

UK Research Centre in NDE (RCNDE) Members Handbook

This Handbook is a reference tool for all members of RCNDE, offering guidance on how the Centre works.

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Note: this handbook needs to be read in conjunction with the RCNDE Collaboration Agreement signed by the member.

1 RCNDE General summary

The Research Centre for Non-Destructive Evaluation (RCNDE) is a collaboration between industry and the Universities of Bristol, Nottingham, Strathclyde, Manchester, Warwick, Liverpool, Southampton and Imperial College London to coordinate the latest research on Non-Destructive Evaluation (NDE) technologies.

The Centre consists of University members, Full industrial members, Non-profit industrial members and Associate members. More information on members on [Section 2-Membership](#). The industrial membership of RCNDE is represented by the NDE Research Association (NDEvR). More information on [Section 3-NDEvR](#).

RCNDE's mission is *"To be the world-leading centre of excellence in NDE research through active partnership with the industrial user community"*.

The three guiding principles to achieve it are to:

1. Support world-class scientific research
2. Deliver industrial benefit
3. Demonstrate impact on NDE profession.

RCNDE was founded in 2003 and in January 2021 entered its fourth phase, RCNDE4. RCNDE1, 2 and 3 were co-funded by the UK Engineering and Physical Sciences Research Council (EPSRC) and the Centre's industrial members in the form of a single grant award lasting 5-6 years each.

With the aim of transforming NDE into a fully integrated part of the engineering life cycle, RCNDE4 is constructed around a wide portfolio of activities. These range from longer-term, higher risk adventurous research, through medium-term application research and short-term practical developments to technology transfer activities. Other activities include strategic leadership initiatives such as the NDT Leadership Forum, NDE 4.0 Working Group and various requirements-capture workshops in collaboration with the British Institute of NDT.

In addition, RCNDE has had a linked Centre for Doctoral Training (CDT) since 2005. Currently two CDTs co-exist, the EPSRC CDT in Quantitative NDE (led by Imperial College) and the EPSRC CDT in Future Innovation in NDE (FIND-CDT), which is co-funded by EPSRC and RCNDE's industrial members and provides an excellent route for members to access arising technology and trained NDE engineers and scientists.

2 Membership and membership agreements

RCNDE was founded in 2003 and co-funded by the UK Engineering and Physical Sciences Research Council (EPSRC) and its original 5 industrial members. Since then, the membership has grown to 14 full industrial members and more than 40 associate members, a category introduced in 2005 to incorporate vital technology providers and the key players within the supply chain. The University members have changed throughout time and grown from 6 to 8 members. A full list of RCNDE's members can be found in [Appendix 1](#).

Non-Disclosure Agreement (NDA)

NDEvR uses a two-way confidentiality agreement when dealing with non-members on matters that might be confidential. Both institutions and individuals can sign the agreement which is then valid for 5 years.

Full industrial membership

Normally end-users of the technology in a variety of sectors from aerospace to energy production to public sector.

Full members benefit from:

1. steering research programmes to meet company strategic objectives
2. value for money through leverage of funding opportunities
3. cross-sector industrial collaboration
4. early access to new technologies, including rights to use research outputs
5. access to state-of-the-art facilities and international experts for advice
6. networking with industrial and academic members
7. access to the latest updates from the NDE supply chain (associate members)
8. world-class talent via RCNDE's associated doctoral training scheme.
9. our track record of transitioning research outcomes into industrial application.

All full members also obtain a seat and a vote at the RCNDE Management Board. More information in [Section 4- Centre Management](#).

The current membership fee for full members is £42,000 p.a., with discounts available for long term membership uptake. The full membership is governed by the RCNDE Collaboration Agreement.

Tier 2 industrial membership (Non-profit, National laboratories organisations)

Category introduced in May 2022 that is aimed at organisations having related national objectives for steering & supporting the NDE research & technology transfer agenda, but not explicitly deriving commercial benefit from it. This category's annual membership fee will be 50% (£21k p.a.) of the standard annual membership fee and the qualifying organisations will become RCNDE Board members with voting rights.

Associate membership

Normally companies and organisations in the NDE supply chain and related areas. The associate membership is governed by the RCNDE Associate Member Collaboration Agreement.

