BOARD OF CERTIFICATION IN PROFESSIONAL ERGONOMICS

THE PROFESSIONAL ERGONOMIST

The Newsletter of the BCPE

Board of Certification in Professional Ergonomics • P.O. Box 2811 • Bellingham • Washington • USA • 98227-2811 • Phone (360) 671-7601 • Fax (360) 671-7681 • e-mail: BCPEHQ@aol.com • http://www.bcpe.org

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ACCREDITATION AND RE-CERTIFICATION

by Robert J. Smillie, Ph.D., CPE
BCPE Secretary

When BCPE was formed in 1990, the Board and the organizing committees were dedicated to establishing a formal, consistent standard process to certify ergonomists. In an effort to ensure that the process maintains a high standard, the Board is considering seeking accreditation from nationally recognized organizations. Accreditation is a process in which an independent organization of experts determines if established standards have been met. For BCPE, accreditation will demonstrate that the BCPE certification process has been reviewed by a panel of impartial, competency experts.

BCPE is already a member of the National Organization for Competency Assurance (NOCA). NOCA is committed to excellence in voluntary certification. NOCA "… advocates and advances quality practices in competency assurance to serve the best interests of certificants, employers, and the public" (NOCA Handbook, 1996). NOCA develops standards, evaluates methods for assuring competency, disseminates results of competency assurance research, and recommends polices for certifying organizations. NOCA membership comprises more than 150 organizations, a broad spectrum ranging from medical to health and safety.

Competency is the cornerstone of the BCPE certification process. Competency, however, is not static. Competency requires individuals to constantly expand their knowledge base by updating their current skills and learning new skills and techniques. BCPE Directors believe that we do not serve the public interest, or the interest of our certificants, if we do not take steps to assess continued competency. According to the National Commission for Certifying Agencies, "The competent practitioner performs work accurately and in the best interest of the consumer, makes correct judgments, and interacts with other professionals and customers effectively. Competence must be demonstrated and maintained throughout the individual's practicing life" (NOCA Handbook, 1996).

BCPE agrees with the general practices promoted by NOCA. In addition to NOCA, BCPE is aware of and follows the principles of the Council of Engineering and Scientific Specialty Boards (CESB), which is dedicated to competency assurance in engineering and related fields. Both NOCA and CESB require a structured re-certification process as part of any accredited certification program. BCPE is also working with other ergonomics organizations, in particular the International Ergonomics Association (IEA), to ensure that the certification criteria for ergonomists are rooted in competency. In 1997, the IEA endorsed certification standards including re-certification which requires defining a specific period for currency and a process for maintaining currency.

Initiating a re-certification process for our certificants will facilitate national accreditation of the BCPE certification process. Meeting the criteria of NOCA and CESB certifying commissions would result in several benefits. Perhaps most notably, it will ensure impartial and outside review to assure established certification standards are met, enhanced credibility of the BCPE certification program, and national recognition of CPEs/CHFPs and CEAs.

The remainder of this article describes the re-certification process and defines the various categories established for meeting the re-certification criteria. Comments on this process are solicited.

The Re-certification Process

After careful analysis of other certification programs and consideration of the opportunity, as well as the availability for certified ergonomists to maintain competency, BCPE is in the process of establishing a Re-certification Program based on a point system. As currently planned, the Re-certification Program would require certificants to earn 25 points every five years. These points are earned from the categories given in Table 1 (on pages 2-3).

A strategy for initiating the re-certification process could be one where the clock for the cycle for earning the points would start on the date when the next Maintenance Fee is due. Thus, the cycle will vary for each certified ergonomist. Subsequent cycles would be every five years after the first cycle. For all individuals certified after the beginning of the initial cycle, the re-certification cycle would start on the date the individual is first certified.

Re-certification deadlines would be printed on the annual Maintenance Fee renewal notice. In addition, a re-certification worksheet would be sent at the start of the re-certification cycle. The finished worksheet would then be mailed when the cycle is complete (five years) along with the Maintenance Fee for that year. The BCPE Re-certification Committee would randomly select a sample of worksheets for each cycle year for audit. If part of the audit sample, the certificants would be required to provide support documentation. It would be important for all CPEs/CHFPs and CEAs to maintain complete and accurate records of all professional development activities, e.g., receipts for attendance at qualified ergonomics meetings, continuing education certificates, references for work verification, etc.

