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## Opinion: Defending the Independence of HF/E Science

*By Raja Parasuraman, Peter Hancock, Robert Radwin, & William Marras*

The Bush administration has recently sought to impose a political agenda on the deliberations of science in general and human factors and ergonomics (HF/E) in particular. This is a matter that should be of concern to all researchers and practitioners in our field. In this article, we describe certain disturbing developments that collectively threaten the independence of the science of HF/E.

The goal of politics is the pursuit of justice through the exercise of shared power. The goal of science is the search for empirical truth. In principle, politics shares that goal. In theory, science informs public policy decisions that are legislated; in practice, politicians often focus on the exercise of shared power. As a result, many feel that science and politics should be kept separated as much as is feasible, as in the separation of Church and State. Yet, in the past, political decisions have been made that were contingent on information derived from the scientific state of the art.

At the same time, scientific study is not possible without drawing on the popular purse: the taxpayer's dollar. Much as some would like to maintain a pristine separation between science and politics, there is inevitable interaction, which must therefore be monitored carefully. As scientists, we are often loath to do this, for it means leaving the ivory tower of academia to sample the perceived muddy waters of politics.

Recent events indicate that we must do so. The events are troubling because they endanger the independence of the science and practice of HF/E. Our purpose here is not simply to apprise HFES members of these developments but to solicit your active response to this situation, which we believe represents a dangerous trend that must be systematically opposed.

In science, the degree to which one's opinion is influential is (or at least should be) contingent on how one's ideas and notions conform to testable reality. Politicians sometimes create the reality for themselves, and the power of opinion is contingent on just that – power. Many examples over the centuries, such as the inquisition of Galileo and the famines foisted by Lysenko, point to the tragic outcome when power seeks to impress its opinion on reality. It is up to scientists to bring this recipe for disaster before the public eye.

### A Dangerous Trend

As described in the journal *Science* (Ferber, 2002), the current administration has engaged in political screening of appointees to peer review study sections that evaluate the scientific merits of research proposals on HF/E issues in the workplace. A major funding source for HF/E research is the National Institute for

Occupational Safety and Health. Proposals are reviewed by its different study sections, which include those that examine occupational injuries. The Department of Health and Human Services, which oversees these efforts, has been accused of partisan actions. Specifically, “the department has rejected three people who were proposed by science administrators at the National Institute of Health (NIH) which manages the study section – ‘at least one’ for her support of an ergonomics rule that was overturned last year by the Bush Administration.”

The article identifies these individuals and further discusses the process of “screening” whereby potential study section members were quizzed as to their political opinions prior to appointment – or not. These activities strike at the heart of scientific independence. The concern would not be that great if this was an isolated incident, but that is not the case (Rosenthal, Berndt, Donohue, Frank, & Epstein, 2002). There is now mounting evidence of systematic attempts to insinuate political opinion into scientific deliberation.

As one might imagine, this has become an extremely controversial issue, with allegations and counteraccusations (see Weiss, 2003). However, when prestigious scientific journals such as *Science* and the *New England Journal of Medicine* express significant concern, one sees the HF/E issue as only one among many threats to the impartiality of scientific information. The editors of *The Lancet* have also warned against the “growing evidence of explicit vetting of appointees to influential [scientific] panels on the basis of their political or religious opinions.”

Our concern is with the precedent that such actions sets. If these trends are allowed to continue, it is clear that science in this country will not be influenced by appropriate evaluations that are consistent with the scientific process but, rather, will evolve to become an appendage to the opinion of whatever political faction temporarily holds sway.

When political pressure infiltrates the peer review process by excluding otherwise qualified scientists because of their political views, by “stacking the deck” with only those scientists who support the current administration's political agenda, the scientific process becomes contaminated. Such single-sided bias in the selection of scientific juries inhibits the greater good of the pursuit of knowledge and suppresses scientific inquiry in certain areas by making political agendas part of the scientific review.

