INTERNATIONAL BOARD OF FORENSIC ENGINEERING SCIENCES

FUNCTION AND PURPOSE

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INTERNATIONAL BOARD OF FORENSIC ENGINEERING SCIENCES

FUNCTION AND PURPOSE

1. MISSION STATEMENT

The International Board of Forensic Engineering Sciences was established to provide a means by which qualified and ethical forensic engineering scientists are identified, endorsed (certified) by their peers as “Diplomates”, and thereby recommended to the public internationally, and to the legal community in particular.

The International Board of Forensic Engineering Sciences promotes the necessity of good ethics and through its Code of Ethics and Rules of Professional Conduct promotes among its Diplomates (appendix A). Provision is made for sanctions in the event of proven violations.

2. HISTORY

It became clear in the 1970’s and 1980’s that a number of persons in engineering sciences across the US and elsewhere, were serving the courts as “experts” when they were technologically incompetent and/or dishonest. With the endorsement of the Engineering Sciences Section of the American Academy of Forensic Sciences a group of US and Canadian practitioners in this field, set about to establish a completely independent organization, not beholden nor dependent on any other organization, to seek out and certify forensic engineering scientists who have been tested by their peers, and are believed to be ethical and competent in the specialty of “Forensic Engineering Sciences”. The International Board of Forensic Engineering Sciences was incorporated in the State of Florida as a non-profit corporation.

3. IBFES GOAL

Maintain a directory of certified experts in the Engineering Sciences who are technically competent, forensically experienced, and having unquestioned ethics.

The IBFES promotes among its Diplomates the absolute necessity of good ethical practice and behavior through its Code of Ethics and Rules of Professional Conduct.

The IBFES is structured to give confidence to interested parties in its competence, impartiality, and integrity.

4. DEFINITION OF ENGINEERING SCIENCES

The term “engineering sciences” is intended to indicate technologies using the basic principles of physics, chemistry, and mathematics as used in a multitude of applications. This field is very broad as there are numerous areas of expertise within the broad categories of electrical, mechanical and civil engineering. The IBFES recognizes only one specialty, namely forensic engineering science, which is that aspect of engineering science specifically devoted to applying engineering science skills to

determine what went physically wrong in any given case, what caused it to go wrong, how much damage was done, what is required to repair the damage, was the actions of any particular person or organization a contributing factor to causing the damage, and questions of that sort. Primarily forensic engineering scientists are called on to assist in the settlement of civil disputes, and to give technical evidence to the courts. Therefore forensic engineering scientists must be skilled in the art of explaining complex technical situations to lay people in understandable common language.

5. DIVERSITY OF FORENSIC ENGINEERING SCIENCES

The field of Engineering Sciences is very broadly diverse in the specialties offered by individuals. Popular conceptions of "engineering" are in the broad fields of electrical, mechanical, civil, chemical, and petroleum. These are but very basic technologies and a measure of the wide diversity in engineering is shown in the index. Other fields closely related and part of "engineering sciences" are those such as metallurgy, physics, physical chemistry, chemistry, photogrammetry, meteorology, geology, and nuclear, along with numerous others in the general class of physical sciences.

The AAFS Engineering Science Section membership has more diverse specialties than does NAFE because the membership is open to metallurgists, chemists, physicists, optical specialists, photogrammetrists, and others involved with the application of physics, chemistry, and mathematics in their practice.

Electrical Engineering, Physics, and Chemistry provided the earliest work using digital information processing and digital computers, and have continued to provide the hardware developments. As a result the digital field is actually an important part of "engineering sciences."

This wide diversity also means that in a great many of these specialties there is only a small number of individuals, and an even smaller number participating in forensics

As that specialty is very broad, encompassing hundreds of particular areas of expertise, each person being certified must identify their own areas of expertise within the broad specialty of forensic engineering science.

6. ORGANIZATION

The IBFES is organized and structured to accomplish the mission as stated above. In every identifiable way the process is designed to maintain proper security, correct technology, consistent legal aspects, appropriate qualifications and continuing evaluation. The IBFES is a non-profit corporation registered in the State of Florida.