TABLE 1. RE-CERTIFICATION POINT CATEGORIES

CATEGORY	DEFINITION	MAX. POINTS per YEAR	MAX. POINTS per 5-YEAR CYCLE
Active practice as a certified ergonomist.	A practicing certified ergonomist will accumulate 2 points for every year of full-time practice/work. A certified ergonomist who only works part-time will accumulate 1 point for every year if the work is, at least, half-time.	2	10
Professional membership in ergonomics and ergonomics-related societies.	A certified ergonomist who is a member of a professional society, e.g., HFES, ES, APA Division 21, or the ergonomics section of a Technical Group of a related society will accumulate 1 point for every year of membership. Multiple memberships within a parent organization are not counted, e.g., being a member of a Local Chapter of HFES, and being a member of one of the HFES Technical Groups, and being a member of HFES accumulates only 1 point per year of membership.	1	5
Committee service in ergonomics and ergonomics-related societies.	A certified ergonomist who serves as a volunteer, either appointed or elected, for an ergonomics or an ergonomics-related organization* will accumulate points for every year of volunteer work in accordance with the following: • Serving on a committee or task group . . . . . .1 pt • Chairing a committee or holding an elected office . . . . . .2 pts Individuals who serve in multiple capacities (e.g., someone who serves on one standing committee and chairs another, or someone who is an officer of a Technical Group and also serves on a standing or special committee) will accumulate one additional point.	3	15
Publishing ergonomics and ergonomics-related articles and papers.	A certified ergonomist who publishes ergonomics related material will accumulate points according to the following breakdown: • Refereed paper or book chapter . . . . . .2 points, if first author • Refereed paper or book chapter . . .1 point, if one of several authors • Paper/article in other publications . . . . . .1 point, if first author • Paper/article in other publications . . . . . .one-half point, if one of several authors • Author of a book . . . .5 points • Co-author of a book . . . . . .2 points • Editor of a book . . . . . .2 points • Co-editor . . . . . .1 point	NO LIMIT	NO LIMIT
Chairing/co-chairing ergonomics meetings.	A certified ergonomist who chairs or co-chairs a session at a professional society meeting will accumulate one-half point for each chairing/co-chairing	NO LIMIT	NO LIMIT
Contributing questions to the CPE and CEA examinations.	A certified ergonomist who contributes examination questions will accumulate 1 point for five multiple choice questions and 1 point for a scenario and question set. Questions submitted must be accepted for actual use in the examination item pool for the CPE/CHFP or the CEA to accumulate points.	NO LIMIT	NO LIMIT
Serving as a proctor for the CPE and CEA examinations.	A CPE/CHFP for the CPE/CHFP or the CEA examination or a CEA who proctors for the CEA examination will accumulate one-half point for each proctoring.	NO LIMIT	NO LIMIT
Conference attendance at an ergonomics-related meeting.	A certified ergonomist who attends a professional society conference that is directly related to ergonomics (i.e. a substantial portion of the conference covers ergonomics) will accumulate 1 point for attendance and an additional point for presenting a paper or serving as session discussant.	NO LIMIT [Maximum number of points for any one conference is 2.]	NO LIMIT [Maximum number of points for any one conference is 2.]
Continuing education credits.	A certified ergonomist who attends educational or academic courses that are directly related to ergonomics will accumulate points according to the following breakdown: • Half-day course (3 hours of instruction) . . . . . .in accordance with standardized CEU procedures. • Full-day course (6 hours of instruction) . . . . . .1 point • Academic course (full semester) . . . . . .2 points	NO LIMIT	NO LIMIT

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TABLE 1. RE-CERTIFICATION POINT CATEGORIES *(continued from page 2)*			
Teaching ergonomics courses.	A certified ergonomist who teaches an academic course (covering an area that is directly related to ergonomics, e.g., Ergonomics survey course, Biomechanics, etc.) in an accredited institution will accumulate 1 point for each semester hour taught.	6	12
Obtaining an advanced ergonomics degree.	A certified ergonomist who obtains an advanced, ergonomics related degree will accumulate 25 points.	NO LIMIT	NO LIMIT
Other service to the ergonomics community.	A certified ergonomist who serves the ergonomics community, beyond the aforementioned categories and which is not a specific requirement of the job, e.g., establishing an ergonomics program in an organization, establishing a university major or minor program in ergonomics, etc.) will accumulate 1 point.	1	5
Retaking the CPE or the CEA examination.	A CPE/CHFP who retakes and passes the CPE examination or a CEA who retakes and passes the CEA examination will accumulate 25 points.	N/A	N/A

SOME THOUGHTS ON THE PAST, PRESENT & FUTURE OF BCPE

by Col. Valerie Rice, Ph.D., CPE
BCPE President

Dieter Jahns is stepping down from his role as Executive Director of the BCPE. I contemplated which achievements to chronicle in a "thank you" publication directed to and about Dieter. However, I quickly realized all that has been accomplished within the BCPE was due, in some fashion, to Dieter's involvement.

In the beginning, there was Dieter.