Associate members benefit from:

1. early awareness of research results
2. access to credible new technologies
3. networking opportunities
4. participation in associated doctoral training scheme

Associate members are not part of the Centre's Management Board.

The membership fee for this category ranges based on the organisation's size.

Description	Size range of enterprise	Associate annual membership fee (excl. VAT)
Micro	Fewer than 10 employees	£100
Small	Between 10 and 49 employees	£300
Medium	Between 50 and 249 employees	£1000
Large	250 and more employees	£5000

Qualifying UK Catapult Centres, RTOs, national laboratories and not-for-profit organisations with 50 or more employees can benefit from a discounted rate for the next smaller size category. The Associate membership is governed by the RCNDE Associate member agreement.

		FULL INDUSTRIAL MEMBERSHIP £42K per annum *	NON-PROFIT MEMBERSHIP £21k per annum **	ASSOCIATE MEMBERSHIP Variable ***
BENEFITS	Steering research programmes to meet company strategic objectives, i.e. seat at the Management Board and voting rights, participation in the periodic Review of the NDEvR Vision	Yes	Yes	No
	Value for money through leverage of funding opportunities	Yes	Yes	No
	Able to bid for RCNDE internal funding calls, when applicable	Yes	Yes	No
	Cross-sector industrial collaboration and networking opportunities	Yes	Yes	Yes
	Early access to new technologies, including royalty -free rights to use research outputs	Yes	No (IP rights can be acquired via a licence)	No (IP rights can be acquired via a licence)
	Access to state-of-the-art facilities and international experts for advice	Yes	Yes	No
	Access to the latest updates from the NDE supply chain (associate members)	Yes	Yes	N/A
	Access to world-class talent via RCNDE's associated doctoral training scheme	Yes (no access fee)	Yes (£2k pa. access fee)	Yes (£4k pa. access fee)
	Facilitation of higher-TRL programmes	Yes	Yes	Yes
	Guidance and assistance with technology transfer	Yes	Yes	Yes
	Access to full reports of RCNDE research projects	Yes	Yes	No (access to a summary report)
	MEETINGS	Industrial working groups and tours of university labs	Yes	Yes
Annual review conference		Yes	Yes	Yes
Centre for Doctoral Training conference		Yes	Yes	Yes
Progress webinars of core research projects		Yes	Yes	No
Technology Transfer days		Yes	Yes	Yes
Technology workshops		Yes	Yes	Yes
RCNDE Board meetings		Yes	Yes	No
Free attendance to workshops co-organised by RCNDE		Yes	Yes	No (discounted rates)

Notes:

* Full industrial membership discounts:

£1.5k p.a. for a 3-year membership commitment

£3k p.a. for a 5-year membership commitment

** Non -profit membership discounts:

£750 p.a. for a 3-year membership commitment

£1.5k p.a. for a 5-year membership commitment

*** Variable associate membership:

1) Fewer than 10 employees: £100 p.a.

2) 11-50 employees: £300 p.a.

3) 51-250 employees: £1,000 p.a.

4) More than 250 employees: £5,000 p.a.

Table 1 – RCNDE industrial membership categories comparison

University membership

A consortium of universities with expertise in a wide range of NDE techniques, including ultrasonic bulk and guided waves, thermographic, electromagnetic, advanced optical and non-contact methods, amongst others.

During RCNDE1, RCNDE2 and RCNDE3, the University membership was determined by the grant collaboration agreement. In RCNDE4, University members are defined as those with “at least a Principal Investigator or Co-Investigator for a [core research project](#) (involving at least 1 researcher-year of effort at that university), or a Principal Investigator for a [targeted research project](#) (involving at least 1 researcher-year of effort at that university), in the Centre’s overall research programme. In addition, a university is considered a member for a further two years after the formal completion date of a qualifying project”.

University members obtain a seat and a vote at the RCNDE Management Board. More information in [Section 4- Centre Management](#).