IBFES ORGANIZATION CHART

MEMBERSHIP - (INCLUDES ALL DIPLOMATES)

↓

BOARD OF TRUSTEES

↓

PRESIDENT

PAST PRESIDENT	**VICE PRESIDENT - MEMBERSHIP**	**VICE PRESIDENT - POLICY**	**SECRETARY-TREASURER**
Committees: - Ethics and Discipline - FSAB Rep.	Committees: - Membership Applications - Examinations (=Written, =Oral) - Membership records	Committees: - Policy - Procedures - FSAB Application	Committees: - Liaison with State of Florida - Finance

7. REQUIREMENTS FOR CERTIFICATION

A. GENERAL

1. An IBFES certificate indicates an individual who has been determined to be technically competent, forensically experienced, dedicated to ethical work and professionally correct.
2. The IBFES has no special conditions of age, race, gender, national origin, handicap, life style, or marital status.
3. Detail requirements for certification are continually evaluated and may be revised at any time by the Board.
4. Certification is offered only to individuals.

B. ACADEMIC

Verifiable evidence of a bachelor, master, or earned doctorate degree in one of the engineering sciences from a recognized, accredited institution of higher learning is required.

C. EXPERIENCE

The applicant must submit evidence of personal forensic experience in the litigation process including depositions and trial testimony for the 3 years prior to the date of application. This is a listing of cases Including depositions and trial testimony specifying case name, jurisdiction, dates and attorney for whom worked.

Experience Requirements:

- A full-time practical physical science or engineering employment in a physical science or engineering discipline for not less than:
  - 8 years for Bachelor degree holders
  - 6 years for Masters degree holders
  - 6 years for Doctorate degree holders
  - 6 years for those holding registration as Professional Engineers

Those non-U.S. registered or licensed engineers who submit evidence of having met the requirements equivalent to those of U.S. registrants will be accepted under this point.

Those applicants already certified by an examining board which is accredited by the Forensic Specialties Accreditation Board will be accepted as having the necessary education and experience.

Applicability of experience will be evaluated by the BOARD

D. REFERENCES

A candidate is required to submit a prepared form to three references for whom work has been done. These references return their forms direct to the IBFES secretary. These forms are scrutinized carefully for any clues to negative aspects. If any are suspected the references are contacted directly for further information.

E. ETHICS AND PROFESSIONAL STANDARDS

The IBFES believes the ethical practice of the FES person is of supreme importance.

The application form includes a statement obligating the applicant to accept and agree to be bound by the IBFES Code of Ethics and Rules of Professional Conduct. (appendix A) The form requires a notarized signature of the applicant. The code/canon is quite specific in its requirements. The IBFES also believes “ethics,” “ethical behavior,” and “ethical professional practice” is absolutely essential in

modern Forensic Engineering Science practice. This was a principal motivation in establishing the IBFES.

8. EXAMINATIONS

Once the application for certification has been received, reviewed by IBFES examiners, and it has been found to be complete and satisfactory, the applicant is required to undertake two examinations as follows:

A. ETHICS

If a person wishes, for whatever reason, to be ethical in performance, an understanding and appreciation of the subject and its application to the Forensic Engineering Science practice is mandatory. The IBFES as a part of its overall evaluation of an applicant presents to the applicant at least two hypothetical situations involving their particular area of claimed expertise, or one in which the principles may apply. These situations are chosen wherein the ethical parameters are several, intertwined, complex and have no immediately obvious solutions. They have multiple implications and hazards, and frequently no exact solution. The applicant is asked to identify the ethical problems/questions, describe the implications/potential hazards and approaches.

The situations are usually ones in which there is no obvious answer, there may be several possible interpretations and solutions. This file is continually reviewed to keep abreast of the field of ethics and the growing field of professional standards as they evolve under legislative and judicial pressure.

