

### A risky global experiment

I must disagree with Gerald Crawford's letter in the March/April issue on global warming ("We're not to blame," p. 8). Like him, I am writing as a self-appointed group (of one), and offer my views for consideration.

He reasons that a 3 per cent increase in CO<sub>2</sub> emissions will result in a 3 per cent increase in atmospheric CO<sub>2</sub> levels. This is true only if the rate of removal adjusts itself, automatically and instantaneously, in direct proportion to the atmospheric concentration. He presents no evidence whatsoever to support this (unstated) assumption.

In fact, the IPCC (Intergovernmental Panel on Climate Change) report of 2001 clearly states that the cumulative increase in atmospheric CO<sub>2</sub> amounted to about 61 per cent (1980-1989) and 51 per cent (1990-1999) of anthropogenic emissions. If we must make some assumption based on the limited evidence, the reasonable one seems to be that the natural carbon cycle self-adjusts to deal with about half of anthropogenic CO<sub>2</sub> emissions. If this is indeed the case, and we maintain current levels of emissions, we will see an ongoing increase in atmospheric CO<sub>2</sub> of around three billion tons of carbon per year, causing an increase of 25 per cent in atmospheric carbon after 30 years. Of course, if emissions continue to increase, atmospheric carbon will accumulate even faster.

I cannot prove that my reasoning (or anyone else's) leads to a correct estimate of future CO<sub>2</sub> levels; in fact, I disagree with the statement in the IPCC summary that increasing CO<sub>2</sub> levels are definitely caused by human actions. I claim only that, based on the available evidence, there is a distinct possibility that we are altering the climate significantly.

This leads to a point that has been largely overlooked in the debate, that of burden of proof. We are so used to the legal concept of "innocent until proven guilty" that we forget that technologies aren't people. Technologies don't have

rights, and where the environment is concerned they must be considered "guilty until proven innocent."

No drug company can put a new drug on the market without rigorous testing. We would never accept the argument that we should license an untested drug and take no action until someone proved that the drug was causing illness or death. Yet Mr. Crawford seems to think that this practice is acceptable when every living creature on the planet may be at risk.

On the face of it, the strategy of doing nothing until we have more data might appear reasonable. However, since carbon emissions are at unprecedented and ever-increasing levels, we can't even claim that we're currently doing nothing. We're running an experiment on a global scale, with no proof whatsoever that it won't end in disaster. Proponents of emission reductions are in effect saying, "Let's stop running this crazy experiment."

We should undertake aggressive measures to put a lid on emissions. Not because we know so much, but because we know so little.

*Robert M. Thomas, P.Eng., Godfrey, ON*

### Who's right? Who's wrong?

I want to respond to Gerald A. Crawford's letter, "We're not to blame" (*Engineering Dimensions*, March/April 2007, p. 8). Mr. Crawford claims that the executive summary of the first Intergovernmental Panel on Climate Change (IPCC) report in 1990 concluded that climate change is caused by anthropogenic (human caused) CO<sub>2</sub>, contrary to the substance of the original report and to the idea that the group has an "environmental agenda."

I'm sure Mr. Crawford is aware that the IPCC has issued three more reports since 1990, each reaching the same conclusions. Mr. Crawford's charge that the summaries of these reports are not supported by their contents is false. The *conclusions* (not only the scientific content) of the Third Assessment Report, issued in 2001, were refereed twice by

440 reviewers and overseen by 33 editors, before being approved by delegates of 100 countries. The Fourth Assessment Report, issued recently, was the culmination of the work of 900 scientists, and reviewed by 2500 of their peers. The IPCC reports represent a massive body of scientific evidence that concludes that the Earth's climate is changing, and human activities are "very likely" the cause.

Mr. Crawford also states that human-induced climate change is a "whitewash" and that the "six billion" tons of anthropogenic CO<sub>2</sub> generated annually is insignificant compared to the 210 billion tons of CO<sub>2</sub> generated naturally. In fact, according to the US Department of Energy, 26 billion tons of CO<sub>2</sub> were generated by humans globally in 2004. But actual figures aside, comparing two numbers and concluding that humankind's contribution is comparatively small and of no concern is an oversimplification of the issue. It neglects the fact that CO<sub>2</sub> is long-lived in the atmosphere: about 56 per cent of all CO<sub>2</sub> generated by the burning of fossil fuels is still in the air. Also, there are positive feedback loops at play. For example, CO<sub>2</sub> is a trigger for an important greenhouse gas: water vapour. As the atmosphere warms, it retains more moisture, and the net effect (after considering clouds reflect some energy back to space) is an escalation of the planet's temperature.

