

Professor. Melinda Hodkiewicz  
Mechanical Engineering  
UWA Data Institute  
UWA Defence and Security Institute  
School of Engineering



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## Biography

Professor Melinda Hodkiewicz BA Hons (Oxon), PhD, CEng, FTSE is engineering academic working to improve maintenance, asset management and safety practices in industry. Data and the management and use of data is key to her work. She is active in development of the field of Technical Language Processing (TLP). TLP covers the adaption of natural language processing, knowledge graphs, ontologies and large language models to unstructured technical engineering texts.

In 2018 she was a visiting fellow at the Alan Turing Institute, the national centre for data science in the UK with their Data-centric Engineering group and in 2019 with the US Government's NIST Laboratory in Maryland. In 2021 she joined the Standards Australia EL069 committee focussing on Australia's input into the ISO TC184 SC4 committee on Industrial Data.

Melinda was the BHP Fellow for Engineering for Remote Operations 2015-2022. She was on the leadership team for the \$8.8M Australian Government and industry co-funded Training Centre for Transforming Maintenance through Data Science. She leads the Maintenance Working Group for Industrial Ontology Foundry and is active in ISO 23726 standard Automation systems and integration -- Ontology based interoperability and development of the Industrial Data Ontology. In 2016 Melinda was awarded the MESA Medal – The Lifetime Achievement Award for services to the asset management community in Australia and in 2019 was made a Fellow of the Australian Academy of Technology and Engineering. In 2022 she was a finalist in the Australian/ NZ Women in AI awards for the manufacturing sector.

Melinda was a member of the Advisory Board of NOPSEMA (National Offshore Petroleum Safety and Environmental Management Authority) for 6 years until 2022 and the Board of MRIWA (WA Government's Mineral Research Institute) 2021/22. She sat on the Advisory committee for METS Ignited and acted as a reviewer for the Federal Government's MMI funding program.

From 2012-2015 Melinda chaired Australia's MB19 committee and led Australia's involvement in the development of the ISO 55000/1/2 International Standards for Asset Management and the issuing of Australian AS/NZ edition.

## Qualifications

Metallurgy, BA(Hons), Metallurgy and Science of Materials, University of Oxford  
1981 → 1985

Award Date: 19 Jan 2029

Engineering, PhD, The effect of partial-flow operation on the axial vibration of double-suction pumps, The University of Western Australia  
... → 2014

Award Date: 20 Apr 2022

2019 → ... Member of IEEE, IEEE

2019 → ... Member of the Australian Academy of Technology and Engineering, ATSE

1992 → ... Member of Institute of Materials, Minerals and Mining, IOM3

## Employment

### Professor

Mechanical Engineering  
School of Engineering

1 Mar 2004 → present

**UWA Data Institute**

The University of Western Australia  
21 Apr 2022 → 31 Dec 2049

**UWA Defence and Security Institute**

The University of Western Australia  
23 Jun 2025 → 31 Dec 2049

**Senior Honorary Research Fellow**

School of Engineering  
27 Jul 1998 → present

**Committee Member**

Standards Australia Technical Committee EL-069 'Automation Systems and Integration'  
1 Mar 2022 → present

**Board member**

Minerals Research Institute of Western Australia  
East Perth, Australia  
1 Feb 2022 → present

**Visiting Researcher**

National Institute of Standards and Technology  
United States  
1 Nov 2019 → 1 Dec 2019

**Visiting Fellow**

Alan Turing Institute  
London, United Kingdom  
1 Jan 2018 → 1 Feb 2019

**Board Member**

National Offshore Petroleum Safety and Environmental Management Authority  
Australia  
1 Mar 2017 → present

**Comittee Member**

Member of the RIAC (Research and Innovation Council) committee  
1 Jul 2016 → 1 Dec 2021

**Chair**

Standards Australia MB19 Committee for ISO 55000 Standard  
Australia  
1 Jan 2010 → 1 Jan 2014

**Research outputs**

**Industrial Ontology Foundry (IOF) Maintenance Reference Ontology**

Hodkiewicz, M. (Developer), Woods, C. (Developer), Selway, M. (Developer) & Stumptner, M. (Developer), 2024

**lof-maint - Modular maintenance ontology.**

Hodkiewicz, M., Woods, C., Selway, M. & Stumptner, M., 2024, arXiv, (ArXiv).

