

**Dragon, Karen E. (CDC/NIOSH/EID)**

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**From:** Bill Kojola [Bkojola@aficio.org]  
**Sent:** Friday, February 18, 2011 10:53 AM  
**To:** NIOSH Docket Office (CDC)  
**Cc:** Niemeier, Richard W. (CDC/NIOSH/EID)  
**Subject:** Comments Docket Number NIOSH 161-A  
**Attachments:** AFL-CIO Comments CIB CNT NIOSH 161-A.pdf

NIOSH:

Attached are the comments of the AFL-CIO on the draft NIOSH CIB on carbon nanotubes and nanofibers, docket number NIOSH 161-A.

We appreciate the opportunity to comment on this important document.

Regards,

Bill

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February 18, 2011

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**RE: Docket Number NIOSH 161-A, Draft Current Intelligence Bulletin  
"Occupational Exposure to Carbon Nanotubes and Nanofibers"**

Dear Sir or Madam:

The AFL-CIO appreciates the opportunity to provide comments on the draft Current Intelligence Bulletin, "Occupational Exposure to Carbon Nanotubes and Nanofibers". We are quite pleased that NIOSH has initiated this document. This is a very important and welcomed effort by NIOSH to identify two engineered nanomaterials that pose a risk to exposed workers and to recommend exposure controls and other measures designed to protect workers. We fully support this initiative and recommend that NIOSH finalize this CIB as quickly as possible so that it can be implemented in workplaces where exposures to carbon nanotubes (CNT) and nanofibers (CNF) exist.

Overall, we believe this draft CIB is a sound and scientifically well reasoned document that reflects our current understanding of the scientific literature regarding carbon nanotubes and nanofibers. We have several comments and suggestions below that we believe, if incorporated into the final version, will enhance its strength and effectiveness in protecting workers.

## **Rationale For Issuing The CIB**

The initiation of this CIB is based on an evaluation of existing animal toxicology studies that have identified carbon nanotubes and nanofibers as having adverse health effects following exposure routes that are relevant to exposures that workers experience. The animal studies have identified these substances as hazards and consequently, they are predictive of the likelihood of causing harm in humans as well. This is the real value in performing animal studies in advance of any evidence of adverse health effects in humans – by raising the level of concern about the likely impact on workers and taking steps in the workplace to reduce and control exposures in response to animal evidence. The AFL-CIO agrees with this approach and supports the issuance of this CIB.

As the executive summary correctly states in its lead sentence, there are no human studies that provide evidence of adverse health effects. However, there exists ample evidence from animal studies that these substances can produce serious adverse consequences following exposure. That animal evidence alone is sufficient for NIOSH to issue this CIB. While it is important to mention the absence of human evidence, NIOSH should not lead with such a statement because it undercuts both the rationale for issuing this CIB and the importance of taking precautionary action in the workplace to protect workers based on the evidence we have on hand at this point in time.

## **Risk Assessment and Recommended Exposure Limit (REL)**

The CIB employs well established health risk assessment methodology using animal data to assess risk to exposed humans that form the basis for the NIOSH recommended exposure limit (REL) of 7  $\mu\text{g}/\text{m}^3$  elemental carbon. We believe this approach is appropriate at the present time given the limitation in our current understanding of the health consequences in animals and the REL, which is set at the current upper limit of quantitation (LOQ) of the existing mass-based analytical method for assessing exposure.

Substantial risk to human health remains at the REL, however. While we recognize this remaining substantial risk, we support the REL as a provisional limit. We would urge NIOSH to add some discussion to the CIB on why this REL ought to be considered "provisional". That discussion would cover the significant risk at the REL, the use and limitations of using mass per volume exposure metrics for engineered nanomaterials, other exposure metrics and analytical methods that may be more appropriate for carbon nanotubes and nanofibers (particles or fibers per volume, surface area, influence of metals etc.), and the absence of chronic animal inhalation exposure studies.

We would further urge NIOSH to strongly recommend that a vigorous research effort be undertaken in the critical areas that intersect with developing a

protective REL. That research would include determining the most appropriate exposure metric, improving the analytical method(s) for assessing exposure, determining the most sensitive exposure metric for expressing adverse health consequences, and additional animal toxicology studies that should be conducted. We would hope, with advances in new research, that NIOSH would commit to quickly revisit this CIB and issue a revised REL that more adequately protects workers as new evidence warrants.

Finally, because there is significant risk to workers at the proposed REL, NIOSH must emphasize in the CIB that employers must implement control measures that keep exposures well below that of the REL. The REL must not be viewed as some bright line to be achieved – instead, employers should seek to keep exposures as low as possible.

