



## TC ANNUAL REPORTING FORM

### IMS Technical Committee

### TC3-Condition Monitoring & Fault Diagnosis Instrument

#### Reporting period

| Starting date (dd/mm/yy) | Ending date (dd/mm/yy) | Date of submission (dd/mm/yy) |
|--------------------------|------------------------|-------------------------------|
| 01/01/2024               | 31/12/2024             | 01/02/2025                    |

#### NA

| Website   | Last update (mm/yy) |
|---|---------------------|
| <a href="https://iee-ims.org/technical-committee/tc-03">https://iee-ims.org/technical-committee/tc-03</a> | 06/2020             |

#### TC Chair or co-Chairs

| First Name | Second Name | Family Name | Affiliation /Address                        | Membership number | Phone              | e-mail address     | Date of election |
|------------|-------------|-------------|---|-------------------|--------------------|--------------------|------------------|
| Xuefeng    |             | Chen        | Xi'an Jiaotong University, China            | 92136442          | +86<br>13689253672 | chenxf@xjtu.edu.cn | 12/10/2019       |
| Weihua     |             | Li          | South China University of Technology, China | 92239334          | +86<br>13751849150 | whlee@scut.edu.cn  | 12/10/2019       |

#### Secretary (check the right box)

Present

Not Present

| First Name | Second Name | Family Name | Affiliation /Address             | Membership number | Phone              | e-mail address          | Date of election |
|------------|-------------|-------------|----------------------------------|-------------------|--------------------|-------------------------|------------------|
| Yanmeng    |             | Liu         | Xi'an Jiaotong University, China | 100234133         | +86<br>18109205059 | chrisliuyanmeng@163.com | 12/10/2019       |

#### TC Membership list(\*)

| First Name | Second Name | Family Name | Affiliation /Address                        | Membership number | Phone              | e-mail address   | TC assignments (joining year) |
|------------|-------------|-------------|---|-------------------|--------------------|--|-------------------------------|
| Xuefeng    |             | Chen        | Xi'an Jiaotong University, China            | 92136442          | +86<br>13689253672 | <a href="mailto:chenxf@xjtu.edu.cn">chenxf@xjtu.edu.cn</a>                   | 2019                          |
| Weihua     |             | Li          | South China University of Technology, China | 92239334          | +86<br>13751849150 | <a href="mailto:whlee@scut.edu.cn">whlee@scut.edu.cn</a>                     | 2019                          |
| Zhaoyan    |             | Fan         | Oregon State University, USA                | 80022756          |                    | <a href="mailto:Zhaoyan.fan@oregonstate.edu">Zhaoyan.fan@oregonstate.edu</a> | 2019                          |

