



## SAFENANO in a Nutshell

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**Director Strategic Consulting IOM, and Director of**  
**SAFENANO**

The following Feature is not an article, but a presentation given recently by SAFENANO's Director Rob Aitken.

In it, Rob discusses the background and aims of SAFENANO, describes the features available on [www.safenano.org](http://www.safenano.org), and describes the next phase of SAFENANO's development - provision of services.

The presentation encapsulates SAFENANO's ethos, and serves as an excellent 'potted guide' to the Initiative as a whole.

To read the presentation in full, please see overleaf.





Stephen Cash, CEO of NanoCentral (Introducing Rob):

"In bringing together some of our key providers in this first part of the conference, I feel the next one is really key to our long term survival. I believe that the industry has to take very seriously concerns about health and safety, toxicology, and that it behoves all of us to behave in a responsible manner. Just as we have tried to bring together experts in the field how to make particles, what I am going to do now is ask Dr Rob Aitken to come and tell us a little bit about how the Institute of Occupational Medicine can help us in establishing best practice, providing us with some of the information that will go at least part way to allaying public fears."

# Supporting industry

- Nanotechnology is likely to generate great benefits for industry and for the population in general
- To realise its full potential it is essential that it is developed in a safe and responsible way to prevent undesired adverse effects in workers, consumers and the environment or unjustified concerns about these issues
- SAFENANO can help industry to achieve these goals by understanding and managing RISK

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Good afternoon ladies and gentleman, thanks Steven for that introduction and the opportunity to talk to this company. My name is Rob Aitken, I am director of what's called the SAFENANO initiative.

SAFENANO is one of the 22 DTI nanotechnology centres in the UK. We have been tasked with provision of safety, environmental and health support for DTI, their facilities, and the UK nanotechnology industry. All of the talks so far this morning have been very keen to stress health safety and environmental issues so I think I am speaking to a receptive audience today.

The aim of what SAFENANO is trying to do is very much supporting industry. We have seen here that we are all very well aware of the potential benefits of Nanotechnology, but we feel and I think the industry feels that it is essential that it has to be developed in a safe and responsible way so to prevent adverse effects on workers, consumers or the environment, and also to prevent unjustified concerns about these issues. Indeed, this is another issue that we all have to face - we have to be reasonable and realistic about what we know and what we don't know and where the gaps are. So, our role really at SAFENANO is to try to help industry achieve these goals by understanding and managing risk.

# SAFENANO - IOM

SAFENANO  
will provide  
independent  
advice and  
support  
concerning the  
potential RISKS  
to the  
environment and  
human health  
from  
nanomaterials



**Institute of Occupational Medicine  
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**Independent, Authoritative, Impartial  
Research, Consulting, Services**

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SAFENANO is a project funded by the DTI, but it's based at the IOM (Institute of Occupational Medicine) in Edinburgh. The IOM as an organisation has been involved in particle risk issues since its inception about 40 years ago, working with a wide range of industries on materials that were new and innovative at that time. Originally, we were formed as part of the coal industry, and so we gained a great understanding of potential risks from coal particles, and subsequently worked with a whole range of other industries including asbestos, glass fibre so we have a strong core history of working with particulate materials.

Importantly though, the IOM is not just a academic organisation, we are an organisation who also deliver commercial services so I think that on balance, our history, understanding of the issues and the service concept we hold makes IOM a very good place for SAFENANO to be based.

There is an important word which I have picked on in a couple of places on this slide - 'independent' I think this is key to dealing with the risk issues faced in nanotechnology. If people are looking for work, help, support, in these there is a real statement that needs to be made about the independence about the work that gets done.

I think the general public needs to have an understanding that the risk research is being done in an open and constructive way and independence, authority, and partiality are key values held by the IOM.

So in our view SAFENANO will provide independence and advice support concerning the potential risks to environment and human health from Nanomaterials.

# A few words about RISK

- Exposure to particles can cause health effects
  - industrial and environment examples
- Key questions
  - how toxic is the material
  - what is the exposure, how intense, how long, how widespread
- Without exposure there is no risk
- All of us have a duty to assess, understand and manage the risks from our processes and products

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I have mentioned risk a couple of times so I just want to say a few words about it now.

I have made a very bold statement which I think is important that people take on board: "exposure to particles can cause health effects". There are many examples of this: examples from industry where we have seen the development of lung diseases from coal dust and from asbestos fibres, and environmental examples where PM10 in particular is considered to be one of the primary drivers of cardiovascular disease or death by cardiovascular events arising from air pollution. So, we do have to take on board that the issue of Nanoparticle risk that has to be faced is not something that's been spun together by a group of academics.

