# EXPERIENCES OF AN EXPERT WITNESS

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## 1. INTRODUCTION

The word 'forensic' originates from 'forum' which in use has come to mean legal assemblies.

In Civil law the disputes are between 'plaintiff' and 'defendant' individuals or organizations. Criminal law deals with crime and legal punishment where the Government is always the 'prosecution', and the charged person or organisation is the defendant. It may also happen that a private plaintiff sues a statutory body which then becomes the defendant.

A forensic engineer will have the opportunity, privilege and challenge of appearing in Court to testify on behalf of a client or an employer (both referred to as 'client' in the rest of the paper) for Plaintiff (or Prosecution) or Defence, or even a third party involved in a case.

Not all accident investigations end up in Court. Many Civil cases get settled out of Court when the accused party finds that proof against it is too strong, and prefers to settle the issue with the plaintiff in a mutually acceptable settlement, rather than proceed in Court and after a long time and much expense lose the case. Mediation and arbitration are other options.

I have investigated accidents on behalf of the Government, companies, and injured victims. But I am no lawyer. What little I know by testifying in Court has taught me how complicated law is or can get. I will therefore not discuss legal procedures, and defer to lawyers to clarify legal points. I will only comment on my ventures into the legal systems with which I have experience as a forensic engineer and expert witness.

Any error in legal procedural details may be attributed to my ignorance, or fading memory – I do not wish to be held legally responsible for the outcome!

While a 'lawyer' is anybody who has passed a law examination, an 'attorney' is one who is licensed to practice law in courts. However, I shall use both terms interchangeably in this paper. I will use following abbreviations to save repetition of same phrases many times:

EW – Expert Witness, I, you
OC – Opposing Counsel, the other side
WC – Witness's Counsel, my side, your side

Use of male pronoun or other reference would automatically cover the female equivalent except when either one is implied by context.

As professional courtesy and due to legal constraints, I will not be giving actual names, dates, places, or identification most of the time. Any specific mention will be only whatever is documented common knowledge from public domain. Other similarities are coincidental.

## 2. WHO IS AN EXPERT WITNESS?

The West recognises a difference between an "expert consultant" and an "expert witness". A consultant (or adviser) may be someone whom a client believes to be especially knowledgeable to assist with certain technical aspects of a problem. When the expert is retained to testify in Court based on his credentials and findings, he becomes an EW.

### 2.1. Definitions of Expert Witness

Among the many definitions of an EW that exist, I like Ratay's choices, [1]:

*(i) "A non-biased professional who provides testimony based upon his/her technical expertise."*

*(ii) "A person who, by reasons of education or special training, possesses knowledge of some particular subject area in greater depth than the public at large."*

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Only the courts can decide if one is allowed to testify as an EW. According to US Federal Rules of Evidence, an expert may be allowed to testify under the following conditions:

- Scientific, technical, or other specialized knowledge will assist the Court to understand the evidence or to determine a fact in issue;
- Witness can be qualified as an expert by knowledge, skill, experience, training, or education;
- Testimony is based on sufficient facts or data and is the product of reliable principles or methods;
- Witness has applied the principles and methods reliably to the facts of the case; and,
- Opinion is sufficiently relevant to the facts of the case.

ASCE's guidelines on forensic engineering, [2] define four criteria for the admissibility of what the expert testifies:

1. Peer review and publications,
2. Rate of error,
3. Empirical testability, and,
4. General acceptance within the scientific community.

### 2.2. Qualifications for an Expert Witness

Both courts and industry recognise that an EW must possess sufficient expertise and mastery over his claimed area of speciality by demonstrating the following five key attributes:

1. Education,
2. Training,
3. Experience,
4. Skill (evaluated as accuracy *plus* efficiency *plus* timeliness), and,
5. Knowledge,

These overlap the qualifications for being a forensic engineer, which I have discussed in another paper, [3]. Other special attributes to be an EW would be the ability and willingness to face intense questioning under stress and respond with clarity and confidence.

