



**NSAI**

# ANNUAL REPORT 2022

NSAI TECHNICAL COMMITTEE  
NSAI/TC 49/SC 03 - ROBOTICS

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## 1 Committee Chair

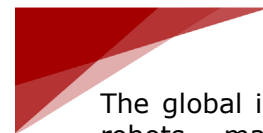
In 2020 NSAI invited Mr Tom Meany to take up the role of chair. Mr. Meany has been very active in providing presentations on standards at committee meetings and providing reports on international meetings.

Mr Meany is a functional safety technical specialist on the Industrial and Instrumentation Group working at Analog Devices (Limerick) for over 7 years, with extensive experience in the area of Functional Safety. Mr Meany is a member of NSAI/TC 48/SC 14, NSAI/TC 48/SC 10, NSAI TC 48/SC 01 and NSAI/ETC/TC 100/SC 1.

## 2 Introduction

This Standards Committee was created as a Working Group to feed into the National Steering Committee on Collaborative Robotics by following the activities of [ISO/TC 299 Robotics](#).

The National Steering Committee on Collaborative Robotics was created by the Irish Development Agency (IDA) with the purpose of assisting the Irish manufacturing industry with the introduction of industrial robots into collaborative operations and applications with human workers.



The global industrial robots market is projected to grow from \$16.78 billion in 2022 to \$35.68 billion by 2029

The primary focus of the Standards Committee is on Industrial Robotics at an ISO level and the development of safety requirements through Standards, that will enable the introduction of humans into the workspace of an industrial robot. The workspace of an industrial robot has traditionally been a restricted space. In collaborative application, this workspace will be redefined as a shared space. The safety of the human worker is the ultimate concern.

## 3 Scope of TC

The scope of this Standards Committee is standardization in the field of robotics, excluding toys and military applications.

This Committee does not produce indigenous Irish Standards, instead it is focussed on participating in the development of International Standards at an ISO level.

The International Standards published by ISO will be adopted as European Standards and harmonised to the Machinery Directive where applicable. NSAI will then adopt these European Standards as Irish Standards.

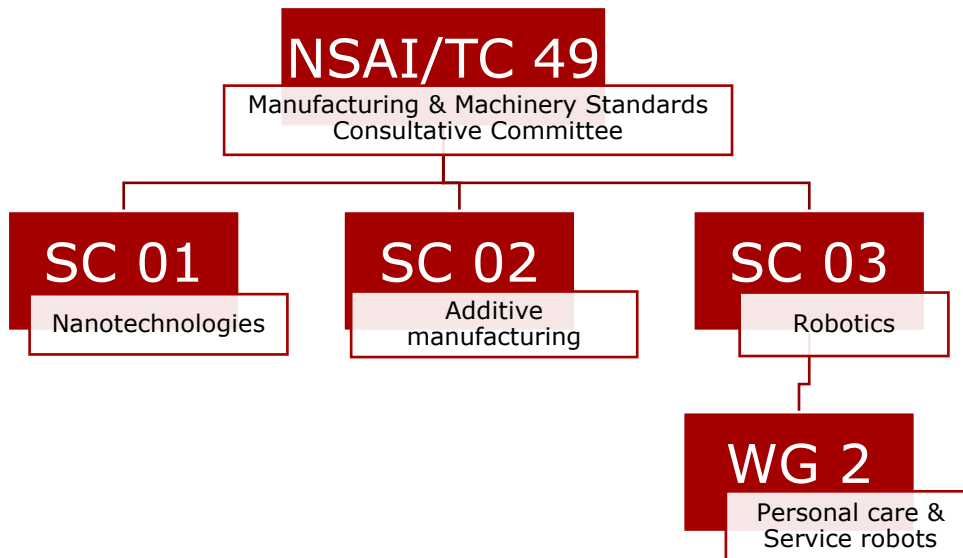
The committee mirrors the following international committees:

Committee Name	Committee Title
<b>ISO/TC 299</b>	Robotics
<b>ISO/TC 299/WG 2</b>	Service robot safety
<b>ISO/TC 299/WG 3</b>	Industrial safety
<b>ISO/TC 299/WG 4</b>	Service robot performance
<b>ISO/TC 299/WG 6</b>	Modularity of service robots

## 4 Structure and Membership

### 4.1 Structure

The Figure below illustrates the structure of the National Committee:



### 4.2 Members

The list below are the member organisations for the year 2022:

Organisation	Role
<b>ABB Robotics</b>	Committee member
<b>Analog Devices</b>	Chairman
<b>Boston Scientific</b>	Committee member
<b>Dublin City University</b>	Committee member
<b>Eiratech</b>	Committee member
<b>Future Mobility Ireland</b>	Committee member
<b>Health &amp; Safety Authority</b>	Committee member
<b>Iamus Technologies</b>	Committee member
<b>Irish Manufacturing Research</b>	Committee member
<b>ITS Ltd</b>	Committee member
<b>KUKA Robotics</b>	Committee member
<b>Munster Technological University</b>	Committee member
<b>NSAI</b>	Secretary
<b>Pilz</b>	Committee member
<b>Queen's University Belfast</b>	Committee member
<b>Reliance Automation</b>	Committee member
<b>Rockwell</b>	Committee member
<b>Schivo Group</b>	Committee member
<b>South East Technological University</b>	Committee member
<b>Somex Automation</b>	Committee member
<b>Trinity College Dublin</b>	Committee member