The poet W. H. Auden wrote,

The belief that politics can be scientific must inevitably produce tyrannies. Politics cannot be a science, because in politics theory and practice cannot be separated, and the sciences depend upon

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# Strategic Planning Day: An Executive Council Priority

By Betty Sanders, HFES President

I am pleased to serve as president of the Human Factors and Ergonomics Society for 2003–2004. Periodically during my term, I will be communicating with you via the *HFES Bulletin* on issues that I feel are important and on which I would appreciate your input. This first article highlights recent updates to the Society's Strategic Plan and an invitation to become more involved in advancing this great organization and our profession.

The HFES Executive Council (EC) consists of six officers and six members-at-large elected to three-year terms. The EC convenes at least twice each year to review and develop budgets and plans consistent with HFES short- and long-term objectives. Recently, the EC adopted a new Operating Rule that institutionalized the current practice of devoting a full-day event at the midyear meeting focusing on the HFES Strategic Plan (SP). An important responsibility of the president-elect, which was my position at midyear 2003, is to plan and lead this event.

The 2003 Strategic Planning Day occurred on April 24 in Santa Monica, California, at which EC members were joined by Douglas Harris and William Howell, two appointed members of the Policy and Planning Committee. This year SP Planning Day focused on accomplishing two tasks: revision of the current SP by clarifying, updating, and reprioritizing its goals and objectives; and clarification and establishment of a stronger EC leadership role in the generation and implementation of actions that support the plan.

Evidence of successful completion of the first task is the following revised strategic plan.

## REVISED STRATEGIC PLAN (April 24, 2003)

### Purpose, Vision, and Mission

**Purpose:** We promote and advance through the interchange of knowledge and methodology in the behavioral, biological, and physical sciences the understanding of the human factors involved in the design, manufacture, and use of machine systems and devices of all kinds.

**Vision:** We envision a widely shared science, philosophy, and practice that adapt technology to enhance human performance and to improve the quality of human life.

**Mission:** Our mission is to help our members advance and promote the science, philosophy, and practice of human-centered design.

### Strategic Goals and Objectives

**A. Education and Training Goal:** Promote the teaching of HF/E science, philosophy, and practice.

#### Strategic Objectives

1. Anticipate and prepare members for the future requirements and issues of human-centered design.
2. Identify and help fill important gaps in available teaching and self-study materials.
3. Provide forums for continuing education of HF/E professionals.
4. Provide forums in which non-HF/E professionals can get specialized HF/E training.
5. Provide forums in which students can get specialized HF/E training.

**B. Peer Networking Goal:** Promote the evaluation and exchange of information among HF/E researchers, educators, and practitioners.

#### Strategic Objectives

6. Produce materials in which HF/E researchers, educators, and practitioners can present their work, knowledge, and ideas to the HF/E community.
7. Provide forums through which HF/E researchers, educators, and practitioners can interact.

**C. Outreach Goal:** Promote the exchange of information between HF/E professionals and those who need our services.

#### Strategic Objectives

8. Advance the level of knowledge about HF/E among nonmembers.
9. Promote the sharing of information and interaction with nonmembers.
10. Advance and promote the understanding and appreciation of user-centered design among the general population.
11. Ensure that human-centered design principles are incorporated into industry standards and government regulations that significantly affect human performance and quality of life.
12. Ensure that HF/E professionals are included in committees, boards, commissions, panels, or other bodies that provide advice and guidance to government agencies and industries on issues affecting human performance and quality of human life.
13. Translate and promote the use of HF/E principles from data into forms (such as tools and guidelines) usable for analyses, design, and evaluation.
14. Actively solicit information from outside the profession that can benefit or enhance the discipline and membership.

**D. Organizational Excellence Goal:** Serve and represent the members as the premier scientific, engineering, and practice society.

#### Strategic Objectives

15. Enhance HFES decision making, resource management, and member services to support strategic objectives.
16. Pursue ongoing improvement and understanding of the unique attributes of HF/E.