The Human Factors Society (HFS) membership had debated the issue of individual credentialing for years (even before "ergonomics" was added to the society name). While working together on an Air Force and DoD project to scope the discipline of human factors as applied to military Research and Development, Hal Hendrick and Harry Snyder discussed the issue (Harry was then President Elect of the HFS). Once Harry became President (1979-1980), he appointed a small committee, chaired by Jeff Koonce. A year or so later, Hal was appointed to head a sub-committee on certification. As part of the certification effort, funding was obtained from the military and from HFS to do a focus group using task analysis to try and scope the HF discipline. Two detailed reports on two of five major HF core areas were identified, and it was recognized that Human Factors has a core set of competencies which could be evaluated in a certification process for HF professionals (~1983-1985). Also, the HFS membership had indicated, in an all member survey, that although they did not favor licensing, approximately 80% did favor certification (~1982). In spite of the presentation of the data, the proposal that the HFS proceed with formal development of a certification program was defeated. Dieter took an interest in and participated in these discussions; and when Dieter has an opinion on something, he has no problem voicing that opinion.

The charge on his white horse.

In 1990 Dieter broke from the pack of Human Factors Society discussants. He arranged a meeting in conjunction with the Human Factors Society annual conference in Orlando, during which he proposed the development of a new and separate organization. The debate continued, but individuals who were supportive of the concept banded together while they evaluated the responses received from HFS members, and considered the advice received from other certification organizations. Dieter remained constant, constantly pushing, cajoling, debating, arguing, and most of all persisting in moving ahead. He had recognized it was time for action. All of the talk was fine. The talk was good. The talk was necessary; but it was only fine, good and necessary as part of the action. Dieter put his own career and his work as an independent consultant in the background, as he got down to the new business at hand: establishing a process whereby individuals could apply and become credentialed professionals in the area of ergonomics and human factors.

A brave new world.

The professional field will never be the same. For many in the HFS, Human Factors/Ergonomics was a combination of knowledge from other professions, and practitioners came from many backgrounds to practice in concert with others to solve design problems. Now, there was a change. Here was a group of individuals who had proclaimed, by virtue of the organization they constructed, that Human Factors/Ergonomics is a unique body of knowledge that supports a singular discipline. This may be the greatest legacy of all.

No rest for the weary.

For the next nine years (and especially in the beginning), Dieter served as the navigator for the BCPE. As the board of directors selected their course, Dieter was there with his compass making certain they stayed on track. He organized the support personnel necessary for the mounting administrative duties. He screened and spoke with persons interested in becoming board members, all the while attentive to whether they would actually put forth the active effort necessary to be part of a WORKING board. His entire family lived with, functioned in, and their vacations revolved around BCPE. Karel worked directly for BCPE, his daughter helped out, his daughter's friends became involved, his son obtained his degree in HF/E and, of course...without question, he applied for associate ergonomics professional status.

Many accomplishments have occurred in the nine years since the BCPE's inception. These are Dieter's accomplishments also, and some of them are listed below:

Certification:

- Developed a process for certifying the Professional Ergonomist (CPE) or Human Factors Professional (CHFP). To date, 740 professionals have earned this recognition.
- Developed an "ergonomist in training" process with an "Associate Ergonomics Professional" designation which has been awarded to 67 individuals. This process established a formal relationship with the HFES and their accreditation of university programs.
- Developed a process for certifying the Ergonomics Associate (CEA). To date, ten people have earned this recognition.
- Developed a special category certification for certifying senior professional ergonomists. To date, four people have earned this recognition.

Organization:

- Established a fully functional,

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successful non-profit organization (complete with by-laws, job descriptions, a corporate logo, etc.).

• Became a member of the National Organization of Competency Assurance (NOCA).

• Established a formal agreement with the Center for Registration of European Ergonomists (CREE) to mutually encourage and refer qualified applicants to their regional certifying organization (BCPE or CREE).

• Established formal communication ties with the HFES, HFAC/ACE, AIHA, BCSP, AOTA, and the IEA.

• Assisted other international certification efforts through formal and informal consulting (Africa, Japan, Italian Ergonomics Association).

• Established a newsletter, *The Professional Ergonomist* as well as the BCPE web site.

Other:

• Provided feedback to US Department of Labor, OSHA musculoskeletal draft standard.

• Published Dave Meister's text *The Practice of Ergonomics: Reflections on a Profession.*

In Progress:

• Obtain recognition by the Council of Engineering and Scientific Specialty Boards, part of which requires continued competency evaluation.

• Obtain recognition by IEA.

The next generation.

Dieter Jahns is stepping down from his role as Executive Director of the BCPE. We know that. We also know that through his efforts, a credentialing process was put in place, and an organization with considerable influence on the Human Factors/Ergonomics professional community exists. BCPE is on track. The role for Dieter has changed. No longer does BCPE need the initiator or the navigator. Like a young man or woman leaving home to begin life on his or her own, BCPE has matured. The role for Dieter now (which he has agreed to assume) is as a consultant, someone to share corporate knowledge, to occasionally remind board members of their roots, and to offer guidance, knowing full well they will consider the advice and make their own decisions!

