The Boice Report #47

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May the *Mass x Acceleration* Be With You! NRC and RIC

NRC Commissioners, clockwise from upper left: Stephen Burns, Kristine Svinicki, Jeff Baran, William Ostendorff
Photo courtesy of NRC

I must be one of the last persons to see *Star Wars*. When I left the theater, a health physicist greeted me by saying, "May the mass times acceleration be with you." I like corny jokes, which appear to be a hallmark of the U.S. Nuclear Regulatory Commission (NRC) Regulatory Information Conferences (RIC) held each year in March. This year, the RIC featured the four NRC commissioners, who made themselves available for questions and informal discussions. The sessions included many that a health physicist would enjoy, e.g., Human Capital Challenges in Health Physics chaired by Terry Brock.

Chairman Burns. NRC Chairman Stephen Burns gave the keynote speech on the regulatory craft—where craftsmen strive for sound policy and sound science, to be good stewards of the resources provided (Project Aim 2020), and to be trusted. The overarching goal of regulation is to ensure public health and safety without unduly burdening those being regulated. NRC's Principles of Good Regulation include independence, openness, clearness, reliability, and efficiency. The public wants to be engaged in discussions of adequate protection, reasonable assurance, and assessments of risk—all in an atmosphere of trust. But trust can be elusive since craftsmen make mistakes. So vigilance and flexibility are paramount for success.

Chairman Burns mentioned Supreme Court Justice Stephen Breyer's 1993 book, *Breaking the Vicious Circle: Toward Effective Risk Regulation*. Regulators must assess risks and then manage them. The public's view on risks often differs considerably from that of experts. The lay public put nuclear power at the top of a list of perceived risks while experts ranked nuclear power 20th out of the 30 listed risks, well behind car accidents, handguns, smoking, and police work. Says Breyer, "When we treat tiny, moderate, and large risks too much alike we begin to resemble the boy who cried wolf." This difference in risk perception has existed for decades and it's disheartening that it still remains today. Better education about radiation can affect perception. *One of the commissioners was a bit tired. He was reading a book on antigravity the night before and couldn't put it down.*

Commissioner Sviniki. A highlight for me is Commissioner Kristine Svinicki. She talks about life, the challenges of regulating, interactions with fellow commissioners, and literature—we read the same books! This year it was Melvin Urofsky's *Dissent and the Supreme Court*. David Cole wrote: "The majority prevails, but the dissenter's role is by far the more romantic; it is the work of the individual who, on principle, stands against the crowd . . . We assign authority to the majority, but we valorize the dissenter . . . Except when we don't." History, not rhetoric or cogency, determines whether a dissent wins out in the long run. Yet by articulating a compelling vision, a persuasive dissent can contribute to the art of historical change. It is apparent that the commissioners disagree, but they do so with civility and respect and without vitriol or personal attacks. Shouldn't we be so motivated when discussing our scientific issues that are often polarizing? *A photon checked into a hotel and the receptionist asked whether he had luggage. The photon responded: No, I'm a light traveler.*

Commissioner Ostendorff. Commissioner William Ostendorff came from a career in the nuclear navy and is exceptionally skilled scientifically and in management principles. This was his final talk as he retires this summer and will return to the U.S. Naval Academy. *An atom ran into the bar and yelled to the bartender that he lost an electron. The bartender responded, "Are you positive?"*

Commissioner Baran. Commissioner Jeff Baran worked for the U.S. House of Representatives for 11 years. He stressed the need for external scientific knowledge to be the foundation of recommendations and regulations. I spoke with him briefly about improving the scientific basis for health studies with the Million Person Study that includes 300,000 NRC licensees. *What is the favorite meal of a British health physicist? Fission chips, of course!*

Human Capital Challenges in Health Physics (NRC RIC, March 2016), left to right: William Magwood (Nuclear Energy Agency), Richard Toohey (MH Chew), Jerry Hiatt (Nuclear Energy Institute), Kathryn Higley (Oregon State University), and Terry Brock (NRC) Photo courtesy of John Boice

Where Are the Radiation Professionals (WARP)? An entire session on the nation's human capital needs was a preview of this year's National Council on Radiation Protection and Measurements (NCRP) Annual Meeting, 11–12 April. Kathy Higley began essentially with: "Houston, we have a problem!" The nation is at a tipping point. The schools are closing and there will not be enough teachers to fill the need, even if future market forces can be brought into play. If the ground is fallow, planting wheat won't yield a harvest. We need "cooperation and cash" now from the federal government, agencies, societies, and philanthropists to stem the tide of decline.

Dick Toohey summarized the NCRP WARP initiative and reminded us that Dade Moeller and Ralph Eliassen had predicted shortfalls in health physics graduates 40 years ago in 1976. Society memberships are in decline, and jobs are not forthcoming. We need a "back to the future" revival—to simply restore the circumstances of not that many years ago when jobs were plenty, growth was apparent, and enthusiasm and optimism abounded. Things are not so rosy today. The use of radiation continues to increase, whereas the number of radiation professionals continues to decrease. One telling quote came during the 2012 NCRP Annual Meeting after the Fukushima incident: "The response to an accident 8,000 miles away stretched the capabilities of the U.S. government to, and in some cases beyond, the breaking point."

Jerry Hiatt discussed industry's approach to training so that the supply of technologists will meet demand. Educational programs for two-year degrees have expanded to more-advanced degrees. The Nuclear Uniform Curriculum Program appears successful in meeting the needs for technicians, although there are recognized shortages for short periods during refueling, and filling the so-called supplemental positions remains a challenge. Health physics positions seem stable at the moment, related to delayed retirements, current (not necessarily future) graduates, and the shutdown of facilities. The aging workforce is recognized and there is a concern about knowledge transfer. Recently I learned that the situation in Japan is worse in that critical needs are not being filled because of a troubling shortage of workers in the post-Fukushima Daiichi era. The issues of nuclear power are broad, and NCRP will hold a workshop on nuclear power at the Health Physics Society midyear meeting, 22–25 January 2017 in Bethesda, Maryland. *There are three kinds of people in the world: those who understand binary and those who don't.*

Former NRC Commissioner William Magwood. As the cleanup hitter, Commissioner Magwood provided an international perspective, which ended on a pessimistic note. A Nuclear Energy Agency survey of needs in 10 member countries concluded: "Organizations in many countries are struggling to fill needs for radiation protection specialists—the situation appears likely to get worse in the coming years." The general view: there are simply not enough qualified radiation professionals.

In many of our newsletters, columns, and statements, we are raising the clarion call, but I fear that while we are speaking loudly, no one may be listening. Ever the optimist, though, I end with a quote from Ronald Reagan that Commissioner Svinicki used at the end of her presentation.

> I've seen what men can do for each other and do to each other. I've seen war and peace, feast and famine, depression and prosperity, sickness and health. I've seen the depth of suffering and the peaks of triumph and I know in my heart that man is good, that what is right will always eventually triumph, and that there is purpose and worth to each and every life.

I hope he's right, don't you?