## Bulletin

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17. Develop leadership and member involvement at all levels of the Society.
18. Provide leadership within the discipline at the international level.

For a historical perspective, a copy of the SP adopted in 1996 appears on page 357 of the *HFES 2003–2004 Directory and Yearbook*. It is important to note that even though the plan has undergone several modifications during the past seven years, the mission continues to focus on member services, professional representation, and human-centered design. Changes reveal a more inclusive (rather than exclusive) perspective of the field, and less emphasis is placed on defining HF/E as a unique discipline and articulating its boundaries. Rather, the revised SP emphasizes the sharing and exchanging of information, knowledge, and methodology. This is supported by language in the objectives that suggests a more diverse membership base and that encourages outreach to nonmembers in educational and promotional endeavors.

After revising the SP, and with the guidance and support from At-Large Member Nancy Larson and Executive Director Lynn Strother, the EC utilized a simplified Quality Function Deployment (QFD) matrix process to accomplish the second task noted above, strengthening the EC's leadership role. This task engaged the participants in several interrelated activities. First, EC members assigned priority, importance, and urgency measures (rating scale: 0, 1, 2, and 9) to the revised set of strategic objectives based on their relevance to the goals (educational/training, peer networking, outreach, and organizational excellence). The results of the exercise suggest that the goals are discrete and that each set of objectives appropriately supports its goal. The objectives of providing forums and producing materials for HF/E professionals were rated more important and more urgent than the other objectives.

EC responsibilities are divided into seven subcouncils: Communications and Publications, Corporate Activities, External Relations, Internal Relations, Member Services, Professionalism, and the HFES Institute. SP Planning Day participants were asked to assess the Society's current activities while exploring the relationship between the objectives and the subcouncils. As a group, participants also generated a matrix of ratings that illustrates the extent to each objective-subcouncil relationship is supported by (1) sufficient, (2) insufficient, or (3) no current activities. The purpose of this exercise was to determine whether the current structure of the EC is appropriate to address identified objectives. All objectives were linked to at least one of the subcouncils; therefore, the outcome verified that the structure is appropriate.

Then, the Council members broke up into small subgroups, led by subcouncil chairs, to generate examples of current activities, future actions, and creative ideas to support the plan. Each subgroup documented its results in oral and written reports that were shared by all. The purpose of this task was to establish leadership responsibility (based on the Executive Council structure) for future implementation efforts. The brief summaries that follow highlight a few significant actions and ideas communicated in the subcouncil reports.

*Communications/Publications Subcouncil:* (1) The HFES Web site could be used more effectively to communicate technical infor-

mation not readily available, such as videos of outstanding presentations and panel discussions at annual meetings. (2) Free copies of *Ergonomics in Design* could be sent to segments of the general public, such as doctors and business and government leaders, to educate nonmembers and to encourage affiliation, collaboration, and cooperation.

*Corporate Activities Subcouncil:* (1) The annual meeting format could be expanded to provide more forums for the education and interaction of members and nonmembers. (2) Government activities and other information relevant to HFES concerns could be solicited, tracked, and reported.

*External Relations Subcouncil:* (1) The development and identification of workshops, short courses, and distance learning opportunities for nonmembers could be implemented and offered at HFES and other professional meetings. (2) Content linkages to and from the HFES Web site could be used to expand relationships and share resources between members and nonmembers.


*Internal Relations Subcouncil:* (1) Leadership forums and workshops could be developed for national and local distribution to members (particularly students). (2) Access and exposure to newly elected HFES officers and leaders could be increased.

*Member Services Subcouncil:* (1) Current members could be more involved in efforts to increase attendance and participation at annual meetings. (2) Members could be acknowledged for increasing and retaining enrollment at all levels of the organization.

*Professionalism Subcouncil:* (1) The Web site and other venues could be used to make available self-study materials. (2) HFES could cosponsor existing short courses or collaborate with others in the development of new courses for members and nonmembers.