Attributes listed here may overcome any deficiencies in other items that are considered basic to a forensic engineer, such as not being a P.E. I am not a P.E. in Singapore, but I am accepted as an EW there.

## 3. BECOMING AN EXPERT WITNESS

### 3.1. Getting started

Talk to an EW. Attend one or two Court sessions when EW is on the stand. Understand all the legal nuances of being an EW. Then if you still want to become an EW, get going.

- Advertising is an obvious option, but ads must be carefully drafted with legal advice. What you advertise may be brought up in Court to your disadvantage. However, personal advertising has not been found to be effective in getting forensic business.
- Join a forensic engineering company; most advertise their services.
- Contact legal firms known for accident litigation. They get accident litigation business first and foremost; lawyers seek out EW. Insurance companies are a close second.
- Inform your local professional society of your interest. They get queries for experts. Institution of Engineers (Singapore) has an 'Expert Panel' for members to apply.
- If you are good in design and safety areas and already a consultant, clients will come to you, or somebody will refer a client to you. University faculty are in demand when an accident investigation becomes necessary, because of their publications and seminar lectures. Their ex-students will be good contacts. Such referrals are the best.
- If you speak at conferences/seminars, mention your interest in accident investigation.

In sum, the more you present your ideas publicly to various groups, the more people will remember them and contact you.

The first case will be your most difficult one. After that, demand will go up (especially if you do well) and soon you will have enough to pick and choose.

***Personal Experience – 1:***

In USA of the 1960s, it was my specialising in the (then new) area of Matrix and Finite Element Analysis that gave me a boost to my research and consultancy. Soon I started getting requests to become an EW. But, I decided not to become an EW myself (mainly because of the high professional liability) but to act as consultant for accident investigators and EWs with my back-up analysis and testing. That was how I learnt the ropes of being an EW.

In Singapore, even before I could think of actively entering forensic engineering, I received enquiries and assignments by referrals. My courses, seminars, workshops and publications on workplace safety and risk management also helped my forensic engineering.

***(1-End)***

**3.2. Which cases to accept**

A forensic engineer may choose to remain an expert consultant and not an EW (as I was in the USA). But you must tell your client that you don't want to be an EW up front, and not half way through. On the other hand, you may be directly requested to be an EW.

Anyway, the acceptance of an assignment should be a carefully considered decision to accept to be an EW, and not a casual one.

All Court appearances are stressful in one way or another, to a smaller or greater degree. Lawyers are dependent on the EWs they select, and are also subject to stress from EWs and their performance in the case. So your wrong decision may hurt more than just you.

Shuirman and Slossom, [4] give a checklist to decide how to decide on an assignment:

1. Be certain there are no conflicts of interest with any of the parties connected with the lawsuit, directly or indirectly.
2. Obtain as much background information on the accident or failure as possible, mindful that such information may be biased or lack pertinent data.
3. Attempt to separate facts from opinions so as to be able to form an objective early picture of the main issues.
4. Inquire as to the status of the case and its tentative schedule to determine whether there is sufficient time for a thorough investigation.
5. Make certain the matter is within the appropriate areas of expertise for you or your firm.
6. Discuss fee schedules and determine when and by whom payments will be made.
7. Check out the reputation of the lawyer or law firm if it is not already known.

***Personal Experience – 2:***

Probably because of my age (82) and current indifference to a career as such, nowadays I take up only those cases that satisfy two personal criteria:

- It must be challenging and not routine (which anybody can do); and/or,
- It must be something through which I can constructively benefit some individual who I believe could have been better protected against loss or injury, or benefit some industry or society in general, in a way that would improve the local safety culture.

***(2-End)***

## 4. ROLE AND RESPONSIBILITY OF AN EXPERT WITNESS

### 4.1. Obligations of an Expert Witness

The forensic engineer/expert witness has dual obligations, [1]:

- To the Court – Assist in understanding the complicated technical subjects that are not within the knowledge of the average person.
- To the Client – Assist the attorney with the technical information he needs to develop the case, provide expert opinion, and give expert testimony, if called upon.

