

Engineer's Approval of Testing Design

Case No. 09-3

Facts:

SafeComp is a company that, among other things, designs and makes sensing devices for automobile air bags. Engineer A, a recently licensed professional engineer, was hired to work in the quality control department. About six weeks after starting work, Engineer A was asked to sign off on the design of testing procedures, protocols, and standards in which Engineer A was directly involved, but about which he remained uncertain, due both to his lack of experience in this technical area and also because of his inability to fully interpret the preliminary testing results. Engineer A consulted with other technical professionals involved in the preliminary test design process and could not determine to his satisfaction whether the proposed design was adequate.

Engineer A told his manager that he would not feel comfortable signing off on the test design; and, since he was relatively inexperienced with SafeComp's procedures, protocols, and standards, asked that he not be required to sign off as requested. Supervisor B, Engineer A's supervisor and not an engineer, kept applying pressure on Engineer A to sign off on the design. Eventually, Engineer A decided that he wished neither to violate his principles by doing something that he thought was wrong, nor become involved in a battle in which his career could certainly be major casualty.

Question:

What are Engineer A's ethical obligations under the circumstances?

References:

- Section II.1.a. - NSPE Code of Ethics: *If engineers' judgment is overruled under circumstances that endanger life or property, they shall notify their employer or client and such other authority as may be appropriate.*
- Section II.1.b. - NSPE Code of Ethics: *Engineers shall approve only those engineering documents that are in conformity with applicable standards.*
- Section II.2. - NSPE Code of Ethics: *Engineers shall perform services only in the areas of their competence.*
- Section II.2.b. - NSPE Code of Ethics: *Engineers shall not affix their signatures to any plans or documents dealing with subject matter in which they lack competence, nor to any plan or document not prepared under their direction and control.*
- Section II.2.c. - NSPE Code of Ethics: *Engineers may accept assignments and assume responsibility for coordination of an entire project and sign and seal the engineering documents for the entire project, provided that each technical segment is signed and sealed only by the qualified engineers who prepared the segment.*

Discussion:

A basic foundation of any professional endeavor is the possession of the technical competency to perform the services required by the employer or client in order to serve the interests of that employer or client, consistent with the public health, safety, and welfare.

Earlier NSPE Board of Ethical Review panels have had numerous occasions to consider and discuss the essential elements of this fundamental ethical principle. For example, in BER Case 85-3, a local county ordinance required that the position of county surveyor be filled by a P.E. The first appointee to the position was not a P.E. and was therefore deemed unqualified to continue in the position. The county commissioners met and decided to appoint an engineer, a P.E. with experience and educational background solely in the field of chemical engineering. The engineer accepted the position. The duties and responsibilities of the position of county surveyor included oversight of surveying reports and highway improvement projects, but did not include actual preparation of engineering or surveying documents. After considering earlier cases. The Board noted that while the facts of the earlier cases were dissimilar to the facts in BER Case 85-3, they related to the same NSPE Code provision and therefore had some bearing upon the Board's interpretation of those provisions.

As the Board noted in BER Case 85-3, obviously, there are important distinctions in applying the Code language to a consulting practice and applying the language in the context of an employment relationship. In the former situation, the firm has a good deal more discretion and flexibility and may be able to structure its workforce to fit the needs and requirements of a particular job for which the firm is being retained. For example, if an engineering firm is retained to perform engineering and land surveying services, and the firm does not have expertise in the area of land surveying, under the provisions of the Code the firm should retain individuals with that expertise.

Because of the relatively dynamic nature of private consulting practice, engineering firms frequently establish joint ventures and subcontracts, hire additional qualified personnel, or make other arrangements in order to serve the needs of a client more effectively and efficiently. However, the Board noted that from a practicality standpoint, it would be extremely difficult, if not impossible, for a county surveyor with no background or expertise in surveying to perform effective oversight of surveying reports and highway improvement projects for the county. The Board could not see any way in which the engineer could be in accordance with Code Section II.2.b. under these facts, because whatever course of action he took would result in unethical conduct and compromise his role as county surveyor.

Said the Board, "It may seem plausible that Code Section II.2.c. would provide some ethical avenue through which the engineer could perform the job as county surveyor. While it is true that the engineer meets the legal requirements for the position because he is a licensed professional engineer, professional ethics requires an engineer to go beyond what is specifically permitted by the law. The Board then reviewed Code Section II.2., the introductory section which makes the clear statement that the engineer is obligated to perform services only in his area of competence, and concluded that it would not be consistent with the NSPE Code provision for the engineer to act as a county surveyor when his expertise is limited to the field of chemical engineering.