<b>Technological University Dublin</b>	Committee member
<b>University College Dublin</b>	Committee member
<b>University of Limerick</b>	Committee member

## 5 Summary of 2022 Activities

### 5.1 National

#### 5.1.1 Meetings

The meetings were conducted via web-conferencing meeting facilities bearing in mind the COVID-19 Pandemic, as well as to reduce the burden and environmental impact of travel for members. Committee members attended the following national meetings as follows:

Meeting No.	Date	Minutes Reference ** optional**
1	02 <sup>nd</sup> March 2022	N 110
2	04 <sup>th</sup> May 2022	N 170
3	16 <sup>th</sup> November 2022	N 198

#### 5.1.2 National Work

The Standards Committees does not draft any National Standards, instead, the Committee is focussed on international standards development. All of the ISO/TC 299 Standards that are adopted as European Standards, will be published as Irish Standards.

### 5.2 International/Regional

#### 5.2.1 Meetings

Committee members attended international meetings as follows:

Committee Name	Location	Date	No. of Attendees
ISO/TC 299/WG 3	Online	10 <sup>th</sup> January 2022	2
ISO/TC 299/WG 3	Online	11 <sup>th</sup> January 2022	2
ISO/TC 299/WG 3	Online	12 <sup>th</sup> January 2022	2
ISO/TC 299/WG 3	Online	24 <sup>th</sup> January 2022	2
ISO/TC 299/WG 3	Online	25 <sup>th</sup> January 2022	2
ISO/TC 299/WG 3	Online	26 <sup>th</sup> January 2022	1
ISO/TC 299/WG 3	Online	27 <sup>th</sup> January 2022	2
ISO/TC 299/WG 3	Hybrid	07 <sup>th</sup> February 2022	1
ISO/TC 299/WG 3	Hybrid	08 <sup>th</sup> February 2022	1
ISO/TC 299/WG 3	Hybrid	09 <sup>th</sup> February 2022	1
ISO/TC 299/WG 3	In person	04 <sup>th</sup> October 2022	1
ISO/TC 299/WG 3	In person	05 <sup>th</sup> October 2022	1
ISO/TC 299/WG 3	In person	06 <sup>th</sup> October 2022	1
ISO/TC 299/WG 3	In person	07 <sup>th</sup> October 2022	1
ISO/TC 299	In Person	12 <sup>th</sup> - 16 <sup>th</sup> December 2022	0

### 5.2.2 International/Regional Work

Ireland is committed to following and inputting into the revision of the International Standards for the Safety Functionality of Industrial Robotics (ISO 10218). Since 2017 Ireland has been represented at each of the meetings held in Europe and internationally. In 2022 COVID-19 and environmental considerations impacted on Irish delegates travelling to the ISO/TC 299/WG3 meetings.

The focus of the work is on the requirements around the collaborative applications for robotics and humans.

### 5.2.3 International/Regional Standards Reviewed

ISO/WD PAS 5672; Robotics — Collaborative applications — Test methods for measuring forces and pressures in quasi-static and transient contacts between robots and human

ISO/TS 15066:2016; Robotics — Robots and robotic devices — Collaborative robots

ISO/FDIS 10218-1; *Robotics — Safety requirements — Part 1: Industrial robots*

ISO/FDIS 10218-2; *Robotics — Safety requirements — Part 2: Industrial robot systems, robot applications and robot cells*

### 5.2.4 International/Regional Voting Results

The committee voted on three out of 11 international votes in 2022.

## 5.3 Regulatory Development/Update

### ***New EU Proposal for a Regulation on Machinery Products***

In April 2021, the European Commission presented its Proposal for a new Regulation on Machinery Products<sup>1</sup>. The main legal changes are the transformation of the Machinery Directive into a Regulation, with alignment to the New Legislative Framework. The Regulation, when adopted, will facilitate the homogenous application throughout the EU. and an alignment with the horizontal rules on the responsibilities of economic operators, market surveillance, accreditation, as well as the role of notified bodies and the conformity assessment procedure.

This new Machinery Regulation will ensure that the new generation of machinery guarantees the safety of users and consumers, in addition encouraging innovation. This is achieved by adapting the essential requirements of the legislation to the latest developments in technology, including the collaboration between human and robots.

The Robotic standard developed under the Regulation may be adopted as Harmonised Standards, providing manufacturers with the presumption of conformity to this Regulation. When the Machinery Regulation comes into force, it will be the core legislation for the safety of, for example, lawn mowers, robots or 3D printers.

On 15 December 2022, negotiators from the European Parliament and Council of the EU reached a provisional political agreement on a new Machinery Regulation, adapting the rules to new market developments and risks originating from emerging technologies. It is expected that it will be adopted in the near future.