The Inter-professional Council on Environmental Design (ICED)/Association of Soil and Foundation Engineers (ASFE) has a very good list of obligatory directives for EWs, [5]:

- Avoid conflicts of interest and the appearance of conflicts of interest.
- Undertake an engagement only when qualified to do so, and when you can rely upon other qualified parties for assistance in matters beyond your area of expertise.
- Consider other practitioners' opinions relative to principles associated with the matter.
- Obtain available factual information relative to events in question to minimize reliance on assumptions, and be prepared to explain any assumptions to the Court.
- Evaluate reasonable explanations of causes and effects.
- Assure integrity of tests and investigations conducted as part of the expert's services.
- Testify about professional standards of care only with knowledge of those standards which prevailed at the time in question, based upon reasonable inquiry.
- Use only those illustrative devices or presentations which simplify or clarify an issue.
- Maintain custody and control over whatever materials are entrusted to your care.
- Respect confidentiality about the assignment.
- Refuse or terminate involvement in the engagement when fee is used in an attempt to compromise your judgment.
- Refuse or terminate involvement when you are not permitted to perform investigation you believe is necessary to render an opinion with a reasonable degree of certainty.
- Maintain a professional demeanour and be dispassionate at all times.

### 4.2. Role of Expert Witness

Ideally, the expert discharges his obligations to both the Court and to the client equally – but justice's demand for truth may be in conflict with client's need for helpful testimony.

You must remember that you are first an expert and only second a witness for one side or the other in the litigation. Before you accept the assignment you must be fairly clear if the aspects of the case you will be analysing and presenting will be (mostly) for or against the potential client. If you go into a case blind, you will be either pressured to limit your testimony to only the supporting points (if not actually 'massage' them in the client's favour!) or you will be summarily dropped from the case, hopefully after payment of some fee.

In the words of ASCE, [2] *"Forensic engineers do not win or lose trials; lawyers do. The Forensic engineer, therefore, has no track record of success or failure in litigation. The Forensic engineer's role at trial is to present opinions in a believable and credible way. That is the ultimate determination of success as an expert witness."*

It is hard for EW to remember he is not 'working for' the client who pays him. It is harder for the client who is paying for EW's services to accept EW is not looking out solely for him.

Clients are jubilant when they win and want to pay you more, but they are bitter and recriminatory when they lose. Lawyers do tell the EW and the client that the EW's role is to bring in technical clarity to the case and not take sides. But they too have a stake in the EW because usually they are the ones who pick and recommend the EW to the client.

**4.3. Selective support by Expert Witness**

If you cannot or do not want to handle all aspects of a case, you should tell the client the strong and weak points of the case, and detail which portions you will support and which not.

- But this is not a complete solution, because the opposing side will be watching for areas that you do not cover, and pounce upon them demanding your opinion under oath, so that anything against your side and/or supporting their side may be revealed.

So you will have to be careful how you answer questions involving your judgement.

- The OC may ask, *"Do you agree that your client was wrong?"* You may respond with: *"I am not aware of all the circumstances of that situation"* or *"That is for the Court to decide."* A simple *"No"* may only lead to further questions.
- Meanwhile, your lawyer can (and should) object to the OC 'badgering' you, and the judge may sustain the objection and get you off the hook.

As a consultant to your client, you have a professional responsibility to assist him – technically, not legally – to the best of your ability. However, your responsibility does not extend to slanting your testimony in his favour contradictory to facts or good practice. Your duty to truth and society transcends your loyalty to your client.

If it gets messy after you have started, you may withdraw, but it will hurt your reputation, and there may be liability on you depending on the terms of the contract.

The lawyer's role is clearer, charged with representing the client, managing his litigation, and winning the case. He selects an EW who he hopes will help the case, and not just find truth. He will seek and use only information that will help the case, and manage EW testimony to maximum advantage to the client, without of course violating facts or truths.

