisfy this requirement for document retention [15]

### **3.5 CONSULTATION**

26. ONR is required by NIA65 to consult with the appropriate environment authority before revoking a nuclear site licence. The Environment Agency has been consulted and it has confirmed that it does not believe there is any legal prejudice between the revocation of the site licence and the process it is carrying out under the Environmental Permitting Regulations 2016 [16].

### **3.6 LEGAL RAMMIFICATIONS OF DELICENSING**

27. NIA65 section 5 gives ONR the power to revoke a nuclear site licence, but also states that the licensee’s period of responsibility under the Act does not end until ONR gives notice in writing that there has ceased to be any danger from ionising radiations from anything remaining on the site. A revocation document, made under section 5 of the Act, has been drafted stating that the licensee’s period of responsibility will end with the revocation of Nuclear Site Licence No. 7B.
28. Annex 1 provides the draft revocation which has been reviewed by the Government Legal Department [17].

29. Annex 2 provides the letter to be sent to Imperial College accompanying the revocation.

#### **4 MATTERS ARISING FROM ONR'S WORK**

30. None.

#### **5 CONCLUSIONS**

31. From the assessment of the licensee's delicensing safety case and the independent verification carried out by UKHSA, ONR considers that there is "no danger" from ionising radiation from what remains of the Consort Reactor site.
32. Therefore, the licensee's period of responsibility under NIA65 may be ended.

#### **6 RECOMMENDATIONS**

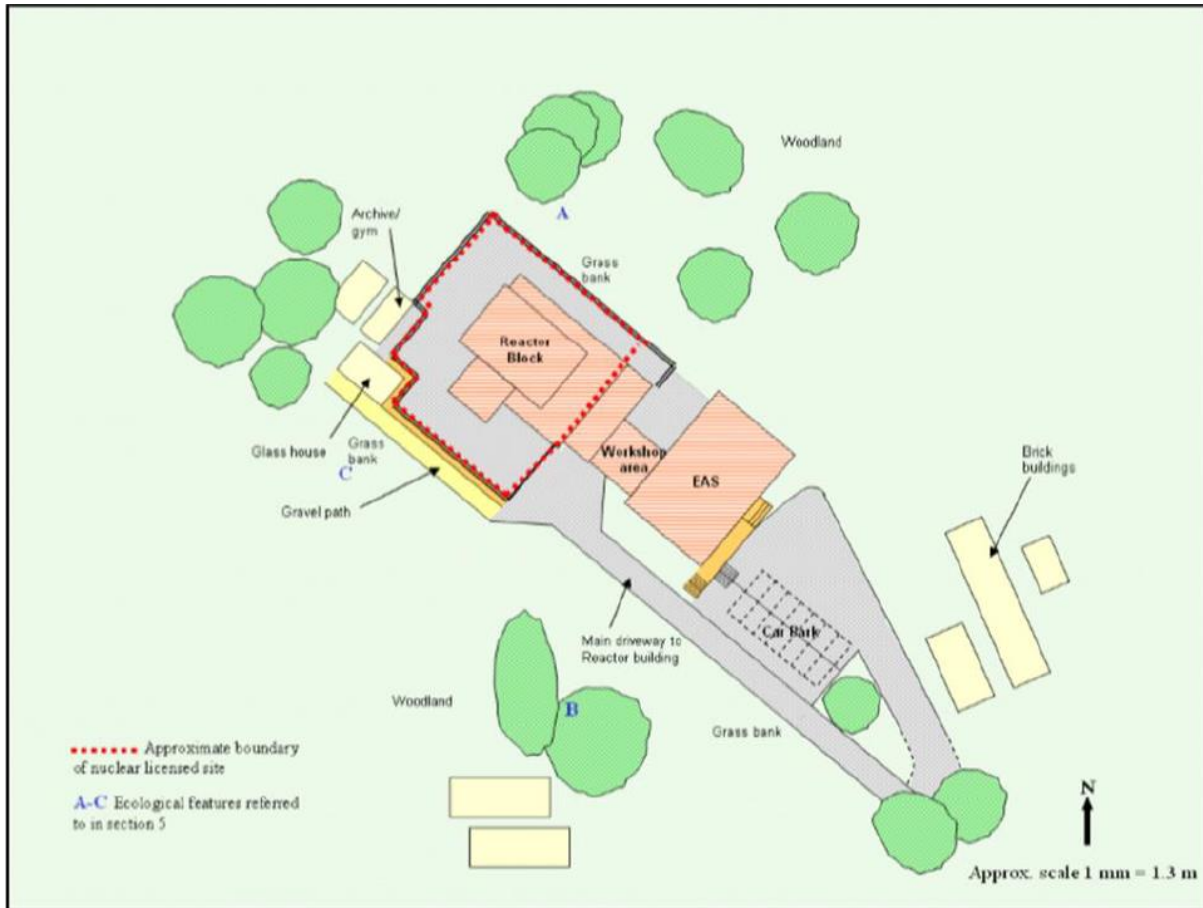
33. On the basis of the application submitted by Imperial College and the conclusions set out in section 5 above it is recommended that: -
- ONR's Decommissioning Fuel & Waste Sites' Superintending Inspector accepts this Project Assessment Report to confirm support for the ONR technical and regulatory arguments that justify the revocation of the nuclear site licence for the Consort Reactor site.
  - ONR's Chief Nuclear Inspector revokes Nuclear Site Licence No. 7B for the Consort Reactor site thereby giving effect to ONR's opinion that there has ceased to be any danger from ionising radiations from anything remaining on the site.