\* Please add as many rows as needed

|          |       |   |          |                     |  |      |
|----------|-------|---|----------|---------------------|--|------|
| Peng     | Wang  | University of Kentucky, USA                 | 92578261 |                     | <a href="mailto:Edward.Wang@uky.edu">Edward.Wang@uky.edu</a>                       | 2019 |
| Xingwu   | Zhang | Xi'an Jiaotong University, China            | 93066541 | +86<br>15829704145  | <a href="mailto:xwzhang@xjtu.edu.cn">xwzhang@xjtu.edu.cn</a>                       | 2019 |
| Qingbo   | He    | Shanghai Jiaotong University, China         | 91234903 |                     | <a href="mailto:qbhe@sjtu.edu.cn">qbhe@sjtu.edu.cn</a>                             | 2019 |
| Datong   | Liu   | Harbin Institute of Technology, China       | 91290762 |                     | <a href="mailto:liudatong@hit.edu.cn">liudatong@hit.edu.cn</a>                     | 2019 |
| Zhibo    | Yang  | Xi'an Jiaotong University, China            | 93064776 | +86<br>18092795291  | <a href="mailto:Yangbo-5-7@163.com">Yangbo-5-7@163.com</a>                         | 2019 |
| Yanjie   | Guo   | Xi'an Jiaotong University, China            | 93064776 |                     | <a href="mailto:guoyanjie@xjtu.edu.cn">guoyanjie@xjtu.edu.cn</a>                   | 2019 |
| Ruqiang  | Yan   | Xi'an Jiaotong University, China            | 41600650 | +86<br>13584054760  | <a href="mailto:yanruqiang@xjtu.edu.cn">yanruqiang@xjtu.edu.cn</a>                 | 2019 |
| Chuang   | Sun   | Xi'an Jiaotong University, China            | 95701526 | + 86<br>15029972684 | <a href="mailto:ch.sun@xjtu.edu.cn">ch.sun@xjtu.edu.cn</a>                         | 2021 |
| Guolin   | He    | South China University of Technology, China | 93678323 | +86<br>17701996607  | <a href="mailto:hegl@scut.edu.cn">hegl@scut.edu.cn</a>                             | 2019 |
| Rongchao | Zhao  | South China University of Technology, China | N/A      | +86<br>18922126636  | <a href="mailto:merczhao@scut.edu.cn">merczhao@scut.edu.cn</a>                     | 2023 |
| Huibin   | Lin   | South China University of Technology, China | N/A      | +86<br>15322230761  | <a href="mailto:hblin@scut.edu.cn">hblin@scut.edu.cn</a>                           | 2023 |
| Zhuyun   | Chen  | South China University of Technology, China | 93674143 | +86<br>15915939436  | <a href="mailto:mezychen@scut.edu.cn">mezychen@scut.edu.cn</a>                     | 2021 |
| Ruyi     | Huang | South China University of Technology, China | 95496925 | +86<br>13632184750  | <a href="mailto:huangruyi@scut.edu.cn">huangruyi@scut.edu.cn</a>                   | 2021 |
| Jipu     | Li    | South China University of Technology, China | 97279614 | +86<br>13609065953  | <a href="mailto:JPLee1994@outlook.com">JPLee1994@outlook.com</a>                   | 2021 |
| Jingyan  | Xia   | South China University of Technology, China | 97204487 | +86<br>15521172457  | <a href="mailto:1004222950@qq.com">1004222950@qq.com</a>                           | 2021 |
| Junbin   | Chen  | South China University of Technology, China | 97204519 | +86<br>18102636834  | <a href="mailto:202110180213@mail.scut.edu.cn">202110180213@mail.scut.edu.cn</a>   | 2021 |
| Shaowu   | Zheng | South China University of Technology, China | 97204562 | +86<br>18826076439  | <a href="mailto:shwuuzh@hotmail.com">shwuuzh@hotmail.com</a>                       | 2021 |
| Chong    | Xie   | South China University of Technology, China | 97204509 | +86<br>15216112742  | <a href="mailto:jxlnxc@qq.com">jxlnxc@qq.com</a>                                   | 2021 |
| Kairu    | Wen   | South China University of Technology, China | 98063954 | +86<br>18842500853  | <a href="mailto:973777027@qq.com">973777027@qq.com</a>                             | 2021 |
| Ke       | Yue   | South China University of Technology, China | 98064041 | +86<br>17802007055  | <a href="mailto:yonina26@163.com">yonina26@163.com</a>                             | 2021 |
| Dongpeng | Li    | South China University of Technology, China | 98675715 | +86<br>18138125628  | <a href="mailto:wi_dongpengli@mail.scut.edu.cn">wi_dongpengli@mail.scut.edu.cn</a> | 2022 |

\* Please add as many rows as needed

|         |      |   |           |                    |                              |      |
|---------|------|---|-----------|--------------------|------------------------------|------|
| Jiaxian | Chen | South China University of Technology, China | 98753676  | +86<br>15670506997 | 957386378@qq.com             | 2022 |
| Lijiao  | Yang | Xi'an Jiaotong University, China            | N/A       |                    | yang_lijiao@mail.xjtu.edu.cn | 2023 |
| Shujing | Lin  | Xi'an Jiaotong University, China            | 100057929 | +86<br>13629266129 | linshujing@xjtu.edu.cn       | 2024 |
| Feng    | Tian | Xi'an Jiaotong University, China            | 100188256 | +86<br>18092382418 | tianfeng@xjtu.edu.cn         | 2024 |
| Kai     | Zhou | Xi'an Jiaotong University, China            | 500893    |                    | 15091198313@163.com          | 2024 |