Thank you Dieter, for having the courage to act on your convictions. Thank you for our beginning and being with us as we achieved our organizational goals. Thank you for agreeing to "be there", as a consultant. Your legacy will continue.

REFLECTIONS ON MY CAREER

by Dieter Jahns, M.S., CPE

We have come a long way since I first decided that "human factors engineering" was more exciting and challenging than "electrical engineering." In 1961, Chapanis, et al (1949) and McCormick (1957) formed the primary foundation upon which I built my education in the human factors aspects of technology. Manned space flight was still a futuristic vision as I got to work with Col. John Paul Stapp on deceleration and crash-force research and processed training data of the astrochimps Ham and Enos (Meeter, 1967) during summer internships while pursuing my university degrees. Fred H. Rholes, Jr. was an eager Air Force Lt. Col. at Holloman AFB who built up the Aeromed Lab and then went to Kansas State University to teach others about human factors science and technology in "unusual" environments. The computers we used filled whole rooms, were programmed by "patch wiring" and "punched cards," and were "hybrid" by having both analog and digital processors. We did things that could probably not be done today because the cultural, regulatory and risk perception/acceptance climate has become much more cautious. I cannot imagine anyone being allowed to step out of a balloon gondola at 100,000 foot altitude today as Joe Kittinger did in 1960. We did not have fancy math models and automated decision-support systems, beyond what we observed and carried between our ears. But, preparation and safety were just as important then as now. What I learned, and later practiced at Boeing, was a hodgepodge of physics, mathematics, human psychology, physiology and anatomy applied to new hardware being designed by "real" engineers. My goal was to make things "workable with ease"; theirs was to make things rugged and functional. I respected their work, and they respected mine. Often I was jealous that the laws of physics were so much easier to work with for them than human behavioral theories and principles were for me. Vehicle navigation, guidance, control and communication functions were extended by mechanical and electrical engineering technologies; the human operators could now find things better, move faster and in all kinds of weather in advanced human-machine systems. The sky was no longer the limit, or, at least, the limits for human functioning and survivability were better understood (Ryan, 1995).

I became interested in professional practice standards (both in terms of accreditation of academic programs and the certification of individuals) when it dawned on me that 25 years after I had opted for my career in what is now called ergonomics, youngsters (like my son) still had to deal with a hodgepodge of courses without a clear-cut curriculum structure as exists for other career fields (e.g., engineering, health care, accounting, teaching, and law). The problem had been studied and debated for years; but nothing concrete was done about it until the BCPE was formed (Jahns, 1992). The rest is history, familiar to the readers of this newsletter. Now the time has come to let others contribute to the mission and vision of BCPE from a fresh perspective and with new energy. The foundation has been laid, the handbooks are in place, the prospect of growth is real.

I am still actively pursuing new opportunities in ergonomics and look forward to shaping some aspects of the merging communication and transportation technologies from a human-centered, systems approach. It seems to me, that as transportation and communication/ information technologies are now merging (e.g., aviation "Free Flight", and ITS in automotive domains), the concepts of space and time are becoming surreal. We can now access data (in almost any form imaginable) any time we want to, wherever we may be, stationary or on the move. Yet, individually, we still have trouble balancing sleep, recreation and work. Maybe that's the future challenge to ergonomics: sociotechnical systems which bring balance to life, create cooperative work structures, and facilitate life-long learning. What we have to guard against is what Konrad Lorenz (1983) called the "waning of humaneness" brought on by technocracy, or inappropriate faith in technology.

References:

Chapanis, A., Garner, W. R.; and C. T. Morgan (1949). *Applied Experimental Psychology: Human Factors in Engineering Design.* New York NY: John Wiley and Sons, Inc.

Jahns, D. W. (1992). Credentials, criteria, and certification of ergonomists. *CSERIAC Gateway,* WPAFB OH, Vol III No. 4, pgs 1-5.

Lorenz, K. (1983). *Der Abbau des Menschlichen.* Munich, FRG: R. Piper & Co., Publishers. (Translated by R. W. Kickert, *The Waning of Humaneness,* 1987, Boston, MA: Little, Brown & Co.)

McCormick E. J. (1957). *Human Factors Engineering.* New York NY: McGraw Hill Inc.

Meeter, G. F. (1967). *The Holloman Story.* Albuquerque NM: University of New Mexico Press.

Ryan, C. (1995). *The Pre-Astronauts: Manned Ballooning on the Threshold of Space.* Annapolis MD: Naval Institute Press.