*Institute Subcouncil:* (1) Efforts to identify critical HFES questions and issues that need to be addressed by standards, guidelines, and research could be expanded. (2) Publication of a series of best practices guidelines for distribution to members and nonmembers could be a high priority.

### **Call for Volunteers**

The primary task of this administration is to evaluate and possibly implement some or all of the suggestions listed above and to extend an invitation to all HFES members to get involved in that process. HFES has a small, competent, and committed central office staff, but most of the goals and objectives outlined in the Strategic Plan will have to be accomplished by volunteers. This task is achievable because core members of HFES are capable individuals with versatile talents and interests that could be tapped to support the Society in this effort. However, the current cadre of staff, officers, and committee members cannot do it by themselves – they need fresh recruits with energy and enthusiasm. If that sounds like you, please let this administration hear from you. Volunteerism Committee Chair Ron Shapiro will collect your responses and incorporate them into a database that has been established for this purpose. To volunteer for HFES activities, please send a message to Ron (rshapiro@us.ibm.com) or committee members Margarita Posada (margaritaposada@optonline.net) and Kim Sherman (ksherman@sandalwood.com). 



## HFES Position on Initiative 841

The following statement was distributed to Washington state newspapers and posted at the HFES Web site in response to a November 4 ballot initiative to repeal the state's ergonomics regulations. The position statement follows:

The Human Factors and Ergonomics Society (HFES) urges voters in the state of Washington to consider the sound science behind ergonomics when they vote on Proposition 841.

HFES is the largest organization of human factors/ergonomics scientists, engineers, and practitioners, representing 4800 members in the United States and from countries around the world. HFES supports the development and application of scientific and engineering principles that help to prevent and protect workers from musculoskeletal disorders (MSDs), as well as those that enhance workers' comfort, safety, and productivity.

HFES is concerned about the prevalence of MSDs in the workplace. It is the HFES position that there are well-established principles and a solid foundation of practice that demonstrate the efficacy of ergonomics interventions to prevent MSDs. This knowledge base, developed over the past 60 years, provides more than sufficient understanding to enable the occurrence of MSD problems in the workplace to be addressed effectively. This knowledge base is presented in numerous textbooks and refereed journal articles representing efforts of the engineering, medical, and public health schools of the nation's most prestigious universities as well as the laboratories of many of the nation's major companies. Application of this knowledge is accepted and common practice.

HFES believes there is clear scientific evidence of associations between work-related MSDs and workplace risk factors and that ergonomics programs and specific ergonomics interventions can reduce the occurrence of MSDs. Studies by the National Academy of Sciences and the General Accounting office have substantiated that ergonomics programs in industry result in fewer MSD-related injuries. This leads to an improved bottom line for companies that incorporate sound ergonomics programs due to lowered disability, workers compensation, and liability claims. HFES supports continuing investigation into the most effective ways to implement ergonomics programs in industry but believes that existing knowledge substantiates both the value and efficacy of such programs in maintaining and improving worker health, safety, comfort, and productivity.

## 2004 Dues Renewal

The 2004 dues renewal packets will be in the mail soon, and we thank you in advance for renewing your membership for 2004. Your dues help HFES support your professional needs; increase our outreach to government and business leaders; improve the quality of HFES publications, products, and services; and ensure uninterrupted delivery of *Human Factors*, *Ergonomics in Design*, and the *HFES Bulletin*. Renew early to save \$15 on postage

surcharge fees. Please help us conserve our resources by renewing by January 31, 2004.