### TC mission – field of expertise (max. 1000 char. Including spaces)

The aim of the technical committee is to serve as a platform for scientists and engineers involved in the field of condition monitoring & fault diagnosis to focus on the potential applications in industry:

1. to encourage research on subtopics and challenging topics related to condition monitoring & fault diagnosis,
2. to promote and facilitate the exchange of knowledge between scientists,
3. to organize events related to condition monitoring & fault diagnosis,
4. to become an official consultative body for the industry in the field of condition monitoring & fault diagnosis instrument,
5. to promote new standards and guidelines.

### TC meetings in the reporting period<sup>(\*)</sup>

| Date (dd/mm/yy) | Online / Face2Face | Attendance (number) | TC Members | Information sent within 4 months to (Yes/No) |             |                        |
|-----------------|--------------------|---------------------|------------|--|-------------|------------------------|
|                 |                    |                     |            | Chair of TSAC                                | IM Magazine | Other (specify)        |
| 27/04/2024      | Online             | 6                   |            |  |             | TC3-P&P Modify-Meeting |
| 15/03/2024      | Online             | 6                   |            |  |             | TC3-P&P Modify-Meeting |

**Minutes of the yearly meeting (separate file)<sup>1</sup>: 240**

### Participation in Society sponsored Events (Conferences, Symposia, Workshops)<sup>(\*)</sup>

| Name of the Event | Starting date (event) | Ending date (event) | Date Participation | Type of participation (Yes/No) |         |          |                              |
|-------------------|-----------------------|---------------------|--------------------|--------------------------------|---------|----------|------------------------------|
|                   |                       |                     |                    | Sponsorship                    | Session | Tutorial | Other (specify) <sup>2</sup> |

<sup>1</sup> Yes/No, date of the yearly meeting;

<sup>2</sup> For example, Involvement in reviewing papers (and indicate approximate number of paper reviews for the listed event)

\* Please add as many rows as needed

|  | (dd/mm/yy) | (dd/mm/yy) | (dd/mm/yy)       |     |     |     |  |
|--|------------|------------|------------------|-----|-----|-----|--|
| International Conference on Sensing, Measurement & Data Analytics in the Era of Artificial Intelligence (ICSMD 2024)                         | 31/10/2024 | 03/11/2024 | full participant | Yes | Yes | Yes |  |
| 2024 IEEE International Instrumentation and Measurement Technology Conference (I2MTC)  | 20/05/2024 | 23/05/2024 | full participant | Yes | Yes | Yes |  |
| International Workshop on Big Data and AI-Driven Fault Diagnosis for Industrial Applications   | 14/06/2024 | 16/06/2024 | full participant | Yes | Yes | Yes |  |
| 8th International Conference on Condition Monitoring of Machinery in Non-Stationary Operations (CMMNO 2024)                                  | 11/05/2024 | 13/05/2024 | full participant | Yes | Yes | Yes |  |
| 2024 Annual Congress of the Dynamic Signal Analysis Committee of the China Society for Vibration Engineering                                 | 05/04/2024 | 07/04/2024 | full participant | Yes | Yes | Yes |  |
| 2024 National Academic Conference on Equipment Monitoring, Diagnostics and Maintenance   | 24/08/2024 | 27/08/2024 | full participant | No  | Yes | Yes |  |
| 2024 National Conference on Theory and Application of Advanced Production Systems and International Industry-University-Research Cooperation | 13/12/2024 | 15/12/2024 | full participant | Yes | Yes | Yes |  |
| Conference on Intelligent Manufacturing Forum and Frontier Forum of Industrial Engineering in the Greater Bay Area                           |            |            |                  |     |     |     |  |