THE PAST AND PROJECTED ROLE OF HUMAN FACTORS ENGINEERING - (HFE) IN THE COMMERCIAL MARITIME INDUSTRY

by G. E. Miller, M.A., CPE

Gerry Miller, in the following piece, describes his work on offshore oil platform design. His justifiable pride is clear, but he ends with a cautionary note. A qualified human factors specialist does good, even pioneering, work in a new domain. A new market is created for our profession. When we cannot or do not sufficiently meet that market, we potentially lose it to former operators, to technical writers or to content area specialists, none of whom are qualified in human factors or ergonomics. The results show. Been here before, haven't we? What's to be done? (Ed. note)

Application of Human Factors Engineering (HFE) to the improvement of the industrial workplace, and the associated reduction of human induced accidents and incidents, is a noble and achievable goal. Some sectors of the industrial world (e.g. meat packing, light manufacturing, aerospace and aviation, and the military) have assigned HFE specialists to achieve a demonstrated improvement in employee production and safety with proven cost savings (Hendrick, 1997). One sector of the commercial industrial world that could benefit from such HFE involvement, but has done so only sparingly to date, is the maritime industry.

Worldwide, the commercial marine industry has two key components: 1) ships, and 2) offshore oil and gas exploration, drilling, and production. Shipping involves the design and operation of commercial ships of all types ranging from such large vessels as VLCC tankers and container ships to such small boats as tugboats and fishing vessels. The offshore oil and gas sector consists of varying types of drilling rigs, production platforms, workover boats, and support vessels.

Whether the commercial maritime employee is working on a ship or on an offshore structure, he/she can be subjected to workplace influences often not shared by their land based counterparts. These include:

1. Long separation from family, friends and traditional support groups;
2. Environmental working conditions unique to the world's oceans;
3. Lack of easy and convenient escape routes from a fire, flooding or other major workplace incident;
4. Limited social interaction with other workers (especially on the minimally manned vessels or offshore platforms);
5. Long and irregular work hours (especially on ships) and frequent interruptions in rest periods. This significantly reduces the quality and quantity of sleep, and brings peak crew performance requirements in direct conflict with the workers' circadian rhythms.
6. Primary dependence on the crew to handle emergencies since assist groups (i.e. fire fighters, medical personnel, oil clean-up specialists, etc.) are often hours away;
7. The use of multi-national crews, with their different languages, customs, traditions, and even physical and mental capabilities, integrated into a single unit, that can be required to interact efficiently in case of emergencies;
8. A lack of cohesiveness and familiarity with fellow employees due to the frequent turnover of crew (especially on ships) as the result of the long standing hiring practices of the industry.

With these unique workplace influences, and the more common HFE issues shared with the land based workers such as poor design, inadequate or inappropriate training, little attention paid to applicant screening for job assignment, and use of outdated hierarchical and punitive management techniques, the marine industry offers a significant potential for HFE to contribute to the management, design and operation of maritime facilities.

Unfortunately, with very few notable exceptions, HFE has yet to penetrate the maritime industry to improve employee efficiency and safety. The remainder of this paper will describe one of those exceptions involving a company in the offshore oil and gas exploration and production business in the Gulf of Mexico (GOM).

Offshore oil and gas production has been underway in the GOM for about forty years. Hundreds of offshore platforms of varying size and complexity have been installed in the GOM. Most of these are "jacketed" platforms, with drilling or processing equipment on structures above the water. Steel legs anchored to the ocean floor support these structures. This is the preferred design concept for offshore platforms for depths under about 1,300 feet. At greater depth, economical and structural reasons demand other solutions. The current trend is to drill and produce oil and gas from depths far in excess of 1,300 feet (there are wells now producing in depths over 5,000 feet in the GOM). Completely new, floating type, drilling rig and production platform designs are required. With the inauguration of their first ever floating drilling and production platform (called a Tendon Leg Platform, or TLP for short), Shell Offshore Inc. (SOI) called upon the HFE profession for assistance.

In the late 1980's SOI initiated the design and construction of an offshore platform to drill for, and recover large reserves of oil and gas in the GOM from a then world's record water depth of almost 3,000 feet. The design chosen was a "Tendon Leg Platform. A TLP floats like a ship, but is anchored to the sea floor by large steel pipes called "tendons" which keep the TLP in place over the wells. In the late 1980's the TLP concept was new and represented a significant increase in technology, and in hazards associated with the design. Because of its size (a football field square and as tall as a fifty-five story building from the keel of the platform hull to the top of the flare tower), the number of personnel required on-board to operate and maintain it (over 120), and its expense (eventual total project costs exceeded one billion dollars), the potential of significant loss in economic assets and human life from a human induced accident on this platform was extremely high. Further, the infamous Piper Alpha offshore platform disaster in the North Sea, which resulted from a series of human errors and ultimately claimed over 160 lives, had occurred shortly before this project started and had demonstrated how catastrophic human error could be on a large and confined offshore structure.

SOI felt that they had the expertise to identify and control the mechanical, structural, and organizational failures that might cause or contribute to a fire, explosion, major pollution event, damage to equipment, or injury to their personnel. But they also knew that human error might cause an accident for which they did not possess the necessary skill to reduce or eliminate.