3 NDE Research Association Limited (NDEvR)

NDE Research Association Limited (NDEvR) is a company limited by guarantee and whose members and directors comprise individuals from the Centre's management, members' representatives and co-opted individuals agreed by the RCNDE Management Board. NDEvR acts as the RCNDE's legal representative and is appointed for the purposes of day-to-day management of the Centre's commercial and legal affairs. The existence of NDEvR stems from the need of having a separate entity to RCNDE, with a legal status, that helps to manage the income coming from membership fees which are used NDEvR to pay for research projects conducted at the universities, as well as for the Centre's management costs. By having a registered company with legal status, the income and expenditure can be audited as necessary and accordingly to the law.

From 2010 to 2020, NDEvR was one of EPSRC's Strategic Partners and both organisations have an ongoing relationship.

NDEvR Vision

The full industrial members collaborate together every 5 years to produce a collective view of their future requirements for NDE in their respective industry sectors, and more specifically at 5, 10 and 20-year horizons, which is called the "NDEvR Vision". The industrial vision provides a clear roadmap to steer RCNDE's activities in order to create opportunities and value for all.

The NDEvR vision is updated every 5-6 years, so far 2011, 2016 and 2021. The latest NDEvR Vision can be accessed at Insight, the Journal of the British Institute of Non-Destructive Testing ([Vol. 64, No. 11, pp 625-632, November 2022](#)).

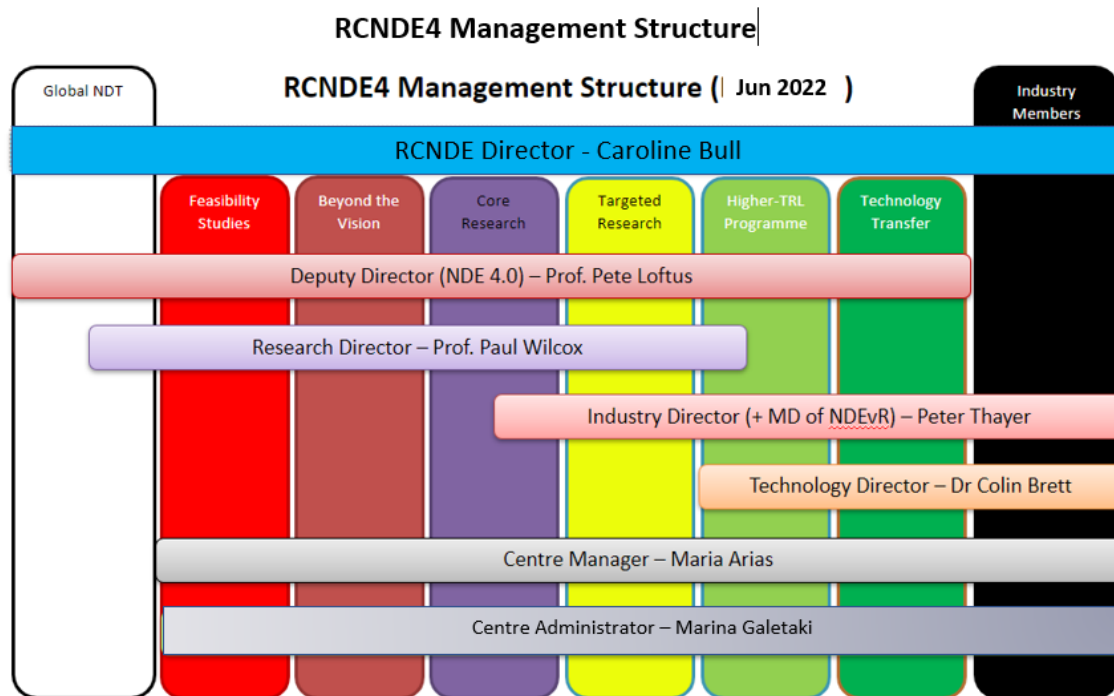
4 Centre Management

The RCNDE Management Board

The Director reports to a Management Board comprising industrial and university board members and EPSRC. As per Appendix 2 of the RCNDE membership agreement, the Board is the highest governance mechanism of RCNDE and is chaired by one of the full industrial members' representatives. It has ultimate responsibility for all policy and strategic issues, as well as approving and directing the Centre's activities, with each full industrial and university member having one vote. The Centre undertakes to ensure effective communication between the researchers and industry, both informally and formally via the Board. The Terms of Reference for the RCNDE Management board can be found in Appendix 2 of the RCNDE Collaboration agreement and can be modified as necessary, subject to Management Board approval.