Included in the dues renewal packet is a request to update your contact information. Simply log in at the Members-Only area of the <http://hfes.org> and submit your change of address via the Member Directory. Remember that you can create your own password after logging in with your five-digit membership ID number. You may also submit updates by phone (310/394-1811) or fax (310/394-2410). Member information updates received by January 31, 2004, will be included in the 2004-2005 HFES *Directory and Yearbook*, to be mailed around April 1. ☒

## HUMAN FACTORS

### Joint Special Issue of *QSHC* and *Human Factors*

By Eduardo Salas, *Human Factors* Editor

Submissions are invited for a special section of *Human Factors* and *Quality and Safety in Health Care* entitled "Linking Human Factors and Health Care: Techniques for Improving Patient Safety." Eduardo Salas of the University of Central Florida and Paul Barach of the University of Miami/Jackson Memorial Hospital, editors of *Human Factors* and *QSHC*, respectively, will edit the section.

In recent years, patient safety has become an international agenda, requiring that professionals from numerous domains – including human factors, industrial engineering, and medicine – explore and improve the current state of patient safety in the health care community. Each year, hundreds of thousands of patients are killed and millions are adversely affected worldwide because of medical errors. This joint issue will provide health care and human factors professionals with an opportunity to combine good science with good research so as to identify techniques to reduce these errors. We are seeking theoretically driven papers that are research-, application- (e.g., interventions to promote patient safety), or practitioner-based (e.g., case studies) and that focus on the human factors of patient safety.

Papers on all aspects linking human factors to patient safety are welcome. Papers addressing the following research questions include, but are not limited to,

- How can medical errors be reduced using human factors techniques?
- How can training for individuals and/or teams be used to improve patient safety?
- What training strategies can reduce human error in complex medical domains?

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## Opinion: Defending the Independence of HF/E Science

(continued from page 1)

their separation.... Empirical politics must be kept in bounds by democratic institutions, which leave it up to the subjects of the experiment to say whether it shall be tried, and to stop it if they dislike it, because, in politics, there is a distinction, unknown to science, between Truth and Justice.

In this short article we cannot examine all the ramifications of the issue, but we wished first to bring the seriousness of the situation to the membership. Simple protest may be insufficient. One important question that emerges is, "What can HFES as a professional society do in the face of these developments?" The corollary is to examine what individual concerned scientists can do about such growing infringements.

### A Path Ahead

Our aim in this article has been simply to point out the threat to the independence of the science of HF/E. We wish to allay the fears of any members by categorically stating that we are not engaged in a partisan effort. Our concern here is not with one particular administration as compared with another: We should protect the independence of science regardless of the stripe of those who hold political power. Whenever this threat arises, it is the responsibility of all scientists to protect the purity of the process as much as is possible – not in response to the momentary vagaries of any one political situation but for the fundamental betterment of all.

In large part, politicians come from a background in law, where precedent holds significant sway and all is open to dispute. Science shares some of these characteristics. However, in respect to certain fundamental properties of reality, scientific knowledge is sufficiently sure that disputes, though always still possible, are largely puerile. An argument in science is judged not by its polemic qualities but by the degree to which it accords with empirical evidence. Correspondingly, policy decisions should also be made in accord with the consensus scientific evidence, not simply by fiat.

HFES and all HF/E professionals in general would do well to monitor how other organizations are addressing this matter. For example, the Public Policy Office of the American Psychological Association has examined some of the issues concerning the appointment of scientists to advisory boards and study panels. The General Accounting Office (GAO) is also conducting an ongoing investigation of the issues surrounding appointments to advisory councils. It has defined three researchable questions that will guide their investigation: (1) What is the role of advisory councils government-wide in helping shape policies and regulations? (2) What policies and procedures are in place to ensure that advisory councils provide balanced advice? (3) Are there any improvements to be made in those policies and procedures?

The GAO report, due in January 2004, will provide recommendations pertaining to the questions and may identify some of the actions that could be taken to avoid future allegations of inappropriate vetting of scientific advisors seeking appointment to advisory panels. Individuals with information relevant to this issue may wish to contact the GAO as it conducts its investigation. As these and other organizations look at the issues more closely, procedures for ensuring that future scientific appointments are made in a fair and politically neutral way may emerge (Kennedy, 2003).