The EW in Court should not volunteer all the information he knows on the case, but should only respond to the lawyer's questions from both sides.

- However, if OC directly asks your opinion on a critical matter and you know the answer, you must give it (limiting it to the reasonable minimum) damaging though it might be to your client's case. Otherwise you run the risk of being branded as not being so expert after all, or charged with being unethical in your profession.

The responsibility of the EW is to investigate the accident or failure as thoroughly and fully as possible. But the form, extent, and content of the disclosure are the client and lawyer's choice, as long as EW's representation of them is truthful.

OC may well ask: *"Are you being paid for your testimony?"* Although it is quite fair that you are paid for serving as EW, ASCE, [2] recommends that you answer, *"I am being paid for my time"* [– I may add, *"and my expertise*'] *"and not for my testimony."*

**4.4. Adversarial relationship**

Although the dispute is between two litigating parties and <u>not</u> between the two experts, each EW, however senior he may be, should be prepared for confrontation from the opposing side.

Courts are adversarial in nature. The two sides are expected to fight it out in Court, with judge as referee. So OC will hit hard on the EW at every opportunity. Counsels get a lot of leeway in their examination so that they may ferret out truth, which after all is what judges also want. Judges may often overrule WC's objection to OC's aggressive line of questioning.

- The other side will certainly have expert opinions to support their side and quash your side. It is your responsibility to compare both sets of ideas and clarify the issues.
- Even in science-based engineering, there could be more than one way to solve a problem, more than one type of curve to fit a set of data, more than one cause for a failure, and most important truth of all, more than one trigger for an accident.

So don't be surprised or upset if your pet theories to explain your client's side of an accident are shot down or at least countered by an equally hot theory from the other side. You will be smart to

think ahead of all possible scenarios so that you won't be caught napping.

- When an alternative conclusion is offered by other side, accept it in principle unless you can counter it with valid arguments.
- When new facts are adduced by them, accept them gracefully and attempt to modify your own findings to fit the new information.

Despite this tension, you must maintain a professional demeanour and courteous interface with opposing lawyers and experts, and not try to 'score' points for your side at all costs.

Sometimes, in spite of your best efforts, all your labours might seem to have been in vain.

***Personal Experience – 3:***

In the case of a formwork failure, I came up with three scenarios for the prosecution and the defence came up with a fourth. But on the last day of testimony, a witness presented evidence which produced a fifth feasible scenario.

The case was simply thrown out, as the prosecution could not prove their case 'beyond reasonable doubt' – and this, after weeks of battling by the contending parties!

***(3-End)***

The point here is, disappointing as this sounds, the EW should not care about outcome. It took me quite a while to understand and accept that the legal argument is quite different from engineering logic. You may have done everything right, but still nothing may come out of it!

### 4.5. Relationship to the legal system

The EW is obligated to the lawyers on both sides and the judge for certain acts:

- The EW may generally be required to explain and simplify technical points to the judge and legal teams as well as to the media and through them to the public.
- He should participate in strategy meetings with his lawyers.
- He must participate in discovery disclosures (i.e. preliminary meetings of the legal teams), technical requests, discussion of cross-examinations by opposing experts, etc.
- He should satisfy the Court of his credentials and answer all questions on them.
- He should abide by the 'Do-s' and 'Don't-s' of courtroom and testimony protocol proffered by the lawyers.

In all the preceding, he must not be influenced to re-align his comments in any way just to benefit their side, but be objective, and not stray from his convictions.

EW is in the unique position of not being part of the dispute, and only contributing his expertise on behalf of his client. To that extent, he can be an instrument of revealing the truth and promoting progress in his speciality for the benefit of all concerned.

- If both sides agree, both experts can meet and discuss their differences, and if the problem will admit a consensus solution, present it to both sides and aim at agreeing on precise measures to repair the damage and settle the compensation claims in a fair manner. This is good mediation. But first, both clients must like the idea!
- Out of the confrontation between opposing EWs, it may be expected that the judge can make a final decision based on the strength of the arguments from the two sides.