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<sup>1</sup> European Commission, "Regulation on Machinery Products", 2021, [Online]. Available on: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021PC0206&from=EN>. [Accessed on: 08th February 2023]

The new Regulation envisages that six categories of machinery will be included in Annex I, thereby subject to third party conformity assessment, supported by strong procedures for updating the Annex with additional categories. The new Regulation will apply from 42 months after entry force, thus giving companies time to adjust to the new requirements.

### **EU Coordinated Plan on Artificial Intelligence & Proposal for a Regulation on AI**

Furthermore, the European Commission has recognised the importance of AI in Robotics in the 2021 review of the Coordinated Action Plan on AI<sup>2</sup> stating that "Robotics powered by AI is a key enabler for the EU's productivity, competitiveness, resilience, and open strategic autonomy while preserving an open economy in the digitalising world". Therefore, The EU AI Act<sup>3</sup> will be of interest as it will provide a uniform legal framework for the development, marketing and use of AI systems in robotics through a risk-based approach, in combination with the Machinery Regulation.

Additionally, the EU Data Act<sup>4</sup> is also relevant. It is part of the overall European strategy for data, complements the Data Governance Regulation of November 2020, by clarifying who can create value from data and under which conditions. When adopted, it will provide clarity with regards who can access data generated by connected products such as robotics through Internet of Things (IoT) devices.

## 6 Irish Publications/Reviews

### 6.1 Publications

National standards are not produced by this committee as it is focussed instead on the development of International Standards. These international standards may be published as European Standards and then adopted as Irish Standards.

### 6.2 Reviews

The Committee reports to the Manufacturing & Machinery Standards Consultative Committee and the Chairman participates in the work of that group.

## 7 Work programme for 2023 onwards

ISO/FDIS 10218-1; *Robotics -- Safety requirements for robot systems in an industrial environment -- Part 1: Robots*

ISO/FDIS 10218-2; *Robotics -- Safety requirements for robot systems in an industrial environment -- Part 2: Robot systems and integration*

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<sup>2</sup> European Commission, "Coordinated Plan on artificial Intelligence", 2022 [Online] Available on: <https://digital-strategy.ec.europa.eu/en/policies/plan-ai#:~:text=The%20Coordinated%20Plan%20on%20Artificial,to%20avoid%20fragmentation%20in%20Europe.> [Accessed 8th February 2023]

<sup>3</sup> European Commission, "Artificial intelligence Act", 2021 [Online]. Available on: <https://eur-lex.europa.eu/legal-content/FR/TXT/PDF/?uri=CELEX:52021PC0206&from=EN> [Accessed 08th February 2023]

<sup>4</sup> European Commission, " Data Act", 2022 [Online]. Available on: [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_22\\_1113](https://ec.europa.eu/commission/presscorner/detail/en/ip_22_1113) [Accessed 08th February 2023]

ISO/TS 15066:2016; Robotics — Robots and robotic devices — Collaborative robots  
TR for guidance on the revised ISO 10218-2 due to its increased contents

## 8 Additional Information

Irish experts have attended the ISO/TC 299/WG 3 Industrial Safety of Robots meetings over the past number of years and made significant contributions to the revision of ISO 10218-1 and ISO 10218-2. In January 2021 an Irish comment submitted as part of the public enquiry stage for ISO 10218-1, was accepted as a means of avoiding having solely a Performance Level d, Category 3 architecture requirement, which was a major discussion point over three previous meetings of ISO/TC 299/WG 3.

The Chairman, Mr Tom Meany, was presented with a "1997 Award" in October 2020. The "1997 Award" is presented to members of NSAI Committees in recognition of the significant contribution to the standards work of NSAI.

Dr Nikolas Papakostas a committee member from UCD was involved in the Horizon 2020 project SHERLOCK - Seamless and safe human centred robotic applications for novel collaborative workplaces, that concluded in September 2022. Dr Papakostas co-authored multiple peer reviewed articles as part of the deliverables of this project.

Dr Dorel Picovici a committee member from South East Technological University (SETU) and course Director, announced the new 4-year programme to produce an adaptable graduate capable of working across industries where robotic and automated systems are employed. This new Bachelor of Engineering Robotics and Automation Systems Degree Course, which started in September 2022, will cater for the growing demand for graduates to be industry ready with an adaptable skill set for the emerging technology in the robotics and automation industry.

Dr Ken Horan Director of Robotics and Automation at the Irish Manufacturing Research Centre (IMR) and a committee member involved in MAAS – Measurement Aided Assembly of Large-scale structure project. MAAS was a 2-year project funded by Smart Eureka and supported by Enterprise Ireland (EI) and the Centre for the Development of Industrial Technology (CDTI). The major goal of the MAAS project was to develop an efficient automated solution for the manufacturing of aircraft sub-assemblies. The project evaluated the use of collaborative robots and related automated activities within manufacturing, assembly, and inspection operations. A mobile robotics solution was designed, developed, and integrated into a prototype assembly line in IMR. Irish SMEs were central to this project and worked closely with IMR to identify, develop and deliver a full wing and panel 3D scanning and measurement solution.