Two IBFES Board members then review the written analyses. Should these reviews determine that the applicant has not recognized an ethical hazard/s or failed to present an acceptable solution/s to an ethical problem, the entire file will be presented to two other Board members for another evaluation without comment or indication that a question has risen regarding the examination. If the second reviewers arrive at the same or similar conclusions, the applicant is determined to have failed the examination.

The applicant is informed of the result and is offered an opportunity to study a different set of situations. If applicant accepts this offer he is supplied with another set of problem situations. The written analyses of these situations are then evaluated by three members of the Board. If again the applicant's analysis is not considered satisfactory, this committee of three Board members will make a recommendation to the Board as to the proper course of action. Possible options then are 1. offer another set of situations for analysis; and 2. terminate the application. If the application is then terminated by the Board, the applicant is informed in writing of the decision and the reasons for that decision.

B. ORAL EXAMINATION

The process is:

i. The applicant supplies copies of forensic written reports, submitted to three clients. These reports are studied carefully by two board members. The reports are not theoretical, hypothetical cases but real cases usually, actually filed with a court. (These reports then are in fact "written examinations" the applicant has submitted to a client and to the opposition. Obviously, if there are "problems" with the work they are carefully illuminated in the litigation process. The case may or may not have been adjudicated.)

If a question is raised during these evaluations of the reports/depositions, the applicant is asked to submit a different report/deposition which will answer the questions raised by the reviewers. (This has taken place.)

ii. After these forensic reports are studied and considered to be a good measure of the applicant's technical and forensic capabilities, the applicant is invited to sit for an oral examination on another report submitted to a client. Well before the scheduled examination date copies of the report are supplied the oral examination committee of three examiners selected for this particular applicant.

iii. The three examiners are selected for each individual applicant's examination by the Membership Committee Chairman in consultation with the President and other Board members. Generally they are selected from IBFES members, usually Board members, and are individuals known to be responsible, trustworthy, and impartial. It is possible that an outsider might be called in to participate in an examination in which the candidate's field is not well represented in the IBFES membership.

iv. The oral examination is conducted in a closed, private environment in a very formal manner consistent with what might be encountered in deposition or at trial. Disabled persons will be accommodated within reason.

v. Generally, the examination starts with the applicant verbally presenting the case in the report. The presentation must be as complete as possible including all the technical aspects. Then the examiners begin to question the presenter on all aspects of the case.

The first named examiner experienced in the applicant's field (or very close to it) focuses on the technical details (basic fundamentals of physics and chemistry and any other basic science involved) of the case the applicant has presented. This is the point at which the applicant demonstrates technical competence.

The other engineering sciences examiner (may be from another field) then focuses on the applicant's methodology, protocol, interpretation of mathematical results, etc. This examiner focuses on the manner in which applicant has met/or not aspects of the "Daubert/Joiner/Kumho" requirements, and other technical aspects peculiar to the litigation process.

The third examiner is an attorney or a judge selected for experience in technical litigation. This person then acts as moderator and directs the examination. This examiner may redirect the focus as deemed appropriate. Finally, this examiner will conduct a vigorous cross-examination of the applicant's case.

The examination extends until the examiners are satisfied that their mission has been completed.

vi. All three examiners are asked to grade the applicant's ability to communicate technical matters in a manner which the non-technical person can understand and identify with.

Each examiner is asked to complete an evaluation form recording a grade and comments. This form also includes a recommendation from the examiner for pass or fail.

The three forms are submitted to the Membership Committee for final evaluation and a recommendation to the Board to pass or fail.

vii. If it is determined by the examiners the applicant has not met the IBFES requirements, the examiners are asked to make recommendations regarding the content of the notification to the applicant, and possible re-examination.

If an applicant is failed at the oral examination he/she is notified immediately and is informed of the basis for the decision of failure and available options.

Possible options include:

1. Terminate the application;
2. Initiate a completely new application; or

3. Petition the Board for another oral examination. Challenging the examination results is not an option

Another oral examination will be scheduled not earlier than a year later and may have special requirements imposed depending upon the Board's evaluation of the situation.

viii. Should the Board, after a thorough review of the documents submitted, have doubts about the technical competence of an applicant, the applicant's understanding of ethics, the applicant would normally be determined to have failed. The application would then be terminated and the applicant so informed of the Board's decision.