In early 1990 the head of the Health, Safety, and Environment Department for SOI's Deepwater Division suggested to company management use of HFE as another tool in their overall effort to reduce accidents on-board their new deepwater offshore platform. Consequently, in June of that year, SOI initiated its first ever formal HFE program in the design of an offshore platform.

Since SOI had had no previous working experience with HFE as a profession, or with individual HFE professionals, they opted for the following program approach:

1. They would use a consultant, academically trained in the HFE discipline and experienced in the application of HFE to the design and operation of marine hardware.
2. The HFE program would be practical, pragmatic and applied to specific questions of design, management, and operation of the TLP where there was human involvement.
3. The HFE inputs would be based as much as possible on established HFE research data, and/or existing HFE design standards. This would be done in order to

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gain better acceptance of the HFE inputs by the other engineering and operational disciplines involved. As an example, for design issues the HFE standard published by ASTM (i.e., *Standard Practice for Human Engineering Design for Marine Systems, Equipment and Facilities*) would serve as the principal HFE design guidance document.

4. The HFE effort would concentrate on design and operational issues known to have caused human errors on existing platforms, or which were anticipated to cause human errors on the new structure because of the types of operator tasks required.

5. The HFE program would seek the broadest possible application of all components of HFE (e.g., equipment and workplace design, personnel selection, training, management organization, manuals and procedures, control of the working environment) to reduce the potential for occurrence of human error on the platform.

6. The HFE program would be based on the following hierarchy of approach for reducing human errors:

A. Design out the chance for human error

B. Guard against the consequences of human error

C. Warn the operator about the chance for human error

D. Train personnel to reduce the likelihood of human error

E. Write procedures to reduce human error

At the time HFE was first brought on board at SOI the design for the first platform, called *Auger* (offshore structures are given names just like ships are named), had already been underway for almost two years. It was quickly evident that much of what could have, or should have, been done to include HFE in that structure's design was not possible for economic or schedule restrictions. That was a lesson well learned and corrected by SOI. On future projects HFE was added to the design team as soon as it was formed, i.e., HFE was included from the very beginning.

Another lesson learned from *Auger* was that HFE could contribute to improved operations and safety on the new platforms in ways other than just through better hardware or workplace design. As an example, during the *Auger* period, the HFE specialist was used in creating training programs, writing or reviewing operations manuals and procedures, establishing management policies and practices on work schedules and job safety programs, setting environmental standards for work places, and representing the human element in hazardous operations analyses.

In 1993 SOI initiated its second major deepwater platform (called *Mars*) design program and HFE was included in the design team from the very beginning. Because of the lessons learned from *Auger,* SOI appointed a person dedicated to serve full time as the Risk Manager for the new platform. That person had overall responsibility for safety in all aspects of the *Mars* design. In contrast to *Auger,* where HFE was in a support group outside of the engineering design department, the HFE function on *Mars* was assigned to the Risk Manager who was a key member of the design activity. This turned out to be an excellent choice for it gave HFE access to all of the design decisions covering not only the platform, but also ancillary areas such as supply boat operations and drilling. It also placed HFE as an integral part of the total design and operations team, which significantly enhanced its acceptability by the other engineering disciplines and operations personnel.

As a result of these organizational changes and a broader acceptance of HFE as a result of several major "successes" on *Auger,* the HFE involvement in *Mars* was considerably expanded. HFE products on the new platform included design standards and checklists, drawing reviews, safety hazard analyses and audits, training programs, vendor reviews, software and interface design reviews, work schedules and procedures, labels and warnings, and special tool designs.

Two specific HFE successes demonstrate how HFE worked in the *Mars* program:

1. Considering SOI's own accident data, as well as that of the industry in general, it was evident that falls were the leading cause of personal injuries and fatalities on offshore platforms. In SOI's case stairs were major sources of those falls. So HFE set out to see if that problem could be reduced. The result was a new stair and ladder design standard based on HFE research data that identified the optimum design standard for this mundane but important piece of hardware. Not only was the new standard imposed on all stairs on *Mars,* but it is now also used on all of SOI's deepwater platforms.

2. SOI purchased major vendor supplied hardware to install on the platform. Previously there had been no HFE input to the design of this equipment. For *Mars,* SOI sent its HFE specialist to visit several vendors, such as the suppliers of lifeboats and gas turbines. HFE conducted audits of those items, and where appropriate, suggested design changes to make these items more compliant with accepted HFE design standards. Cooperation from the vendors allowed SOI to acquire hardware that, for the first time, incorporated HFE principles. As an example of the benefit of this effort, HFE suggested design changes in the way the gas turbine enclosures were constructed. Accepted and incorporated by the vendor, these changes now allow SOI maintenance personnel to remove a turbine from the field gas compressor enclosure much more safely and in about one-third the previous time.

It has been nine years and five new deepwater platforms since SOI first introduced HFE. As an indication of their belief in its value consider the following:

1. In early 1998 when the first and only HFE specialist SOI had ever used decided to retire they requested that he assist them in finding a replacement to carry on the HFE activities.