The RCNDE Management Team – RCNDE MT

The Centre is run by a Director who is appointed by the Management Board. The Director has oversight and responsibility for all Centre activities, technical programmes and industrial liaison but is accountable to the RCNDE Board which is the highest governance mechanism of RCNDE. The Centre Manager assists the Director with administering and running the Centre and is supported by an Administrator. Other roles are Research Director, Industry Director (who is also currently Managing Director of NDEvR) and Technology Director to oversee the Higher-TRL programme, technology transfer and the TRL reviews and Research Register. There is also a Deputy Director role that focuses on strategic activities around industry 4.0.



The International Advisory Board

The International Advisory Board (IAB) is a group of international experts in NDE that provides independent advice and guidance to ensure RCNDE's research activities are of world-leading quality. The IAB plays an essential role during the annual review process by providing constructive and independent feedback for the different research projects. Its members also engage with the RCNDE academic community during regular visits to the various research groups. The IAB is composed of four leading academics, but on occasions the RCNDE MT invites to the IAB ad-hoc members with particular technical expertise as required by the Centre's running projects. The profiles of our permanent IAB members can be found in the RCNDE website, [here](#).

5 Research portfolio

RCNDE supports a wide range of research activities, from longer-term, higher risk adventurous research, through medium-term application research and short-term practical developments and to technology transfer activities. Different activities are funded by different mechanisms and catalogued as Core research, Targeted research, Transitioning research and Aligned research as per the Standard Mode proposals procedure. More information in [Section 6 - Procedures](#).

Vision-focused Core research

Aimed at TRL 1-3, they create and develop solutions for requirements in NDEvR Vision. They are medium-sized projects led by some of the exiting RCNDE university partners and have the support from the whole industrial membership represented via NDEvR.

Industry-focused Targeted research

These projects address medium-to-long term NDE requirements of member companies, as well as fulfilling RCNDE's strategic objectives. They also are mid-sized projects aimed at the practical application of research (TRL 1-4). They are led by one of the RCNDE university partners and receive support from a subset of industrial members.

Transitioning research

These projects are an efficient, fast and streamlined mechanism for transitioning RCNDE technologies into industry and are aimed at TRL 4-6. Their size can range from 6 months to 3 years.

Aligned research

RCNDE supports research outside the NDEvR vision via the Aligned projects category. These projects can be led by any UK university, not only those part of RCNDE, and receive in-kind support from RCNDE in the form of access to facilities and specialist advice. They can aim at TRL1-6 and differ from the rest in that the research does not address requirements from the NDEvR vision. Early Career Fellowships and New Investigator awards are also considered Aligned Projects.

6 Procedures

RCNDE has an evolving number of procedures that guide some of its activities. They can be found in the Members area webpage '*RCNDE Procedures*'. A summary of each is provided below:

- Access to the RCNDE research programme – establishes the mechanisms for universities to become RCNDE academic members and describes the aspects of the RCNDE research programme that are open to non-member universities.
- Process for NDEvR-sponsored ICASE studentships - describes the Industrial CASE (ICASE) scheme and the process for allocating this type of studentships when they are co-funded by NDEvR using industry funding.
- Standard Mode Project Process – determines the research category of proposals submitted to RCNDE by any of the academic members. It describes the different stages of approval required for each category.
- Feasibility studies/Technology Transfer annual call – provides information on the call, the timelines and the scoring system as well as on the reporting of the awarded projects.
- Annual Review - provides information on how the annual review is conducted, who is involved and the outputs from the review.
- International Advisory Board procedure – provides the terms of reference for the IAB.
- Impact-enhancement programme – explains the route for incorporating aligned, and even external grants, into the Core programme in return of additional money for impact activities.

7 Annual cycle of activities

RCNDE has an established cycle of annual activities and events. The main ones are the RCNDE Management Boards which are accompanied by other meetings. A summary is below.