In any case the Board makes the final disposition of the application.

An examinations study guide can be found in Appendix B

9. CERTIFICATION

A. Certification is for a period of five (5) years, and is renewable according to the standards and conditions established by the BOARD. The period of certification will begin on the date of approval by the BOARD.

B. A person holding a valid certificate issued by the BOARD is entitled to use the designation: "DIPLOMATE OF THE INTERNATIONAL BOARD OF FORENSIC ENGINEERING SCIENCES." The initials "D-IBFES" OR THE DESIGNATION "Diplomate IBFES" may be used whenever professionally appropriate. The BOARD OF TRUSTEES may authorize the use in foreign localities, of designations that have similar meaning to the term Diplomate is the United States.

C. A certificate issued by the BOARD is not transferable. It remains the property of the BOARD. However, every person to whom a certificate has been properly issued is entitled to its continued possession unless and until such certificate is revoked.

D. A certificate may be suspended or revoked for cause.

10. RECERTIFICATION EVERY FIVE YEARS

The IBFES requires each member to be recertified each 5 years.

Today technology is evolving at an accelerating rate, faster than at any time in history. It therefore is necessary for the Forensic Engineering Science practitioner to remain abreast of the developments in his/her field of forensic expertise.

The IBFES requires certain minima of forensic experience, continuing education and development. The Diplomate is required to provide records of that experience, education and development activities.

Attendance and participation in technical society meetings at which technical research papers are given contributes heavily to the person's technical "reservoir." Every forensic case adds to a forensic engineering science person's technical "reservoir." Of course, a person's reading of the technical and legal literature can provide very valuable assistance in keeping "up with the times."

1. COMPLAINTS AND DISCIPLINARY PROCEDURES

Any complaint received by the IBFES regarding a Diplomate will be referred to the Ethics Committee chairman. The target Diplomate will be offered opportunity to respond to the complaint. It will be evaluated by the committee who will take any appropriate action. Where warranted a disciplinary hearing will be convened, and appropriate action will be taken.

Any complaint relating to the technical competence of a Diplomate in a very specific area of expertise will be referred to the Ethics Committee. It will be reviewed in conjunction with the individual's personal records. The Ethics committee will decide whether or not the case falls within the stated area of expertise of the individual as evidenced by the confidential records of IBFES. Where warranted the Ethics Committee will recommend to the Board appropriate disciplinary action.

12. RECORDS MAINTAINED BY IBFES

Official records are maintained in a secure fashion for a minimum of five years. Records of any individual are not released without written approval of the individual except when required by law.

13. INQUIRIES

Information concerning the IBFES is available on the IBFES website, or by contacting individuals listed on the website: WWW.IBFES.ORG

INTERNATIONAL BOARD OF FORENSIC ENGINEERING SCIENCES

APPENDIX A

Code of Ethics

Forensic engineering sciences involve both professional engineers and other scientists who work in engineering related disciplines on forensic matters. Professional engineers are already bound by the codes of ethics of the jurisdiction in which they practice. These codes are generally very similar to the code of ethics of the National Society of Professional Engineers, which shall be the reference document of record unless in a specific instance a comparable document governing the ethics of licenses engineers in a particular person's operating region is tabled for that case. Persons certified by this board who are not P.E.'s, or equivalent, are required to abide by the same code of ethics as those who are designated P.E., P.Eng., or equivalent.

Accordingly, persons certified by the IBFES shall be governed by these fundamental canons:

1. Hold paramount the safety, health, and welfare of the public in the performance of their professional duties.
2. Perform services only in areas of their competence.
3. Issue public statements only in an objective and truthful manner.
4. Act in professional matters for each employer or client as faithful agents or trustees.
5. Avoid deceptive acts in the solicitation of professional employment.

Rules of Professional Conduct

With regard to the forensic nature of the activities of persons certified by the IBFES, the following are principles of ethics to which all applicants must accept and agrees to abide by these Rules of Professional Conduct.