There are key questions which we need to think about and need to answer. For example, Which particles do and which particles don't cause health effects and under what conditions do particles cause health effects etc. The work that we are doing at SAFENANO/IOM is to try and help find the answers to at least some of these. I think that there are two key questions:

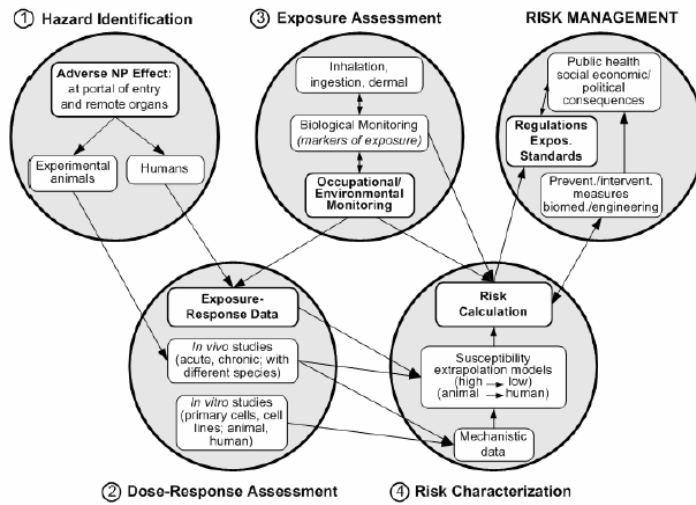
The first is how toxic is the material? Is its toxicity attributable to any one inherent characteristic of that material, how toxic is it, and what harm does it cause?

The second question is what is the exposure? How much are people exposed to, for how long, at what level and how wide spread is that exposure?

In almost every discussion I have it is the second question that in some ways tends to get a little overlooked in the debate, so I am very keen to bring it to peoples attention when I can. After all, an important point to bear in mind is that without exposure there is no risk: any toxic material that's just kept on a shelf in a bottle and locked away in a cupboard would present no risk - no one would become ill because of that material. So, if we can understand exposure, and control exposure, we can manage the risk.

I think all of us, all academics, manufacturers and users of these materials have a duty, which is enshrined in law, to assess, understand and manage the risks from the processes and products we use. This is what we are trying to help with at SAFENANO.

# Hazard, Exposure and Risk



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This is a fairly complex diagram, and I won't try to explain it all but what it basically does is describe the inter-relationship between hazards (how toxic a material is) and exposure (people being exposed to a material and the management of this). You can see there a whole number of steps in this, and really I think what we at SAFENANO are interested in doing is managing effectively the risks.

It's certainly the case that you don't need to fill in all the gaps on the diagram in order to get an effective risk management approach. Indeed you can have that without really knowing very much about the material, but the more gaps you can fill in the more effective your risk management will be.



In terms of SAFENANO, there are three elements to what we are trying to do:

One is delivery of information about what the risks are.

The second is a community approach in which we are going to encourage people to talk together to find collective solutions.

The third is a series of services that we can provide that will help you in your own work environment with your own products to understand and mitigate the potential risks. I will just say a little bit about each of these.

The information delivery part of SAFENANO is really about trying to capture the emerging scientific evidence about the potential risk of these materials and to interpret, disseminate and comment on it in such a way that it turns from what can be seen as academic exercises about toxicity into real useful tools for managing risk.

Therefore the core of what we are really trying to do is try to collect, explain and to disseminate that information.

# SAFENANO Information

- Website
- News
- Reviews
- Regulation
- Features
- Interviews
- Guidance
- Best practice
- Database
- Helpdesk
- Bulletins
- Newsletter



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Our primary tool for this really is a new website, SAFENANO, which will become live in its fullest form soon, so this is our kind of pre launch introduction.

The various features you will find on this website include: various news articles, listings of upcoming events, reviews of work that has been carried out, a gathering together of published information about regulation as it develops, various feature articles from industrials and others about the work they are doing in relation to risk litigation and there approach to that, podcasts of exclusive interviews, and alerts to various forms of guidance as it emerges.

There are already a number of guidance documents for safe handling Nano materials which are in production, and indeed there are some which are already out there. Through SAFENANO we will pull these together to allow comparison, and provide some commentary on how these maybe used, how effective they are etc.

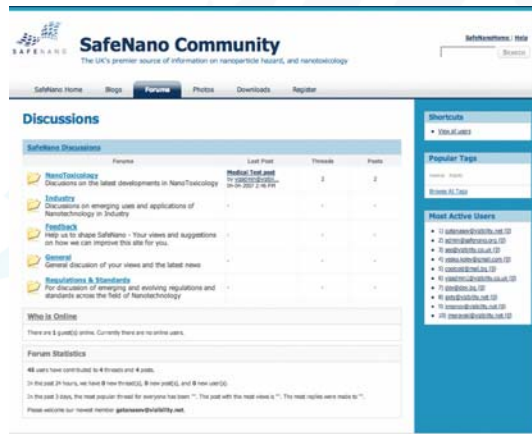
There will be a database of current scientific literature on the topic which will be brought together in a searchable form. In addition, there will be a help desk, where you can raise and have answered questions relating to risk.