### Involvement in standard development<sup>(\*)</sup>

| Standard          | Working Group | Revision | Activity in the reporting period, including dates                   | Notes, Attendance |
|-------------------|---------------|----------|---|-------------------|
| IM CM&FDI TC3 P&P |               |          | submitted the revised version of IM CM&FDI TC3 P&P on 28 April 2024 |                   |

### Participation in the development of Society Educational Programs<sup>(\*)</sup>

\* Please add as many rows as needed

| Program name | Involvement of chapters and sections | Activity in the reporting period, including dates | Notes, attendance |
|--------------|--------------------------------------|---|-------------------|
| N/A          |                                      |   |                   |

## Other Activities (tutorials, teaching, career, cooperation, publications, joint activity with chapters or sections) (\*)

| Type of activity | Starting date (dd/mm/yy) | Ending date (dd/mm/yy) | Activity in the reporting period   | Notes, attendance               |
|------------------|--------------------------|------------------------|--|---------------------------------|
| Tutorials        | 26/03/2024               | 26/03/2024             | Wearable Biomechanical Devices: From Energy Harvesting to Improved Walking Efficiency  | Prof. Qingguo Li                |
| Tutorials        | 24/05/2024               | 24/05/2024             | Bad data analysis in an era of big data  | Prof. Zidong Wang               |
| Tutorials        | 07/06/2024               | 07/06/2024             | The future of digital transformation led by industrial information and intelligence.   | Prof. Fugee Tsung               |
| Tutorials        | 28/06/2024               | 26/07/2024             | International Summer School of Xi'an Jiaotong University: Secrets of Plasticity and Ductile Fracture for Metals  | Prof. Dorel Banabic et al.      |
| Tutorials        | 08/07/2024               | 08/07/2024             | Modelling, Control and Diagnostics to Improve Reliability of Energy Generation and Transfers   | Assoc. Prof. Jaspreet S. Dhupia |
| Tutorials        | 28/07/2024               | 30/07/2024             | International Summer School of Xi'an Jiaotong University: Deep Learning in Industry Applications   | Prof. Zidong Wang               |
| Tutorials        | 18/10/202                | 18/10/2024             | Brain Robotics in Human-Robot Collaborative Assembly   | Prof. Lihui Wang                |
| Tutorials        | 29/10/2024               | 29/10/2024             | Aerodynamic noise from trains: research at ISVR  | Prof. David Thompson            |
| Tutorials        | 13/11/2024               | 13/11/2024             | Institute of Fundamental Technological Research of the Polish Academy of Sciences - scientific activity and its main achievements<br><br>Non-standard experimental methods for mechanical characterization of conventional, functional and printed materials | Prof. Zbigniew L. Kowalewski    |
| Tutorials        | 13/11/2024               | 13/11/2024             | Metal Forming in the production of light weight components   | Prof. Denis Politis             |
| Tutorials        | 16/12/2024               | 16/12/2024             | Intelligent soft sensing and prediction for industrial application<br><br>Building intelligent mechanical fault diagnosis frameworks with deep learning"   | Prof. Hamid Reza Karimi         |
| Award            | 09/12/2024               |                        | Gold Award in the 2024 Guangdong-Hong Kong-Macao Greater Bay Area High-Value Patent Cultivation Layout Competition   | Prof. Weihua Li et al.          |
| Award            | 14/12/2024               |                        | First Prize of Science and Technology Award (Basic Category) of China Society of Vibration Engineering, 2024   | Prof. Weihua Li et al.          |

## Recommended candidates(\*)

| Type (ADCOM, Fellow, Award -specify-) | First Name | Second Name | Family Name | Affiliation /Address | Motivation |
|---------------------------------------|------------|-------------|-------------|----------------------|------------|
|---------------------------------------|------------|-------------|-------------|----------------------|------------|

\* Please add as many rows as needed

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N/A

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## TC operating Plan: near-term plans for the upcoming year, including scheduled meetings, activities, and so on (max. 1000 char. Including spaces)

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In 2025, TC-3 will build on the previous year's still focus on enhancing the integration and practical application of condition monitoring and fault diagnosis technologies in key industries, such as nuclear power equipment, aero-engines, large and complex equipment and industrial robotics.