### **Worker Training**

Adequate and effective worker training is an essential component of any comprehensive effort to protect workers from hazards in the workplace. We believe the training elements of the draft CIB needs to be reorganized and expanded.

In the draft CIB, a very limited amount of worker training language appears as one element in the medical screening and surveillance section (6.6) of the recommendations chapter (Chapter 6). In our view, the worker training element of the CIB needs to exist as a stand-alone recommendation within Chapter 6 – placing it in the medical screening section implies that training would only be provided to those workers who are included in the screening program. In our view, this is inappropriate - all workers who are potentially exposed to CNT and CNF must receive training and not just those included in the medical screening efforts of the employer. The purpose of training is to engage those who are potentially exposed so that those workers are aware of the risks resulting from exposure and the measures that are being used to control exposure and reduce risk. Only a separate section on training in the recommendations chapter will achieve this objective and we urge NIOSH to adopt this suggested change in its final CIB.

At a minimum, the CIB should recommend that the stand-alone worker training section identify a comprehensive set of elements that need to be included in a worker training program. Those elements should include, at a minimum, the following topics: (a) hazards, risks and routes of exposure of CNT and CNF; (b) operations/materials/processes/tasks where CNT and CNT are present and where potential exposure exists; (c) exposure assessment strategy and NIOSH REL; (d) role and effective use of exposure control measures, including engineering, workpractice, and PPE measures; (e) emergency/process upset/clean-up procedures; (f) objectives and procedures of the medical

screening and surveillance program; and (g) importance of handwashing, showering and changing clothes.

### **Medical Screening and Surveillance**

We applaud NIOSH for including a medical screening and surveillance in this CIB. The AFL-CIO, along with other labor and environmental organizations, has long argued in support of establishing medical screening for workers potentially exposed to engineered nanomaterials. We believe it is appropriate and important for NIOSH to include this provision in the final document, especially given the hazard and risk information that we currently have on CNT and CNF.

The draft CIB proposes to include workers in the medical screening program only those who are exposed to CNT or CNF at concentrations in excess of the REL "or" workers in areas or jobs who have the potential for intermittent elevated air concentrations to CNT or CNF. We believe these criteria for inclusion into a medical screening program are too restrictive and we recommend expanding the population of workers who would receive screening. As NIOSH has documented in this CIB, significant risk of adverse health consequences remains at exposure levels below the REL. Thus, the REL is not a "safe" exposure limit. Consequently, we believe that medical screening should be made available to all workers who are potentially exposed to CNT or CNF – not merely to those workers who experience exposures in excess of the REL or those who experience an undefined "intermittent elevated" or episodic exposure. Expanding coverage of the worker population included in the medical screening program as we recommend will, in our view, capture workers who may also be at risk of adverse health effects over those whose exposures are intermittent or exceed the REL. Our recommendation is more protective and precautionary than that in the draft CIB and we urge NIOSH to adopt our suggestion in the final document.

We also believe that the surveillance aspect of this CIB needs to be strengthened by stressing the importance of employers following groups of workers over time who are exposed to CNT and CNF and those who have been included in the medical screening programs. NIOSH should also consider establishing a national exposure registry and health surveillance program. These long-term surveillance efforts will be crucially important for carrying out future studies to assess health effects among exposed populations of workers.

### **Labeling Products**

It has been our experience that many workers have no knowledge as to whether or not the products or materials they work with contain engineered nanomaterials. This is a major impediment to addressing hazards posed by these materials and implementing measures designed to protect workers from

exposures. To confront this problem, we would like to see NIOSH recommend in the CIB that all products containing CNT and CNF should be properly labeled. Labeling is a fundamental component of any comprehensive approach to ensuring that workers and employers understand that there is exposure potential depending on how the product is used throughout its life cycle – and that implementing measures to control those exposures is essential if workers are to be protected.

The AFL-CIO is very pleased that NIOSH has taken the initiative to issue the CIB on CNT and CNF. We strongly support the issuance of a final document as quickly as possible due to the rapid development of nanotechnology and the need for providing effective guidance on how to control exposures and protect workers. While this document is confined only to CNT and CNF, including an REL based on a sufficient animal toxicology data, we think NIOSH ought to consider issuing a document addressing all engineered nanomaterials and the measures necessary to effectively protect workers. By doing so, NIOSH will assist in establishing a precautionary framework to help assure that workers will not experience adverse health effects from all nanoproducts.

Sincerely,



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