



AUSA NanoSafety Group Newsletter

Welcome!

Dear AUSA NanoSafety Group members,

Welcome to the Issue 6 NanoSafe newsletter! We have been excited to see many of our group members at the conference in Hobart this year. This issue is generic and includes contents of the presentation by Xin and Julie, focusing on ENM risk management. We hope you enjoy reading it!

Xin, Julie and Maria

Group News

In June, we welcomed four new members to the group. Please join us to welcome

- [Matt Connolly](#), Manager, Health Safety & Environment, Faculty of Science, Engineering and Build Environment, Deakin University
- [Raffaele Timpano](#), Faculty Safety Coordinator, Faculty of Science, Engineering & Technology, Swinburne University of Technology
- [Jaime MacDonald](#), Health and Safety Advisor, University of Canterbury
- [Charles Nelson](#), Chemical Safety Officer, UniSA

The 2017 AUSA Conference was held on the 20—22 June in Hobart. Xin and Julie co-presented a plenary session on risk management of nanosafety and assessment tools. This is included in the next section.

For group membership enquiries, please contact [Xin](#) directly.

Nano Safety Risk Management Framework and Assessment Tools

In this newsletter, we decided to include a section on our combined presentation for those members who were unable to attend the conference.

The presentation was started with Julie’s talk on the background information about nano safety, any potential hazards associated with engineered nanomaterials and applicable legislation. This lead to Julie’s identification of a gap in current knowledge of nanomaterials and hence the importance of exposure assessment. To date there are no known human studies on the health effects of nanomaterials, however animal studies have shown development of the following health effects:

- Pulmonary (lung) inflammation
- Fibrosis (a build-up of scar tissue in the lungs that makes it hard to breathe)
- Mesothelial (asbestos like) tumours in the lungs
- The health effects of carbon Nano-tubes (CNT’s) and structures of CNT’s that are not fibre-like in shape may also be hazardous.
- The potential for bioaccumulation

Curtin University has developed an exposure assessment tool that can be used to facilitate researchers on risk assessing the level of exposure to the hazard, i.e. Nanomaterials (special thanks to other Universities across Australia who provided information that assisted with the development of this document). This Risk Assessment is required to be completed by all staff and students at Curtin University who intend to use, manipulate and/or produce Nanomaterials within their teaching or research activities. It must be provided to their Manager/Supervisor for approval and to Health and Safety for ongoing monitoring of facilities and project types being undertaken on campus.

A copy of the assessment tool is attached to the newsletter email and also uploaded onto the [group’s portal on AUSA’s website](#). If you are interested in using the exposure assessment tool or would like to discuss this tool further, please forward your enquiry to [Julie Hitchens](#), Senior Health and Safety Advisor, Curtin University.

The second part of the presentation focused on the risk management framework on nano safety management. Xin asked the audience whether the ISO 31000 Risk Management Framework is sufficient in managing risks associated with unidentified hazards and criticised the risk matrix approach. To put it simply, the risk matrix is unable to asses the appropriate level of risk with unknown hazards and this could show a priority in the risk ranking which would not be a true reflection of the risk.

Three risk management frameworks were then critically discussed at the presentation. The [Groso et.al. \(2016\) model](#) specified its use within research laboratories. This model looked at the hazards of the parent bulk materials and classified the corresponding engineered nanomaterials (ENMs) into three levels (Fig. 1). Then for ENMs at each level, their usage activities are assessed into four nano levels with recommended controls. The problem with this risk management framework is that it is too complicated for a risk manager or WHS professional to follow and it did not show its scientific justification.