Meetings (by month):

1. January/February – Industrial Working group, Annual Technology Transfer event, Board Meeting and optional industry-only/academics-only meetings. Usually organised on the last week of January. In person meeting.
2. April/ May - Industrial Working group, RCNDE Annual Review Day, CDT Conference and Board Meeting. In person meeting. Timing depends on Easter and half-term holidays.
3. September - Board Meeting. Online meeting but some years organised in conjunction with the BINDT annual conference in which case it is in person.

The in-person meetings are arranged at the cities of the RCNDE universities on a rota basis.

Additional in-person/online meetings might be called depending on needs.

Different types of industrial members can attend different meetings. A summary of the access levels for each meeting is provided in Table 1 – RCNDE industrial membership categories comparison.

Calls (by type):

Announcements about open calls are sent regularly to those eligible. They are also publicised in The RCNDE Newsletters and website. Below is a brief summary of each call and more information can be found in the Members area webpage '*RCNDE Procedures*'.

1. Technology transfer/ Feasibility studies - This is an internally run annual call that funds small projects in size and duration, typically around £25-£30k for a 6-month project. The projects can aim to either test a new idea or to start moving a technology in the TRL scale. The process for these starts in September and ends by April. Projects are expected to run on the year that they have been awarded and the results of the project to be presented at one of the Board meetings. Eligible organisations are RCNDE universities and full members.
2. iCASE studentship vouchers – 2-3 iCASE studentships per year are allocated to NDEvR by EPSRC. iCASE studentships receive additional funding from NDEvR and focus on areas of relevance for the majority of the RCNDE members as described in the NDEvR vision. The process starts in September/October and finishes in December when following an internal competition, the vouchers are allocated to a university member. The studentships start on the October of the following year. Eligible organisations are RCNDE universities.
3. Impact enhancement – This funding route aims at enhancing the impact of projects that have already been approved for 100% funding from other funding bodies. RCNDE offers 10% of the existing project cost (£60k additional max funding) to increase the outcomes' impact. The call is launched in September. Eligible organisations are RCNDE universities.
4. Ad-hoccalls aimed at providing the Centre with a baseline of Core projects.

8 Policies

RCNDE has a series of policies for particular aspects which can be found in the Members area webpage 'Policy' folder. The most relevant for our members are listed below:

- Data protection policy
 - Social media policy
 - Impartiality policy
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Table of Definitions

Table of definitions	
CDT	Centre for Doctoral Training
Co-I	Co-Investigator (of a project)
Co-PI	Co- Principal Investigator (of a project)
EngD	Engineer Doctorate
EoI	Expression of Interest
EPSRC	Engineering and Physical Sciences Research Council
IAB	International Advisory Group
ICASE	Industrial CASE studentships
NDA	Non-Disclosure Agreement
NDE	Non-Destructive Evaluation
NDEvR	NDE Research Association Ltd.
PI	Principal Investigator (of a project)
RCNDE	UK Research Centre in Non-Destructive Evaluation
RCNDE MT	RCNDE Management Team

Appendix 1 – RCNDE Membership (December 2022)

University Members

University of Bristol
Imperial College London
University of Liverpool
University of Manchester
University of Nottingham
University of Southampton
University of Strathclyde
University of Warwick

Full industrial Members

Airbus
BAE Systems
BP
Dstl
EDF Energy
Hitachi
IHI
Jacobs
ONR
Petrobras
Rolls-Royce
Sellafield Lt (representing Nuclear
Decommission Authority (NDA)
Shell

Associate Members

Advanced Halls Sensors
Alba Ultrasound
ARTC
Baker Hughes
Baugh & Weedon
BINDT
Cokebusters
DB SAS (aka TPAC)
Diondo
Dolphitech
Eddyfi Technologies
EEMUA
EPRI
GUL
Inductosense
Innerspec UK
Inspectahire
Ionix Advanced Tech.
Jetsoft
Level X NDT
MTC
NDT Global
NPL
Nuclear AMRC
Olympus NDT
Peak NDT
Permasense
Phoenix ISL
QinetiQ
QualUT
Renishaw
Sonomatic
Sound Mathematics
Tessonics Europe
Theta Technologies
Tribosonics
Theta Technologies
Tribosonics
TWI
UKAEA
Unitive Design
USL
Verasonics
Waygate Technologies
WesDyne