There will also be a series of bulletins, where we can update those who register with our site, and a downloadable news letter - indeed the first edition of this is already available online.

Basically SAFENANO is an information site and we hope ultimately will become The resource that people come to for information about Nanomaterial risk issues.

# SAFENANO Community

- Discussion groups
- Forums
- Threads
- Opinions
- Blogs
- A shared approach



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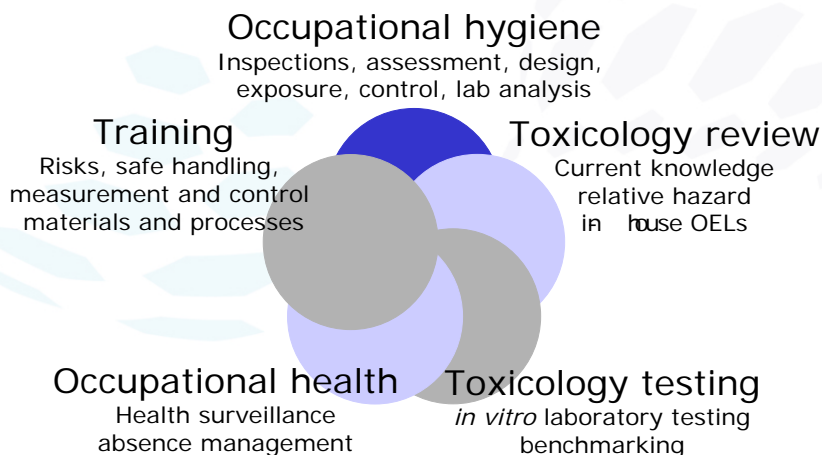
The second part of SAFENANO's provision is what we have called our community site. It is part of the overall provision and is integrally linked to the main website but it has a slightly different feel to it.

What we are trying to encourage within the SAFENANO community site is discussion between people who are trying to address Nano Risk issues to see if they can find some common solutions.

Within this community we envisage a number of forums where scientists, industrialists and government affiliated workers can meet to exchange or publish information about what they have done to control risks in their area of work for mutual benefit. For example we have an industry forum where workers in this field may discuss developments, exchange information and express their views on the latest developments in their area.

The reason we have gone down this route is that we are keen to move away from a position where people give out information and expect it to be done exactly as written, when very often restraints of the real world prevent this from happening. We are therefore trying to encourage some kind of involvement in the development of Risk management processes, and we think that the Community will be helpful towards reaching more practicable solutions that people can work with. So, I would encourage you to join in with this and contribute to what we are calling a shared approach to finding solutions to the issues.

# SAFENANO Services



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The final part of the three elements are Services. As I said at the start of the talk, the IOM is an organisation that's providing services of this type of industry now in a whole range of issues. What we hope to do with the next phase of our DTI report (which is under negotiation as we speak) is to tune these services a little more towards Nano issues. At this stage all of the services on the slide are available in some form so I'll say a little bit about the kind of things we do.

The first service on the slide is Occupational Hygiene. This includes inspection of work sites, assessment of the effectiveness of control, support towards design of processes etc. measurement of exposure in work places and laboratory analysis. This is a core part of the IOM's business, and is very important I think to those who are involved in the Nano materials business.

The second element is Review Activities: toxicology review - gathering together the current knowledge about a particular material or process, gauging the relative toxicity of that material in relation to other known materials, and possibly using information from this review to develop in house occupational exposure limits appropriate to the material.

Going beyond this and into Toxicology testing, we move into a regime where there really is not sufficient knowledge, and additional testing to determine the toxicological hazard of materials is definitely required. What we have available at the IOM and what we will have available is a benchmarking *in vitro* toxicology approach which will enable you to rank the toxicity of your materials in relation to other materials.

Occupational health of course is very important, through IOM and SAFENANO we can offer health surveillance, absence management processes etc. I think at this stage there is a real need to bring together information about the people who are working in this industry; with the exponential new development nanotechnology is seeing, many people are coming into the industry and the Occupational Health of these people is something which we at the IOM as Occupational Health professionals would like to see tracked a little better.

And finally training which I think is very important to everybody - making sure that your staff understand what the risks are, what the safe handling procedure are, information about the materials processes etc.

So these are the kind of services we envisage being developed to the full with DTI's support.

THANK YOU

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[www.safenano.org](http://www.safenano.org)



S A F E N A N O

Finally, I would encourage you to contact us, and let us know what you think about these processes, what you think about we are trying to do, and encourage you to interact with SAFENANO by registering with the website once it becomes available.

Thank you very much.