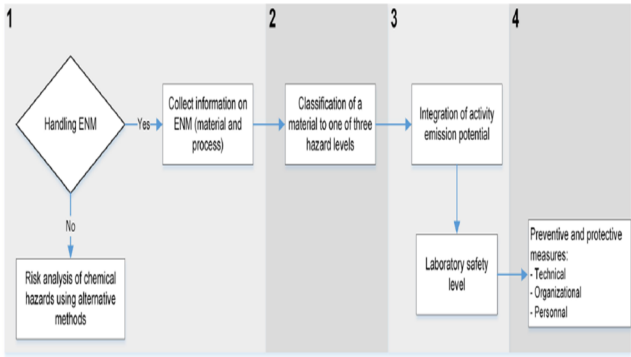


Fig. 1 Groto (2016) risk management framework

Further, recent developments in grouping and read-across in the European Union provided additional thinking. [DF4nanoGrouping Framework](#) (2015) was developed so that properties of similar ENMs can be grouped together into 4 Main Groups (Fig. 2). The groups are then risk assessed, rather than the individual ENM. This certainly provides new thinking for the development of local risk management frameworks and the system included pre-assessed risks associated with each groups as well as a nano-hotspot to prioritise the local focus. However, the system is too conceptual and would require specialist advice on using the system, i.e. can be quite costly if these parameters are to be tested to give accurate risks.

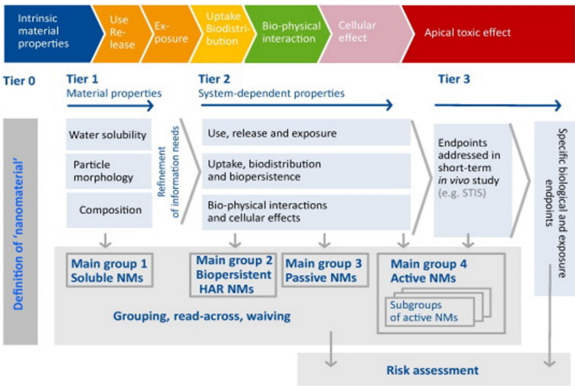


Fig. 2 DF4nanoGrouping (2015) risk management framework

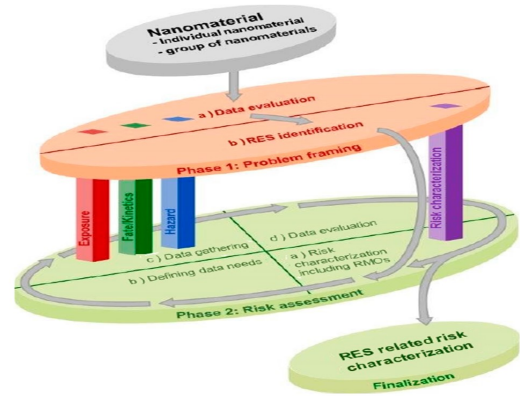


Fig. 3 MARINA (2015) risk management framework

In addition, the [MARINA Risk Assessment Strategy](#) (2015) is another key development in ENM risk management. It incorporated risk ranking and data collection into the framework as well as being the only one which considered exposure route as an indicator to mitigate risk (Fig.3). However, the recommended control from its risk assessment tool is either elimination or further testing which is not very practical.

Contributions

Our next newsletter will move back to general nano-safety topics and control banding. Please email your suggestion/contribution to [Xin](#), [Maria](#) or [Julie](#) by November 30, 2017 for inclusion.



Reference

Groso, A, Petri-Fink, A, Rothen-Rutishauser, B & Hofmann, H 2016, 'Engineered nanomaterials: toward effective safety management in research laboratories', *J. Nanobiotechnol.*, vol. 14, no. 21, pp. 1-17.

Bos, PMJ, Gottardo, S, Scott-Fordsmand, JJ & Van Tongeren, M 2015, 'The MARINA Risk Assessment Strategy: A Flexible Strategy for Efficient Information Collection and Risk Assessment of Nanomaterials', *Int. J. Environ. Res. Public Health*, vol. 12, pp. 15007–15021.

Arts, JHE, Hadi, M, Irfan, MA & Keene, AM 2015, 'A decision-making framework for the grouping and testing of nanomaterials (DF4nanoGrouping)', *Regul. Toxicol. Pharmacol.*, vol. 71, pp. 1-27.