## In Conclusion

The suppression of empirical truth in any form is anathema to science. When science is invoked to inform public decision making, the critical premise is that no such suppression has occurred. Attempts to pervert scientific input and promote partisan interests may succeed on a very brief time scale. This could accrue through the control or banning of dissenting opinion (see Michaels et al., 2002). However, the long-term costs of such a strategy are catastrophic. History tells us that the empires of the past have fallen in ever shorter time frames.

The position of leadership that the United States holds in the world is predicated on its technical superiority and is founded on its preeminence in scientific achievement. Political interference in the process of scientific arbitration, though possibly viewed by certain politicians as a pragmatic necessity, is a sure recipe for disaster. There is no quicker way for America to lose its status in the world than to poison the wells of science. The actions that have been taken by the present incumbents and noted here are sadly evident of this miscalculation. It is hoped that the collective voice of HF/E professionals can dissuade those in power from this tragic course.

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## NEWS

### Internship Program Accepting Applications

The Christine Mirzayan Science & Technology Policy Internship Program of the National Academies is accepting applications for 2004 sessions. The program is designed to educate graduate science, engineering, medical, veterinary, business, and law students in the study and creation of science and technology policy. Through the program, students can develop skills valuable in the transition from graduate student to professional. Applications for the summer program are due *March 1, 2004*.

To learn more about the program, go to [http://www7.national-academies.org/internship/About\\_Internship\\_Program.html](http://www7.national-academies.org/internship/About_Internship_Program.html). ☉

## Human Factors

(continued from page 4)

- What evaluation techniques are available? What techniques are needed for improving patient safety?
- How can simulations be used to improve patient safety?
- How can we better design patient safety systems (macro- and/or microsystems)?
- How can human factors analyses be applied to medical systems?
- Are there performance advantages of technology? What are they?
- What is the impact of organizational and safety cultures on patient safety?
- What human factors-based recommendations can be provided for improving medical work spaces?
- What educational needs (human factors-based) are there in health care?
- What are some human factors methods for identifying problematic areas in patient safety?
- How can lessons learned from other communities serve to improve health care?

### Submission Information:

The deadline for submission is *January 15, 2004*. These special issues are different from most in that they are a joint effort

between the *QSHC* and *Human Factors*, so appropriate reviewers from each discipline will be used. Authors are asked to select **one** journal to which they would like to submit their article. Reviewers will be selected from both disciplines, and the editors will make joint decisions on all submitted papers. Based on the author's journal selection, submissions should be submitted following the guidelines specific to that journal. Extended summaries of articles accepted for publication in *Human Factors* will appear in the *QSHC* special issue. Extended summaries of articles accepted for publication in *QSHC* will appear in the *Human Factors* special section.

Please follow the submission rules for *QSHC* at <http://qhc.bmjournals.com/misc/ifora.shtml> or *Human Factors* at <http://www.hfes.org/publications/humanfactorsguide.pdf>.

Manuscripts intended for publication in *Human Factors* should be sent to:

Special Section, Patient Safety  
Editor, *Human Factors*  
Human Factors and Ergonomics Society  
P.O. Box 1369  
Santa Monica, CA 90406-1369  
USA

Submissions may be sent electronically to *QSHC* at <http://submit-qhc.bmjournals.com/>. In your cover letter, reference Special Issue, Patient Safety/joint Human Factors/*QSHC* issue. ☒

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Opinions expressed in BULLETIN articles are those of the authors and should not be considered as expressions of official policy by the Human Factors and Ergonomics Society.

**FLASH!**

## IMPORTANT DATES

**2004 dues renewals are due**

**January 31, 2004**

Member information updates received by  
January 31, 2004, will be included in the  
2004–2005 *HFES Directory and Yearbook*.

**Proposals for the 2004 Annual**

**Meeting are due February 9, 2004.**

Watch [hfes.org](http://hfes.org) for the Call for Proposals.



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