## 5. LEGAL PROCEDURES

### 5.1. Steps in a non-jury trial

In USA and UK most trials are by jury, but in Singapore and India the jury system has been abolished. The general procedure for non-jury trials is as follows:

1. Report of forensic engineer's investigation, his recent relevant CV, and supporting documents legalised with an affidavit will be submitted to the Court and the other side

as 'Discovery'.

2. The forensic engineer may be called for a discussion with both counsel and a deposition made of his responses. Based on the reports and discussion, decision on whether or not to call the forensic engineer as EW will be made. Court must approve.
3. Once Court testimony starts, the Prosecutor/Plaintiff lawyer calls his witnesses – this initial testimony is called 'Direct' testimony, or 'Examination-in-Chief';
4. Defence lawyer may cross-examine the witnesses;
5. Prosecutor/Plaintiff lawyer may do further questioning to clarify certain matters brought up during cross-examination – this is called 're-direct' or 're-examination';
6. Sometimes defence may again cross-examine the witness – this is called 're-cross';
7. Prosecutor closes the Government's case, or Plaintiff rests;
8. Defence may call witnesses, and Prosecutor/Plaintiff lawyer may cross-examine them;
9. Defence rests;
10. If the Prosecutor/Plaintiff presents 'rebuttal' witnesses/evidence to challenge evidence presented by the Defence during their phase of the trial, then there is another round of examinations before the Prosecutor/Plaintiff rests;
11. Prosecutor or plaintiff's lawyer presents a closing argument to the judge;
12. Defence lawyer presents a closing argument to the judge; and finally,
13. Judge returns a verdict, after an interval of time.

**5.2. Legal role of an Expert Witness**

If a deposition is taken from the forensic engineer, both parties will get an opportunity to fully explore opinions that he will offer at the trial, as well as to determine his credibility as an EW. Deposition can be lengthy and go into great detail, and as such can be very stressful to the forensic engineer. Often, depositions may be by report and affidavit from a consultant.

Trial testimony on the other hand generally will focus on key issues, aimed at searching for the truth. This will however place the EW in the spotlight where every word and every gesture will count for or against him and his side.

Communication between experts and lawyers enjoy attorney-client privilege. But the forensic expert must be careful regarding the material he retains with him on the case because all materials hand-written, typed, electronic (including e-mails and blogs), audio- and video-tapes, photographs, sketches, drawings, doodles, notes, diaries, memos, letters, working drafts as well as final reports, etc. can be demanded by the opposing side through the Court.

Bad news of a provable mistake by the client – after thorough confirmation by the expert – must be communicated to the client and the lawyers as promptly and clearly as good news. If some error is not informed and opposing side finds it and brings it out, it will reflect badly on the EW's credibility and ethics, apart from damaging his client.

It is wise not to put bad news in writing of any form. In certain privileged relationships, these may not have to be disclosed. It would be best to be guided by counsel in this matter.

In case a site visit or examination of designs or drawings shows a highly hazardous situation which may escalate into a catastrophe involving human injury, environmental damage, or great property loss, the forensic engineer must first inform the employer/client and if no immediate response is forthcoming, then inform the appropriate public official about the danger, without revealing unnecessary information incriminating his client.

The judgement is mostly based on the evidence presented by the two sides. Most law is argued on the basis of precedents, that is, on past cases with similar features. Lawyers on both sides scramble to find cases where the judgement has been delivered under similar circumstances in their particular side's favour, and it is for the judge to sort out the validity and strength of the two sets of arguments, utilising additional precedents of his own.

That a judgement itself can be arguable if not outright wrong is borne out by the fact that many

times the judgement of a lower Court is reversed or annulled by the higher Court.

**5.3. Witness Counsel's support to Expert Witness**

Lawyers confer with EW many times and at length with a three-fold purpose, to:

(i) Brief EW on Court protocol and coach him on their line of questioning;

(ii) Be briefed on the technicalities of EW's work and learn about fruitful lines of questioning to give EW full scope to explain or clarify; and,

(iii) Understand other side's technicalities, and frame questions to attack their weak spots.