**RelOps – A Whole-of-Organisation Approach for Reliability Analytics**

Hodkiewicz, M., Bikaun, T. & Stewart, M., 2023, *16th WCEAM Proceedings, 2022*. Crespo Márquez, A., Gómez Fernández, J. F., González-Prida Díaz, V. & Amadi-Echendu, J. (eds.). Springer Science + Business Media, p. 45-55 11 p. (Lecture Notes in Mechanical Engineering).

**An ontology for reasoning over engineering textual data stored in FMEA spreadsheet tables**

Hodkiewicz, M., Klüwer, J. W., Woods, C., Smoker, T. & Low, E., Oct 2021, In: *Computers in Industry*. 131, 103496.

**Rethinking maintenance terminology for an industry 4.0 future**

Hodkiewicz, M., Lukens, S., Brundage, M. P. & Sexton, T., 21 Mar 2021, In: *International Journal of Prognostics and Health Management*. 12, p. 1-14 14 p.

**Digitalization and reasoning over engineering textual data stored in spreadsheet tables**

Hodkiewicz, M., Kluwer, J. W., Woods, C., Smoker, T. & French, T., 2020, In: *IFAC-PapersOnLine*. 53, 3, p. 239-244 6 p.

**Towards a Reference Ontology for Maintenance Work Management.**

Hodkiewicz, M., Low, E. & Woods, C., 2020, *CEUR Workshop Proceedings: I-ESA Workshop 2020, Tarbes, France*. CEUR, Vol. 2900. (CEUR Workshop Proceedings).

**Why autonomous assets are good for reliability – the impact of ‘operator-related component’ failures on heavy mobile equipment reliability**

Hodkiewicz, M. R., Batsioudis, Z., Radomiljac, T. & Ho, M.T.-W., 2017, *Proceedings of the Annual Conference of the Prognostics and Health Management Society 2017*. Daigle, M. J. & Bregon, A. (eds.). PHM Society, Vol. 8. p. 552-558 7 p. (Proceedings of the Annual Conference of the Prognostics and Health Management Society, PHM).

**Cleaning historical maintenance work order data for reliability analysis**

Hodkiewicz, M. & Ho, M. T. W., 9 May 2016, In: *Journal of Quality in Maintenance Engineering*. 22, 2, p. 146-163 18 p.

**Asset management - quo vadis (where are you going)?**

Hodkiewicz, M., 2015, In: *International Journal of Strategic Engineering Asset Management*. 2, 4, p. 313-327

**Designing SNAKES AND LADDERS: An Analogy for Asset Management Strategy Development**

Hodkiewicz, M., 2015, In: *Simulation and Gaming*. 46, 5, p. 455-470

**The development of ISO 55000 series standards**

Hodkiewicz, M., 2015, *Engineering Asset Management - Systems, Professional Practices and Certification*. Hong Kong: Springer, Vol. N/A. p. 427-438

**Insights Gained from Analysis of Performance and Participation in a Flipped Classroom**

Hodkiewicz, M., 2014, In: *Education Research and Perspectives*. 41, p. 254-284

**Estimation, management and extension of the life of ultra-supercritical power plants**

Hodkiewicz, M., 2013, *Ultra-supercritical coal power plants - Materials, technologies and optimisation*. Zhang, D. (ed.). Cambridge, UK: Woodhead Publishing Limited, p. 213-227

**Relevant asset health information for executives**

Hodkiewicz, M., 2013, In: *International Journal of Strategic Engineering Asset Management*. 1, 4, p. 425-438

**Case study: Rio Tinto**

Hodkiewicz, M., West, G., Bartlett, N. & Tapsall, S., 2012, *International Case Studies in Asset Management*. Lloyd, C. (ed.). United Kingdom: ICE, p. 165-174

### **Seeing RED – Asset Health Information for Executives**

Hodkiewicz, M. & Sayyah, A., 2012, *Third International Engineering Systems Symposium*. Delft, Netherlands, Vol. N/A. p. 11pp

### **Snakes and Ladders – identifying risks to asset management strategy**

Hodkiewicz, M., 2012, *Third International Engineering Systems Symposium CESUN 2012*. Delft, Netherlands: Delft University of Technology, Vol. 3. p. 1-9

### **Challenges and Opportunities for Simulation Modelling Integrating Mine Haulage and Truck Shop Operations**

Hodkiewicz, M., Richardson, S. & Durham, R., 2010, *Proceedings of the 2010 Australian Mining Technology Conference "Technology changing the mining business footprint"*. Queensland, Australia, Vol. 2010. p. 163-172