**1. Regular Progress Meetings:** To enhance the strategic coordination and effectiveness of the project, we will continue to hold regular progress meetings in 2025. Each meeting will be hosted by a different committee member to facilitate the exchange of ideas across industries and research areas. The meetings will include project progress reviews and detailed debriefs on current projects, discussions on emerging industry needs, and exploration of strategy adjustments. Based on the results of the discussion we will optimize our working methods and resource allocation. After the meeting, the Secretary will collate and circulate a summary of the meeting to solicit feedback from members for continuous improvement of the effectiveness of the meeting.

**2. Special Focus Workshops:** To address specific challenges in key industries, in 2025 we plan to organize a series of specialized seminars in collaboration with industry companies. These seminars will focus on how to integrate the latest diagnostic technologies with existing industrial needs. Each seminar will include in-depth case studies to co-analyze examples of successful diagnostic applications for practical reference. Also, interactive and expert discussions will be provided to enhance companies' understanding and ability to apply the new technologies and help experts to understand the needs of the industry. After the seminars, we will compile detailed conference proceedings to summarize the insights and recommendations gained.

**3. Enhanced Academic Activities and Collaboration:** TC-3 plans to organize a special session at the IEEE I2MTC 2025, the flagship conference of the IEEE IMS, which will be held in Chemnitz in May 2025. In addition, as we did last year, we will sponsor the International Workshop on Big Data and Artificial Intelligence Driven Fault Diagnosis for Industrial Applications, inviting distinguished researchers and practitioners from all subfields of condition monitoring and fault diagnosis.

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## TC operating plan: long term vision from 2-5 years out, based on IMS Strategic Plan, including areas of strength, areas for improvement, how is the subject area going to change, planned actions for lifting achievement succession plans, etc. (max. 1000 char. Including spaces)

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Over the next five years, TC-3 aims to establish itself as a thought leader in condition monitoring and fault diagnosis, driving innovation and setting industry standards. Key strategies include expanding a global expert network by establishing a robust framework with regional representatives to ensure broad geographical coverage and hosting international seminars for strategic discussions, knowledge sharing, and professional networking. In addition, TC-3 will focus on cultivating young professionals by launching a mentorship program that pairs them with experienced mentors based on their career interests and organizing annual workshops to develop essential skills such as grant writing, project management, and communication. Furthermore, the committee will prioritize cutting-edge research in predictive maintenance, artificial intelligence, and machine learning, conducting surveys and discussions with industry stakeholders to identify critical research areas while forging partnerships with leading technology companies to facilitate research and ensure the practical application of findings.

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\* Please add as many rows as needed



**TC convergence, synergy, cooperation with other TC, from I&M or other societies (max. 1000 char. Including spaces)**

To enhance its impact and incorporate cross-disciplinary technologies, TC-3 plans to collaborate with other technical committees and societies. This includes firstly launching joint research initiatives in partnership with TC-7 and related committees, focusing on integrating advanced sensing technologies and big data analytics into condition monitoring systems. Regular workshops and joint task groups will be organized to promote continuous interaction and knowledge exchange among the committees.

Secondly, holding interdisciplinary conferences and seminars. Considering the interconnectedness of today's technological fields, we plan to invite internationally leading experts to conduct academic lectures, summer courses, and more. In addition to the Condition Monitoring and Fault Diagnosis Instrument, these events will also cover key areas such as cyber security and data privacy. It will not only stimulate innovative solutions and promote cross-disciplinarity but also foster a broader understanding of how an integrated approach can enhance the safety and effectiveness of monitoring systems.

Finally, as condition monitoring technologies continue to evolve, the demand for standardized practices and protocols has become increasingly important. TC-3 will work closely with international standardization organizations to actively influence and promote the development of new standards as needed.

**Comments/Suggestions (max. 1000 char. Including spaces)**

N/A

\* Please add as many rows as needed