In fact, the rise in atmospheric CO<sub>2</sub>, coinciding with the Industrial Revolution, is unprecedented. Prior to the 1800s, there were about 280 parts per million (ppm) of CO<sub>2</sub> in the atmosphere. Today the figure is 380 ppm. Scientists have extracted a three-kilometre-long ice core in Antarctica that spans a million years of Earth's history. It has been demonstrated that until recently the CO<sub>2</sub> levels never exceeded 280 ppm in that time.

But, for all this evidence, science is rarely 100 per cent certain and there is still a chance that the majority of climatologists in the world are incorrect.

What are the consequences if Mr. Crawford is correct, and we proceed on a path to reduce CO<sub>2</sub> emissions “needlessly”? More fuel efficient and alternatively powered vehicles? More energy-efficient homes, industry and cities? Better mass transit systems? Making alternative technologies better and cheaper so that the developing world does not repeat the mistakes of our industrial revolution?

And let me ask Mr. Crawford: What are the consequences to future generations if you are wrong and we fail to act?

*Peter J. Moore, P.Eng., Markham, ON*

### Pictures are worth 1000 words

I found the picture on pages 62-63 of the March/April 2007 issue of *Engineering Dimensions* to be inappropriate for an organization attempting to elevate the status of professional engineers.

The picture would suggest that engineers are the labourers who build and install infrastructures. To my mind, it would have been desirable to have something that promotes the concept of engineers as the designers of machinery and infrastructures. I do not know what should have been the picture, but I do know that what was presented did not impress me as representing what is done by engineers. In fact, it may be suggesting that those who install machines should be applying for PEO admission.

*A.F. Barnard, P.Eng., Dundas, ON*

### Invalid reasons

Requiring pre-engineering studies, a master's degree, or increasing the number of years to five or more just because other professions are doing it is not a valid reason for PEO to do it (“Bringing engineering into the 21st century,” *Engineering Dimensions*, May/June 2007, p. 3). What was it my mother used to say? “Just because your friends jump off a cliff and break their legs is no reason for you to jump off, too.”

And increasing the registration requirements because there is a glut of engineers is also not a valid reason. It seems to go contrary to the spirit of the *Professional Engineers Act* as self-serving rather than public-serving. Higher than needed restrictions lead to artificial shortages, which

lead to higher engineering costs to the public for engineering services (higher salaries to engineers).

No, the only valid reason to increase registration requirements is if the current requirements are failing the public. Are we registering incompetent engineers? Are we registering inadequately trained engineers? If the answer is yes, the requirements must be raised; if not, no change is required.

*David Moffat, P.Eng., Toronto, ON*

### Thanks for wasting my time

Now that PEO's belated attempt to have Bill 124's provisions reversed has met with some success, I am looking forward to David Brezer, P.Eng., (program director with the Ministry of Municipal Affairs and Housing) sending me a cheque for the time and effort I wasted in doing the following:

- studying, for one week solid, the entire *Ontario Building Code* (OBC);
- paying for, and writing for three hours apiece, a total of five building code exams; and
- paying for registration as a “design firm” with the ministry.

I am sure that, as a fellow P.Eng., Brezer will be attending to those items on behalf of me and my fellow P.Engs with the same degree of enthusiasm with which he oversaw the administration of that woefully troublesome program. I assure him I will find some useful means of distributing the cash.

*Michael E. McCartney, P.Eng., BDS  
Toronto, ON*

### A disturbing trend

I have read your recent articles on the subject of international engineering graduates and seen the ads on TV, but I think that a more honest and frank discussion is required.

First let me say that I am not against licensing qualified international engineering graduates and I have had one in our office who was qualified and was working towards receiving his licence. However, I am very concerned that PEO is bowing to government pressure to license foreign trained engineers who do not have the skills or knowledge that is appropriate. We are structural consult-

ants and I have interviewed and had many international engineering graduates in our office over the past few years. Only about 10 per cent had the abilities and skills that I would expect from a Canadian engineering graduate. Let me briefly describe the last two.