### **Asset Management - A game of snakes and ladders?**

Hodkiewicz, M., Burns, P. & Wallsgrave, R., 2009, *Proceedings of the ICOMS Asset Management Council*. Sikarska, J. (ed.). Sydney, NSW, Australia ed. Australia: Asset Management Council, Vol. CD ROM. p. CD ROM

### **Using the decision model development process to assist in knowledge management**

Hodkiewicz, M., 2008, *ICOMS Asset Management Conference Proceedings*. Sikorska, J. (ed.). Fremantle WA ed. Fremantle WA: Asset Management Council, Vol. 1. p. 1-10

### **Education in Engineering Asset Management**

Hodkiewicz, M., 2007, *Proceedings of the ICOMS-2007 Asset Management Conference*. Robertson, K. & Francis, R. (eds.). Melbourne, Australia ed. Australia: Asset Management Council, Vol. NA. p. online

### **A Framework to Assess Data Quality for Reliability Variables**

Hodkiewicz, M., Kelly, P., Sikorska, J., Gouws, L. E. & Kennedy, J., 2006, *Proceedings of World Congress on Engineering Asset Management (WCEAM)*. Mathew, J., Ma, L., Tan, A. & Anderson, D. (eds.). Surfers' Paradise, Qld, Aust ed. London, UK: Springer, Vol. 1. p. Paper 021

### **Creating the next generation of reliability engineers**

Hodkiewicz, M., Sikorska, J. & Simpson, P., 2005, *Conference Proceedings (ICOMS 2005)*. Sullivan, T. & Kennedy, J. (eds.). Hobart, Australia ed. Australia: Engineers Australia, Vol. 1. p. 1-6

### **Identification of Transient axial vibration on double suction pumps during partial flow operation**

Hodkiewicz, M. & Pan, J., 2004, In: *Acoustics Australia*. 32, 1, p. 25-31

### **The effect of partial-flow operation on the axial vibration of double-suction centrifugal pumps**

Hodkiewicz, M., 2004, (Unpublished)

### **Identification of transient axial vibration on double-suction pumps during partial flow operation-Part I: experimental and data proceeding methods**

Hodkiewicz, M. & Pan, J., 2003, *Proceedings of 10th Asia-Pacific Vibration Conference*. Mathew, J. (ed.). Royal Pines Resort, Gold Coast ed. Queensland: Queensland University of Technology, Vol. 1. p. 181-186

### **Identification of transient axial vibration on double-suction pumps during partial flow operation-Part II: transient axial response identification**

Hodkiewicz, M. & Pan, J., 2003, *Proceedings of the 10th Asia-Pacific Vibration Conference*. Mathew, J. (ed.). Royal Pines Resort, Gold Coast ed. Queensland: Queensland University of Technology, Vol. 1. p. 187-192

## **Engagement/activities**

### **Project Manager ISO PWI 23726-1 Ontology-based interoperability standard - Fundamentals**

Hodkiewicz, M. (Speaker)

1 Jun 2024

**Member of Standards Australia Committee EL-069 on 'Automated Systems and Integration'**

Hodkiewicz, M. (Consultant)

17 Mar 2022 → ...

**Board Member MRIWA (Minerals Research Institute of Western Australia)**

Hodkiewicz, M. (Consultant)

1 Feb 2022 → 1 Feb 2023

**Engineering for Change: Renewable and Future Energy**

Broadhurst, T. (Speaker), Gaudin, C. (Speaker), Bienen, B. (Speaker), Aman, Z. (Speaker) & Hodkiewicz, M. (Speaker)

30 Sept 2020

**Board Member of NOPSEMA - National Offshore Petroleum Safety and Environmental Management Authority**

Hodkiewicz, M. (Consultant)

1 Mar 2017 → 1 Nov 2022

## **Prizes/awards**

### **ATSE**

Hodkiewicz, M. (Recipient), Oct 2020

### **Fellowship of ATSE (Academy of Technological Sciences and Engineering)**

Hodkiewicz, M. (Recipient), 1 Nov 2020

### **Finalist in the Australia/ NZ Women in AI awards 2022 for Manufacturing category**

Hodkiewicz, M. (Recipient), 31 Mar 2022

### **MESA Medal**

Hodkiewicz, M. (Recipient), 1 Dec 2016

### **UWA Faculty of Engineering Award for Individual Teaching Excellence**

Hodkiewicz, M. (Recipient), 1 Sept 2013

### **Visiting Fellow - Alan Turing Institute**

Hodkiewicz, M. (Recipient), 1 Feb 2018