2. HFE design standards (written initially for the *Mars* program) are now being incorporated into a company wide set of design requirements for all future new deepwater offshore facility designs.

3. HFE training has been given to all of the SOI deepwater personnel and is also required for new design contractor employees who work on a SOI project for the first time.

It would be nice to report that from SOI's experience the rest of the offshore oil and gas industry has dramatically increased its use of HFE to enhance employee productivity and safety. In fact there are a few companies that now use HFE but the overall industry's application of HFE is still weak. However, as an indication that times are changing consider this:

1. In December 1996 the first International Conference on the Role of Human Factors in the Offshore Industry was held in New Orleans with representatives from most of the countries with offshore industries attending. Further, the second conference is tentatively scheduled for the summer of the year 2000.

2. Four HFE professionals were retained to assist in the design and construction of three offshore gas well platforms and an onshore gas treatment plant in a two billion Canadian dollar project now under construction in Nova Scotia, Canada.

3. Exxon Oil Company and Halliburton now have full-time HFE specialists in their Houston Headquarters.

4. There will be, for the first time ever, a full technical session dedicated to the discussion of the current and projected role of HFE in the offshore industry at the Offshore Technology Conference in Houston, Texas in May of 1999. This will be the largest offshore trade show in the world.

5. Paragon Engineering of Houston, one of the leading designers of offshore facilities in the U.S, now has three full-time HFE specialists on their staff.

6. Diamond Offshore Drilling, one of the largest offshore drilling companies in the U.S. is currently using an HFE

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THE PAST AND PROJECTED ROLE

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consultant to assist in the design of an ultra deepwater (7,500 foot) drilling rig being constructed in Sabine Pass, Texas.

7. Federal regulatory agencies involved in the U.S. and overseas offshore industries are now placing a great deal more attention on HFE as a way to reduce human-induced accidents on offshore structures.

The same general lack of use of HFE currently exists in commercial shipping, the other arm of the maritime industry. However, there has been some change in that area as well. It is highlighted by the release in early 1998 of the HFE design standard entitled, "Guidance Notes on the Application of Ergonomics to Marine Systems" published by the highly respected American Bureau of Shipping (ABS). The International Maritime Organization (IMO), which regulates commercial shipping around the world, is now requiring that HFE be considered in every new regulation it writes. In addition, the U.S. Coast Guard is now placing a significant emphasis on the role of human error as the cause of, or contributor to, the vast majority of maritime accidents. As a result, it is now providing a weeklong HFE class to its marine inspectors on how to recognize HFE deficiencies on ships during routine inspections. It is also offering a daylong HFE session in its introductory class for maritime accident investigators on identification of HFE based causes of marine accidents.

Even if the maritime industry turns more to HFE professionals for assistance, we would be hard pressed to provide academically trained and professionally certified HFE specialists familiar with the marine environment. There will be a need in the coming years for certified individuals experienced and trained in a variety of HFE disciplines such as training, personnel selection, equipment design, organizational psychology, work scheduling and fatigue countermeasures, and human resource management to work in the marine industry. There are those who, by virtue of being a former Coast Guard officer or enlisted person, a retired ship captain or deck officer, or a harbor pilot now claim to be the HFE specialist, but even these are extremely few in number. Marine oriented HFE specialists do not currently exist, with or without certification.

References:

ASTM (1995) *Standard Practice for Human Engineering Design for Marine Systems, Equipment and Facilities.* Publication F1166-95A.

Hendrick, Hal (1997) *Good ergonomics is good economics,* Human Factors & Ergonomics Society, Santa Monica, CA.

THE NEW EDITOR AND STAFF AT BCPE HQ

With all the recent changes, it may be instructive to introduce the folks who edit this newsletter and staff the Bellingham, Washington office.

Thomas C. Way, M.A., CPE

The Professional Ergonomist Editor

Tom is now serving as a volunteer, chief editor and will have help from Steve Casey and Dieter Jahns to publish *The Professional Ergonomist* on a regular basis. Articles and items of interest are always welcome. We would like to publish things that can enhance understanding of what we do, how we do it, and/or are concerned about within our profession.

Tom has degrees in psychology from the University of Rochester and the University of California at Santa Barbara. He retired from The Boeing Company in May 1998 after an almost-thirty year career in R&D, airplane design, human-computer-interface, and most recently, industrial ergonomics. Since then, he has been occupied with deferred house maintenance, travel, a modest HF forensic practice and volunteer work, mostly on church, social and political projects. In the early and mid '80s he had a period of hyperactivity in HFS, serving as Chapter President, Annual Meeting Chair, member of the Executive Council and chair of the Chapter Affairs Committee. Since then, his professional organization activity level has abated but not disappeared. Tom welcomes this opportunity to serve.

