Report on a Case by the Board of Ethical Review

Case No. 88-5

Signing of Drawings By Engineer In Industry

Facts:
Engineer A is employed by a computer manufacturing company. She was responsible for the design of certain computer equipment several years ago. She signed off on the drawings for the equipment at that time. Although Engineer A's design was properly prepared, the equipment manufacturing process was faulty and, as a result, the equipment became too costly and suffered mechanical breakdown. The manufacturing division made a number of recommended modifications to her design that it believed would help reduce costs in the manufacturing process. Engineer A's analysis of the manufacturing division's recommendations revealed that they would reduce the reliability of the product and greatly increase the downstream costs to the company through warranty claims. Engineer A's supervisor, who is not an engineer, asks Engineer A to sign off on the changes for the new computer equipment. There is nothing to suggest that the equipment would pose a danger to the public health and safety. Engineer A raises her concerns to her supervisor but nevertheless agrees to sign off on the changes without further protest.

Question:
Did Engineer A fulfill her ethical obligation by signing off on the changes without further action?

References:
Code of Ethics - Section II.1. - "Engineers shall hold paramount the safety, health and welfare of the public in the performance of their professional duties."

Section II.1.a. - "Engineers shall at all times recognize that their primary obligation is to protect the safety, health, property and welfare of the public. If their professional judgment is over ruled under circumstances where the safety, health, property or welfare of the public are endangered, they shall Case 88-5 notify their employer or client and such other authority as may be appropriate."

Section II.1.b. - "Engineers shall approve only those engineering documents which are safe for public health, property and welfare in conformity with accepted standards."
Section II.2.b. "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.4. "Engineers shall act in professional matters for each employer or client as faithful agents or trustees."

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Section III.2.b. "Engineers shall not complete, sign, or seal plans and/or specifications that are not of a design safe to the public health and welfare and in conformity with accepted engineering standards. If the client or employer insists on such unprofessional conduct, they shall notify the proper authorities and withdraw from further service on the project."

Discussion:
This case raises a fundamental issue concerning the professional integrity of engineers and the ethical obligations engineers owe to their employers, clients, and others. How far must engineers go in stating concerns in matters which directly involve their judgment as professional engineers but do not directly impact upon the public health and safety?

It is clear from the Code of Ethics and from previous Board of Ethical Review opinions that in matters involving the public health and safety, the engineer has an ethical obligation to "stand firm" and take action to protect the interest of the public. The Code is replete with provisions which reinforce the view that engineers have a fundamental obligation to the public welfare and if their judgment is overruled under circumstances which endanger the public, the engineers should notify employers, clients, or such other authority as maybe appropriate.

This point was most recently illustrated in Case 84-5. There, a client planned a project and hired Engineer X to furnish complete engineering services for the project. Because of the potentially dangerous nature of implementing the design during the construction phase, Engineer X recommended to the client that a full-time, on-site representative be hired for the project. After reviewing the completed project plans and costs, the client indicated to Engineer X that the project would be too costly if such a representative were hired. Engineer X proceeded with work on the project. In ruling that it was unethical for Engineer X to proceed with work on the project knowing that the client would not agree to hire a full-time, on-site representative, the Board noted that: "Engineer X made a professional judgment based upon education, expertise and experience that a full-time, on-site project representative would be necessary during the construction phase of the project because of the dangerous nature of the project. This was presumably a determination which was made after a careful and thorough weighing of the costs of the full-time, on-site representative versus the benefits of having such a representative. It may very well be that the state engineering registration board's rules of professional conduct may not specifically require Engineer X to make the determination that was made; however, it appears that the NSPE Code of Ethics does contain provisions which address this point."

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The Board concluded by noting: "When the client indicated that the project would be too costly if a full-time, on-site project representative was hired, Engineer X acceded to the client's wishes and proceeded with the work despite the fact that Engineer X believed that to proceed, without an on-site project representative, would be potentially dangerous. Engineer X did not force the issue or insist that a project representative be hired. Instead, Engineer X "went along" without dissent or comment. If Engineer X's ethical concerns were real, which we presume they were, Engineer X should have insisted that the client hire the on-site project representative or refuse to continue to work on the project. While this might appear to be a harsh result, we think that such an approach is the only one that would be consistent with the Code of Ethics."

As we noted earlier, the ethical concerns involved in Case 84-5 directly related to the engineer's ethical obligation to protect the public health and safety. In the instant case the ethical concern is less a matter of the protection of the public health and safety and more a matter of engineering judgment which is being overruled by her supervisor on the basis of non-engineering criteria.

In addition, we should also note at this juncture that the NSPE Code of Ethics makes it clear that the engineer has an ethical obligation to act in professional matters for her employer as a "faithful agent and trustee." In this regard, to what extent would this provision in the Code of Ethics impact upon any obligation which an engineer might have to "stand firm," in a difference of opinion, with an employer on a matter which does not have a direct impact upon the public health and safety?

We believe these seemingly conflicting provisions of the Code of Ethics can be reconciled. While it is clear that the engineer should act consistently with the interests of her employer and not act disloyally by impugning the motives of her employer in any way, we also think it is vitally important for an engineer whose professional judgment is overruled to clearly explain the reasons for her position and vigorously engage those persons who disagree with her judgments in a serious debate as to the technical issues involved. Here, Engineer A was asked to approve modifications which she believed, based upon her technical knowledge, would not be in the long-term interests of her employer. Since she possessed the engineering expertise, experience, and background to make these determinations and was presumably hired to provide that input to the company, it would seem that she would clearly be performing as a "faithful agent and trustee" if she were to make her concerns known to those in management who were most directly concerned with the long-term interests of the company. We cannot see how an engineer could be said to be acting as a "faithful agent or trustee" by silently assenting to a course of action which will have serious long-term ramifications for an employer. Engineers should be vocal on technical issues in which they possess knowledge and should not merely serve as a "rubber stamp" on engineering matters. Section II.4. should not be used as a "crutch" for engineers to avoid confronting difficult professional decisions, but instead as a basis for providing their employers and clients with critical engineering judgments and determinations.

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Finally, we would add that since Engineer A's immediate supervisor was not receptive to her concerns, we believe Engineer A had an ethical obligation to bring this matter to the attention of NSPE Board of Ethical Review those in management at a higher level than her immediate supervisor. Prior to taking this action, we believe Engineer A should explain to her immediate supervisor her professional and ethical obligations under the circumstances and disclose her course of action.

Conclusion:
Engineer A did not fulfill her ethical obligation by signing off on the changes without further action.

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