1. Be aware of ones own professional and technical qualifications in dealing with each case, and address only those factors that are within ones own expertise and competence. Seek the assistance of other qualified experts whenever necessary.
2. Treat ones own personal integrity with great respect, and never do or say anything that might compromise that personal integrity. This entails not only saying the truth at all times, but also giving due weight to all pertinent observations and facts.
3. Treat all information from a client, agency, or any other exclusive source with the confidentiality required.
4. Treat every object or specimen of potential evidential value with the care and control necessary to preserve its integrity.
5. Utilize the appropriate standards and controls in conducting examinations and analysis.
6. Render opinions and conclusions strictly in accordance with the evidence in the case and only to the extent justified by that evidence.
7. Maintain an attitude of independence and impartiality in order to ensure an unbiased analysis and presentation of the evidence.
8. Carry out the duties of this profession in such a manner as to inspire the confidence of the public.
9. Respect ones peers in this profession and regard them with the same standards that one holds for oneself.
10. Report to the IBFES board any violation of these rules by any other person who is accredited by the board.

11. Refuse to accept, on a contingency fee basis, any assignment involving opinions, conclusions, or expert testimony intended for use in arbitration and/or litigation.

INTERNATIONAL BOARD OF FORENSIC ENGINEERING SCIENCES

APPENDIX B

Examination Study Guide

The IBFES examinations are in two parts: Ethics and Oral.

I. Ethics Examination

For the ethics examination it is recommended that the applicant study carefully the IBFES Code of Ethics and the IBFES Rules of Professional Conduct.

The ethics examination will consist of two parts, each a situation wherein the applicant might find ethical hazards, problems, questions. The applicant is asked to analyze the situation, and in written form define the ethical problems, offer possible solutions and ways in which they might be avoided in the future.

These situations are intended to be representative of actual cases which the applicant might encounter. Therefore, the applicant is at liberty to use whatever resources available at the time to assist in analysis.

The purpose is to determine that the applicant can recognize ethical hazards and has an idea of how to deal with them. It is believed that in order to have an ethical practice the person must understand ethics.

It is strongly recommended the applicant do a detailed analysis of own practice as applying each of the items in the IBFES Code of Ethics and the Rules of Professional Practice. For each item list the points wherein your practice may be at risk and what you would do to prevent a complaint and deal with a complaint. Also list what you can do to reduce and/or minimize the potential hazard.

It is recommended a web search of the subject of ethics, and specifically forensic ethics to update impressions and beliefs about ethical practice.

Additional references on ethics include:

1. Rawls, J. (1999) "A theory of Justice, rev. ed." Belknap Press of Harvard University Press, Cambridge, MA
2. Martin, MW, Schinzinger R. (1989) "Ethics in Engineering, second Edition" McGraw Hill Publishing Company, New York, New York
3. Schinzinger R, Martin MW. (2000) "Introduction to engineering ethics" McGraw Hill Publishing Company, Boston, MA

II. Oral Examination

The oral examination is actually a “cross-examination” of the written report submitted by the applicant. The examiners are two experienced forensic engineering science persons and an attorney, usually a judge, experienced in such matters.

It is recommended the applicant study several subjects: the rules of evidence, the Daubert/Joiner/Kumho criteria, the scientific method, duces tecum subpoenas, and the continuity of possession.

The applicant is advised to prepare for the oral examination in the same manner as in preparation for a deposition or trial testimony. Specifically, review the report and any supporting information in

detail immediately before the examination. This should include any special legal protocols, etc. essentially unique to your specific technical field of expertise.

The examiners will seek to determine the depth of the applicant's technical knowledge, skills in communication and technical application. Also, the applicant's understanding of basic points of evidence and testimony, Daubert questions, and other points in the litigation process.

Question: Were you subjected to a Daubert hearing on the matter the subject of this examination? If so, what was your defense?

Question: If you did not have a Daubert hearing, what would have been your defense if one had been required?