Kris Alvord, B.S.

Executive Administrator

Kris was hired as a temporary employee in late 1993 to help process the large number of applications submitted to meet the deadline for Phase I certification. After spending most of 1994 prepping each application for the evaluation process, she was offered a permanent, part-time position as BCPE's administrative assistant. Having returned to school to pursue a Bachelor's degree, Kris was happy to accept the position as long as her work schedule remained flexible, to accommodate her ever changing class schedule. For the next three years, Kris' duties included corresponding with individuals inquiring about BCPE certification, serving as the coordinator of the written examination and preparing the *Directory of Certificants.* In January 1999, after graduating from Western Washington University with a Bachelor of Science degree, Kris was promoted to her current position of Executive Administrator.

Born and raised in an outlying area of Bellingham, Kris enjoys spending time outdoors, being physically active, reading, and taking classes at the local technical and community colleges.

Karel Jahns, B.S., CMA-C

Financial/Information Systems Manager

As a volunteer and/or part-time worker since BCPE's inception prior to 1990, Karel has worked on whatever needed to be done on the secretarial and financial side of operations. She had been part-time secretary/bookkeeper to husband Dieter's SynerTech Associates consulting firm and in the early days (when BCPE shared offices with SynerTech) she provided office support for both operations.

Karel's educational background consists of a Bachelor of Science (biology major, German minor) from the University of New Mexico in Albuquerque. After marriage to Dieter Jahns right after graduation, she worked at the Bernalillo Indian Hospital as a Bacteriology technician while Dieter was in graduate school. In 1966, Seattle Washington became home and birthplace for two lovely children. After the children were older, Karel went back to school part-time to study Medical Assisting, a two-year program at Highline Community College. The program trains participants in both administrative and clinical work in a doctor's office. Immediately after obtaining her Associate in Applied Science degree in that field, she sat for the American Association of Medical Assistants (AAMA) certification exam. She was awarded the Certified Medical Assistant-Clinical, or CMA-C, upon passing those exams and has worked part-time in a dermatologist's office ever since. Over the years she has been a member of the AAMA and a participant and leader in both the local Whatcom County Chapter Medical Assistants and state organization, Washington State Society of Medical Assistants. She served as President of the WSSMA in 1995, and has served as President of the local chapter for three years. Karel has served on the Advisory Board of the Whatcom Community College Medical Assisting Program for the last twelve years. Her hobbies include reading, gardening and genealogy.

CYBERG 1999

15th September - 15th October 1999
CybErg 1999, the Second International Cyberspace Conference on Ergonomics. Abstracts are due April 9, 1999. Details may be found at the website: http://cyberg.curtin.edu.au/

THE PROFESSIONAL ERGONOMIST

The Newsletter of the BCPE

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Editor-in-Chief: Thomas C. Way, MA, CPE
Associate Editors: Steven Casey, PhD, CPE
Dieter W. Jahns, MS, CPE
Executive Administrator: Kris Alvord
Financial/Information Systems Manager: Karel Jahns
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Anna M. Wichansky, PhD, CPE

Board of Certification in
Professional Ergonomics
P.O. Box 2811
Bellingham, WA 98227-2811
USA

BCPE 1999 CALENDAR OF EVENTS

April 12, 1999	BCPE Exam - Various sites throughout the US and Canada. Deadline past.
April 23-25, 1999	BCPE MidYear Business Meeting - Denver CO
June 1, 1999	BCPE Exam in San Jose, CA at ErgoCon '99 Postmark deadline for application: April 1, 1999
June 6, 1999	BCPE Exam in Toronto, ON, Canada at the 1999 American Industrial Hygiene Annual Conference & Exposition Postmark deadline for application: April 6, 1999
September 26, 1999	BCPE Exam in Houston TX prior to the Human Factors and Ergonomics Society 43rd Annual Meeting Postmark deadline for application: July 26, 1999
October 1-2, 1999	BCPE Annual Meeting in Houston TX

CORRECTION

An error was made in the last newsletter regarding Steve MacNeil's degree. It should have read Steven K. MacNeil MSc AEP. We apologize for the error.

DOCUMENT ORDER FORM

There are several items BCPE sends out free or for a miniumum charge. As an insert to this newsletter, we have included our Document Order Form which lists these items. The most popular items are, of course, our free information fact sheets. Sales on Dave Meister's book, *The Practice of Ergonomics,* have gone well. There are still some left from the first printing. Lapel pins are available at $10.00 each for the Certified Professional Ergonomist and Certified Human Factors Professional. *Information on Certification Policies, Practices and Procedures* has been revised and will be off the press as this newsletter reaches you. It has been retitled *Candidate Handbook: Certification Policies, Practices and Procedures.* This booklet will go out with every application kit request and is available separately (for certificants at $5.00, non-certificants at $8.00). If you are interested in any of the items on our order form, please contact us with your order.