Later, in Board of Ethical Review Case 94-8, the Board considered a factual situation involving a professional engineer working with a construction contractor on a design/build project for the construction of an industrial facility. During the construction of the project, the construction contractor separately retained the services of a second professional engineer to design structural footings as part of the facility. The second engineer's degree and background was in chemical engineering. The original engineer had been unable to establish that the second engineer had any apparent subsequent training in foundation design, and he had reservations concerning the competence of this engineer to design the structural footings. He reported his concerns to the contractor.

In deciding that it would be unethical for the second engineer to perform the design of the structural footings as part of the facility, and that the original engineer had an ethical responsibility to question Engineer B's competency and report this concern to the contractor, the Board indicated that there was at least a reasonable basis for this conclusion. The Board indicated that while it may be possible for the second engineer to retain the services of a competent structural engineer to design the structural footings for the facility, the Board noted that it did not think this would be feasible under the facts. It appeared under the facts that the second engineer was retained specifically for the sole and exclusive purpose of designing the structural footings in question. If he was to seek a separate firm to perform that very task, the Board noted that it would have to seriously wonder what it was that he was actually hired to perform and for what he was being paid. The Board concluded that the first engineer had an objective basis to determine whether the new engineer had sufficient education, experience, and training to perform the required structural design services.

In light of this, the Board concluded that the first engineer had an ethical obligation to confront the second engineer to make his concerns known, and recommend that he withdraw from the project. If the second engineer refused to acquiesce to the recommendation, said the Board, the primary engineer had an obligation under the Code to bring the matter to the attention of the client and the appropriate authorities and, if necessary, withdraw from the project if his concerns are not met.

In contrast, in BER Case 85-3, the county surveyor's responsibilities did not include actual preparation or approval of engineering or surveying documents; however, the job responsibilities did include oversight of surveying reports and highway improvements. Nevertheless, the Board concluded in BER Case 85-3 that at a bare minimum, one who is serving in the role as a county surveyor must have at least some substantive degree of background and experience in order to accept such a position. Said the Board, "We fail to see how an individual, without such background or experience, could properly perform and exercise the judgment and discretion required by the job."

While the facts of the two previously discussed cases are somewhat different than the present case, both cases are useful in their contrast to the discussion at hand. Both cases involve professional engineers who have made a decision to assume technical responsibility under circumstances that call into question their technical competency to perform the required services. However, in the present case, Engineer A is being pressured by his manager to assume responsibilities for which Engineer A has conscientiously determined to be in areas beyond his professional knowledge and skills. Supervisor B is not an engineer, and while technically engaged in the unlawful practice of engineering, by his actions Supervisor B is exerting duress upon Engineer A which is deeply troubling.

As a young professional engineer just starting out, Engineer A needs to dig deeper into this issue than already indicated under the facts. He should consider having a frank conversation with Supervisor B regarding the precise implications of Engineer A signing off on the testing design, including Engineer A's obligation not to sign or seal work for which he may not possess competence. Is this a final design under which testing procedures will be based in production, or is this an interim step in the process? In this connection, is there a method under which Engineer A could clearly document the apparent ambiguity and lack of conclusiveness in the design of testing procedures, protocols, and standards as part of his finalization of the report? In sum, there may be a middle ground through which Engineer A may be able to satisfy his personal ethical and professional concerns and also fulfill the request by Engineer A's supervisor.

Answers to these fundamental questions will ultimately determine the steps Engineer A will need to take in connection with the request by Supervisor B.

Conclusions:

- (1) Engineer A should consider having a frank conversation with Supervisor B regarding the precise implications of Engineer A signing off on the testing design, including his obligation not to sign or seal work for which he may not possess competence. Engineer A should also explore with Supervisor B whether there is a method under which he could clearly document his concerns in the design of testing protocols and standards in his contributions to the report.

- (2) Engineer A should not assume the responsibility by signing the sealing work for which he lacks technical competence.

Board of Ethical Review:

Curtis A. Beck, P.E., F.NSPE

Mark H. Dubbin, P.E., NSPE

Robert C. Gibson, P.E., F.NSPE

Monte L. Phillips, Ph.D., P.E., F.NSPE

Samuel G. Sudler III, P.E., NSPE

Mumtaz A. Usmen, Ph.D., P.E., F.NSPE

Michael L. Shirley, P.E., F.NSPE, Chair

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