## 7 REFERENCES

1. Letter from Imperial College to ONR requesting revocation of nuclear site licence 7B, 28<sup>th</sup> October 2021, 2022/15394
2. Imperial College Delicensing Safety Case, submitted January 2022, 2022/6560 and 2022/6562
3. Nuclear Installations Act 1965 (as amended),  
<http://www.legislation.gov.uk/ukpga/1965/57>
4. ONR Criterion for Delicensing Nuclear Sites, NS-PER-POL-001, Issue 1
5. Consort Reactor Nuclear Licensed Site Map:  
1968 (original licence), 2019/23946 and 2019/239440  
Current state, reflecting 1989 variation, 2019/239449, 2019/309332,  
2019/246256 and 2019/239575
6. Assessment of application for EIADR consent to decommission the Imperial College Consort reactor, ONR-DFW-PAR-15-005, Revision 0, 2015/209334
7. Radiological Protection Assessment in Support of Delicensing the Imperial College of Science, Technology and Medicine's Consort Reactor Nuclear Licensed Site at Silwood Park Campus, Ascot, London. Revision 1, ONR-SDFW-AR-21-039, 2022/8633
8. Guidance to inspectors on the interpretation and implementation of the ONR criterion of no danger for the delicensing of nuclear sites, NS-PER-GD-019, Issue 1.
9. The Delicensing Process for Existing Licensed Nuclear Sites, NS-PER-IN-005, Revision 3
10. Assessment of the documentation and measurements submitted in support of delicensing of the Imperial College of Science, Technology and Medicine's Consort Reactor Nuclear Licensed Site at Silwood Park Campus, Ascot, London, UKHSA, UKHSA-RCE-DSD-001-2022, February 2022, 2022/13665
11. Email: ICRC nuclear site licence and security plan revocation, 23<sup>rd</sup> February 2022, 2022/15249
12. Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (as amended), November 1999, HM Government.  
<https://www.legislation.gov.uk/uksi/1999/2892/contents/made>
13. Imperial College Delicensing EIADR Assessment, ONR-SDFW-AN-21-064, Revision 1, 2022/17837
14. Email - 520A Legal questions regarding PRC & EIADR, February 2019, Government Legal Department. 2019/46643
15. Email: Retention of ICRC Records, 23<sup>rd</sup> February 2022, Imperial College, 2022/15398

16. Letter from EA in response to ONR consultation, 16 March 2022, EA Reference EPR/VB3135DV/S002, ONR Reference SDFW90014N, 2022/17618
17. Email from Government Legal Department confirming accuracy of Revocation, February 2022, 2022/15534

**Figure 1**  
**Overview of Imperial College Reactor Centre**



## Annex 1 Nuclear Site Licence Revocation

Site Licence No. 7B

### **NUCLEAR INSTALLATIONS ACT 1965 (“the 1965 Act”)** **REVOCATION OF NUCLEAR SITE LICENCE**

Imperial College of Science, Technology and Medicine  
Consort Reactor

1. The Office for Nuclear Regulation, in pursuance of section 5(1)(a) of the 1965 Act, hereby revokes Nuclear Site Licence No.7B granted to Imperial College of Science and Technology on 18<sup>th</sup> December 1968 in respect of the Consort Reactor site.
2. In the opinion of the Office for Nuclear Regulation there has ceased to be any danger from ionising radiations from anything on the site. Therefore, in pursuance of sections 5(14) and 5(15) of the 1965 Act, the licensee's period of responsibility under the said licence will cease at the time of the coming into force of this revocation.
3. This revocation shall come into force on (tbc).

Dated

For and on behalf of the Office for Nuclear Regulation

M. Foy  
Chief Nuclear Inspector  
A person authorised to sign in that behalf

**Annex 2  
Letter to Imperial College**

**Office for Nuclear Regulation  
Third Floor  
St James House  
St James Square  
Cheltenham  
Gloucestershire  
GL50 3PR**

**Our Reference:  
Unique reference:**

Date:

Dear,

**NUCLEAR SITE LICENCE NO. 7B**

Further to the application submitted by Imperial College of Science, Technology and Medicine to de-license the Consort Reactor nuclear licensed site, please find enclosed one white original and one photocopy revocation for nuclear site licence 7B. The revocation was signed by the Chief Nuclear Inspector on .....

As the site is no longer a “nuclear premises”, as described in the Nuclear Industries Security Regulations 2003, notice is hereby given that the Nuclear Site Security Plan (NSSP) for....., Reference....., dated....., is revoked with effect from..... All documentation relating to the NSSP must be appropriately disposed of in accordance with approved procedures; any National Security Vetting leaver notifications or lapsed clearances must be notified to ONR.

We note that some work, which was consented by ONR as part of the decommissioning project under the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999, remains outstanding. Please notify ONR when this work has been completed.

Yours sincerely,