

## ENGINEERS AS EXPERT WITNESS

Frequently engineers are required to act as consultants and provide expert opinion and views in many legal cases of the past events. They are required to explain the causes of accidents, malfunctions and other technological behavior of structures, machines, and instruments, e.g., personal injury while using an instrument, defective product, traffic accident, structure or building collapse, and damage to the property, are some of the cases where testimonies are needed. The focus is on the past.

The functions of eye-witness and expert-witness are different as presented in the Table

### Eye-witness and expert-

#### witness *Eye-witness*

1. Eye-witness gives evidence on only what has been seen or heard actually (perceived facts)

#### *Expert-witness*

1. Gives expert view on the facts in their area of their expertise
2. Interprets the facts, in term of the cause and effect relationship
3. Comments on the view of the opposite side
4. Reports on the professional standards, especially on the precautions when the product is made or the service is provided

The engineers, who act as expert-witnesses, are likely to abuse their positions in the following manners:

#### **1. *Hired Guns***

Mostly lawyers hire engineers to serve the interest of their clients. Lawyers are permitted and required to project the case in a way favorable to their clients. But the engineers have obligations to thoroughly examine the events and demonstrate their professional integrity to testify only the truth in the court. They do not serve the clients of the lawyers directly. The hired guns forward white lies and distortions, as demanded by the lawyers. They even withhold the information or shade the fact, to favor their clients.

#### **2. *Money Bias***

Consultants may be influenced or prejudiced for monitory considerations, greputation

### 3. **Ego Bias**

The assumption that the own side is innocent and the other side is guilty, is responsible for this behavior. An inordinate desire to serve one's client and get name and fame is another reason for this bias.

### 4. **Sympathy Bias**

Sympathy for the victim on the opposite side may upset the testimony. The integrity of the consultants will keep these biases away from the justice. The court also must obtain the balanced view of both sides, by examining the expert witnesses of lawyers on both sides, to remove a probable bias.

#### **Duties**

1. The expert-witness is required to exhibit the responsibility of *confidentiality* just as they do in the consulting roles. They can not divulge the findings of the investigation to the opposite side, unless it is required by the court of law.
2. More important is that as witness they are *not required to volunteer* evidence favorable to the opponent. They must answer questions truthfully, need not elaborate, and remain neutral until the details are asked for further.
3. They should be *objective* to discover the truth and communicate them honestly.
4. The stand of the experts depends on the *shared understanding* created within the society. The legal system should be respected and at the same time, they should act in conformance with the professional standards as obtained from the code of ethics.
5. The experts should earnestly be *impartial* in identifying and interpreting the observed data, recorded data, and the industrial standards. They should not distort the truth, even under pressure. Although they are hired by the lawyers, they do not serve the lawyers or their clients. They serve the justice. Many a time, their objective judgments will help the lawyer to put up the best defense for their clients.

### **ENGINEERS AS ADVISORS IN PLANNING AND POLICY MAKING Advisors**

The engineers are required to give their view on the future such as in planning, policy-making, which involves the technology. For example, should India expand nuclear power options or support traditional energy sources such as fossil fuels or alternative forms like solar and wind energy? In the recent past, this topic has created lot of fireworks, in the national media.

Various issues and requirements for engineers who act as advisors are:

#### 1. **Objectivity**

The engineers should study the cost and benefits of all possible alternative means in objective manner, within the specified conditions and assumptions. ROHINI COLLEGE OF

## **2. Study All Aspects**

They have to study the economic viability (effectiveness), technical feasibility (efficiency), operational feasibility (skills) and social acceptability, which include environmental and ethical aspects, before formulating the policy

Engineers have to possess the qualities, such as (a) honesty, (b) competence (skills and expertise),

(c) diligence (careful and alert) (d) loyalty in serving the interests of the clients and maintaining confidentiality, and (e) public trust, and respect for the common good, rather than serving only the interests of the clients or the political interests.

## **2. Technical Complexity**

The arbitrary, unrealistic, and controversial assumptions made during the future planning that are overlooked or not verified, will lead to moral complexity. The study on future is full of uncertainties than the investigations on the past events. On the study of energy options, for example, assumptions on population increase, life style, urbanization, availability of local fossil resources, projected costs of generating alternative forms of energy, world political scenario, world military tensions and pressures from world organizations such as World Trade Organisation (W.T.O.) and European Union (EU) may increase the complexity in judgment on future.

## **3. National Security**

The proposed options should be aimed to strengthen the economy and security of the nation, besides safeguarding the natural resources and the environment from exploitation and degradation.

For the advisors on policy making or planning, a shared understanding on balancing the conflicting responsibilities, both to the clients and to the public, can be effected by the following roles or models:

### **1. Hired Gun**

The prime obligation is shown to the clients. The data and facts favorable to the clients are highlighted, and unfavorable aspects are hidden or treated as insignificant. The minimal level of interest is shown for public welfare.

### **2. Value-neutral Analysts**

This assumes an impartial engineer. They exhibit conscientious decisions, impartiality i.e., without bias, fear or favor, and absence of advocacy

### **3. Value-guided Advocates**

The consulting engineers remain honest (frank in stating all the relevant facts and truthful in interpretation of the facts) and autonomous (independent) in judgement and show paramount importance to the public (as different from the hired guns

#### **MORAL LEADERSHIP**

Engineers provide many types of leadership in the development and implementation of technology, as managers, entrepreneurs, consultants, academics and officials of the government. Moral leadership is not merely the dominance by a group. It means adopting reasonable means to motivate the groups to achieve morally desirable goals. This leadership presents the engineers with many challenges to their moral principles. Moral leadership is essentially required for the engineers, for the reasons listed as follows:

1. It is leading a group of people towards the achievement of global and objectives. The goals as well as the means are to be moral. For example, Hitler and Stalin were leaders, but only in an instrumental sense and certainly not on moral sense.
2. The leadership shall direct and motivate the group to move through morally desirable ways.
3. They lead by thinking ahead in time, and morally creative towards new applications, extension and putting values into practice. 'Morally creative' means the identification of the most important values as applicable to the situation, bringing clarity within the groups through proper communication, and putting those values into practice.
4. They sustain professional interest, among social diversity and cross-disciplinary complexity. They contribute to the professional societies, their professions, and to their communities. The moral leadership in engineering is manifested in leadership within the professional societies. The professional societies provide a forum for communication, and canvassing for change within and by groups.

**Voluntarism:** Another important avenue for providing moral leadership within communities, by the engineers is to promote services without fee or at reduced fees (pro bono) to the needy groups. The professional societies can also promote such activities among the engineers. This type of voluntarism (or philanthropy) has been in practice in the fields of medicine, law and education. But many of the engineers are not self-employed as in the case of physicians