Report on a Case by the Board of Ethical Review

Case No. 63-6

Subject: Conflicting Engineering Opinions
Canon 5-Canons of Ethics; Canon 7-Canons of Ethics; Canon 24- Canons of Ethics; Rule 10-Rules of Professional Conduct.

Facts:
A state legislature has pending various bills involving water supply, flood control and production of electric power. The most efficient and economical method to achieve the desired result has been debated within the legislature and among the citizenry generally for several years. Hearings are called by a committee of the state legislature to receive comments and recommendations on the various proposals which have been offered. A professional engineer representing the state power commission testifies that engineering studies by him and his professional colleagues indicate the most efficient solution from an engineering standpoint is a series of low dams. Another professional engineer, representing a private power company, testifies that his engineering analysis indicates a more effective and less expensive solution, producing the same results, by using one high dam. Each engineering witness submits voluminous engineering data in support of his position, and freely criticizes the analysis and findings of the other.

Question:
Is there a violation of the Canons of Ethics by one or both engineers' in offering conflicting opinions or in criticizing the work of the other at a hearing on an engineering project in the interest of the public?

References:
Canons of Ethics-Canon 5- "He will express an opinion only when it is founded on adequate knowledge and honest conviction while he is serving as a witness before a court, commission or other tribunal."

Canon 7-"He will refrain from expressing publicly an opinion on an engineering subject unless he is informed as to the facts relating thereto."

Canon 24- "He will exercise due restraint in criticizing another engineer's work in public, recognizing the fact that the engineering societies and the engineering press provide the proper forum for technical discussions and criticism."

Rules of Professional Conduct Rule 10-"He will not advocate or support enactment of community laws, rules, or regulations that he believes are not in the public interest."

Discussion:
Some aspects of an engineering problem will admit of only one conclusion, such as a mathematical equation, but it is a fallacy to carry this statement to the ultimate

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conclusion that all engineering problems admit of only one correct answer. Particularly in large and complicated engineering problems, such as a water-power complex, there may be many approaches, all based on sound engineering principles. Large public projects are notably in this category, and the approach finally adopted may properly reflect not only engineering diagnoses, but also determinations of public policy. Engineering judgment from exclusively an efficiency and cost standpoint may conclude that a proposed highway should be built through the heart of a heavily populated residential district. Public policy may dictate, however, that the highway should be built at greater cost and less efficiency through a lightly populated area. An engineer who presents either point of view cannot be said to be "incorrect."

There may also be honest differences of opinion among equally qualified engineers on the interpretation of the known physical facts. Assuming complete factual agreement on such factors as water flow, soil conditions, rate of evaporation, past rainfall, runoff, etc., engineers can and do arrive at different conclusions based on their best understanding of the application of those facts. Also, it should be recognized that in the type of case at hand the engineers must base their opinion on estimates of indeterminate factors, e.g., construction cost by one method or another, population growth, economic development of the area and possible future trends in more efficient equipment.

Canons 5 and 7 refer to expression of "opinion," confirming the idea that the engineer is called upon for the expression of his judgment, not the mere recital of known engineering data. Rule 10 refers to the engineer being an "advocate" of a position, again recognizing that contrary conclusions are to be expected. The practice of engineering is "the application of special knowledge of the mathematical, physical, and engineering sciences to ... creative work. . . ." (Section 2 (d), Model Law).

The only Canon which need give us pause is Canon 24 dealing with public criticism of the work of another engineer. But Canon 24 does not prohibit such public criticism; it only requires that the engineer apply "due restraint." We take this language to mean that in offering public criticism of the work of another engineer, the engineering witness will avoid personalities and abuse, and will base his criticism on the engineering conclusions or application of engineering data by offering alternative conclusions or analyses. Canon 24 implies that engineering criticism should be confined to engineering society gatherings and the engineering press. However, this should not be interpreted as interfering with the duty of the engineer to his client, employer or the public to offer his expert knowledge and opinion to public bodies which bear the responsibility for acts of public importance. Canon 5 recognizes the expression of opinion on engineering matters in connection with testimony before courts, commissions and other tribunals. We believe that the wording of Canon 5 can be extended to public hearings and procedures.

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Conclusion:

It is not unethical for engineers to offer conflicting opinions on the application of engineering principles, or to criticize the work of another engineer, at hearings on an engineering project, in the interest of the public, provided such criticism is offered on a high level of professional deportment.

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