1. This gentleman was an international engineering graduate with about 10 years' experience in design and consulting and was granted EIT (engineer-in-training) status from PEO. He had only to complete one year of experience to get his licence. He was in our office for one month. He had little or no knowledge of the *Ontario Building Code* (OBC) or CSA material design codes. Further, we could see that his knowledge of the principles of structural analysis was very limited and he was unable to design even the simplest of structures.
2. We only interviewed the second gentleman. He was an international engineering graduate and was granted his licence by PEO a year or so ago. He had been working for a surveying company and wanted to get into consulting. He apparently did most of his training in structural analysis and had about six years' experience in his own country as a project engineer/manager with some limited design experience. He had no knowledge of the OBC or CSA material design codes. He apparently had to take one or two courses as part of his licensing process and one was in structural analysis.

In my view, both gentlemen and, particularly the second, seem to indicate a disturbing lenient trend to licensing at PEO. Both people have neither the knowledge nor skills to practise professional engineering in Ontario. Yet, one is close to being licensed and the other is licensed. One can imagine the second person being hired by a designer who has a BCIN but needs an engineer to stamp his drawings. That is a recipe for a potential disaster for public safety. I am not completely happy with Bill 124 but if ever there was a case that would demonstrate that the government has to protect the public by adding another layer of certification because PEO is not ensuring that

licensed engineers have knowledge of the OBC, the second person is it.

The reality is that we must not forget the culture that these graduates are coming from. Sadly, in many countries of the world, the expected norm is lying, cheating and corruption. We can downplay and not mention it, but it is true. Therefore, one can expect that a percentage of the graduates may not have the training or ability that their educational status or degree indicates.

I think that we must have a more rigorous testing program to ensure that licences are given only to those who have the equivalent engineering skills and ability as a Canadian engineering graduate. I believe that the American NCEES system would be a good testing model to emulate. We must ensure that licences are given only to those who can demonstrate that they have knowledge of Canadian and Ontario design and building codes. We can continue to rely on the Ministry of Housing to actually do that, but I am sure that it would be preferable to all of us and more efficient for international engineering graduates to be tested by PEO. If PEO does not tighten the licensing standards, the licence will be devalued for all Ontario engineers and, ultimately, public safety will be reduced.

*Don Ireland, P.Eng., Brampton, ON*

## Enough of the noise

In the May/June issue, Robert Stevens, P.Eng., and Marshall Chasin, AuD, have brought to the attention of the members a very important and significant event relating to the safety and health of Ontario workers (“Tougher legislation for workplace noise exposure,” *Engineering Dimensions*, p. 62). They have done a very good job of presenting the gist of the latest amendment to the Ontario *Regulation for Industrial Establishments* (Reg. 851, section 139), as well as to the *Regulation for Oil and Gas—Offshore* (Reg. 855, section 41). As the title of the article indicates, the regulations that govern the exposure of Ontario workers to noise in their workplaces have been significantly toughened. The amendment should be of particular interest to professional engineers in Ontario, since it clearly places the onus on employers to reduce noise exposure of employees “without requiring them to use and wear personal protective equipment,” unless they can substantiate that such controls are “not reasonable or not practical to adopt.” There are a few other very narrow exceptions, and it should be pointed out that the relative cost between providing hearing protection or using engineering controls is not one of them, unless the employer can demonstrate that the cost is prohibitive and hence not practical. These are some of the issues which will undoubtedly be clarified by legal challenges to the directions that the ministry inspectorate will likely be issuing based on this amendment.

I would like to point out that one of the key changes in the new regulation truly vindicates the efforts of Dr. Edgar Shaw of National Research Council Canada, who, in a monograph published in the mid-1980s, argued brilliantly that the 3-dB rule is the most logical choice for measuring and limiting noise exposure. It is a pity that successive governments failed to act earlier on this matter, and it took nearly 25 years to see it come to fruition. Now, it is truly up to the employers to face up to their new responsibilities and act according to the spirit of the law. It is also up to the unions to oversee the actions of employers and push hard to make this legislation work. I am sad to say that leaving it up to the government on this issue is not a wise choice. I congratulate the Hon. Steve Peters, minister of labour, for taking the initiative and passing this vital piece of legislation.

*Baily Seshagiri, PhD, P.Eng., Ottawa, ON*

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