Of these, the first function is very critical to the EW. Lawyers are usually smarter and better-read than most lay persons. They are more aggressive and better communicators. The EW better follow counsel's advice on Court behaviour. They may even have tidbits about the particular judge you will be facing, what he tends to overlook and what he gets upset about.

If you are new to the game, lawyers will tell you how to dress, how to sit, stand, move your hands, keep your face from smirking or frowning, not hem or haw, not get upset, not try to score debate points, not interrupt the questioner – and not answer too quickly.

But more than that, they would rehearse you with all kinds of questions and prepare you to look for traps set by the OC. If a session with you on the stand does not go over well (for your client) they will corner you later and do a post-mortem on every word you said or did not say, and frankly state you disappointed them and came through as weak, even unsure.

Naturally, you have to say you will try harder the next day ... and you certainly will.

Even if you are experienced, each legal team has a different style, and WC will want to tell you all about it – it may be good for you to listen and not say, *"I know, I know ..."*

***Damage control:***

Most of all, WC is at his best at 'damage control', if and when you mess up their strategy.

As EW, you believe you have built up an unassailable edifice of unshakable science in your client's favour. Alas, this rarely happens. To put it bluntly, you will be lucky to get off with half your testimony intact. After all, the other side's business is to demolish your testimony, like the boxer's goal of downing his opponent in the first round.

By his crafty questioning, OC may bring out a few inadequacies and even some inaccuracies in your investigation. You may say some things which could be ambiguous or vague. You grow more and more frustrated and nervous, unable to explain yourself at length like you can in class or in a meeting, but simply having to dodge the darts thrown at you by OC, until the blessed moment that OC grinds to a halt, leaving you exhausted, only because his quiver of arrows is empty, until replenished by his EWs and his client for the next day.

The only hope for salvation lies in WC's second round with you, the re-direct or re-examination This is purely to dig you out of the pit you dug for yourself ('accidental' though it might be) so that the fallout of your folly may not destroy your client's case completely.

Once OC has finished your cross, WC will try to get an adjournment, or at least ask for a break to confer with you. Then he will demand how come you did not know what the gaps, loopholes and weak-points were. You have to explain, apologise and promise to do better!

WC must now patch up holes blasted by the other side in his ship to save it from sinking. You will help draw up a list of questions through which you may clarify, expand upon, or even correct the damaging statements you made during the cross examination.

During re-examination, your lawyer may read out what you said the previous day, and ask *"What exactly did you mean by that?"* to give you a proper start. This works well for the case. But your lawyers may not go out of their way to correct all the wrongs done to you, unless it helps the case. Court time is too valuable to indulge in repairing ego bruises!

**5.4. Expert Witness's support to Witness Counsel**

For your part, you have to help WC build his case. Lawyers are not doctors, engineers, or accountants, unless they have specialised in one of these fields. They must be briefed on the technicalities, and naturally they look to you for guidance and briefing on terminology, principles, and critical details which will come up during testimony and examinations.

Remembering you cannot introduce any new piece of information or visual aid or model on the spot, you must make each statement self-explanatory and self-contained.

You must brief your counsel in simple and clear terms, with sketches and even models as necessary, not only for your work but also for the opposing side's testimony. They should be given a list of questions with the right terminology to ask you in direct examination, to elicit what you want to emphasise, and another list to debunk or embarrass the other side's EW.

You may be asked to assist them in Court during others' testimony, which you do sitting behind your lawyers' chairs and passing them slips of paper with your notes.

That can become hit or miss. If your lawyer senses your comment is critical, he can take Court's permission to confer, then huddle and talk in low voice, or take a five-minute break, go out and talk. When lawyers take a break, the judge retires to his chambers, and sometimes may get involved in some phone call or deep study, and the five minutes may extend to more.

More often, the paper slips are received by the junior sitting next to the questioning lawyer who is on his feet and has only a few seconds to glance at your slip while the witness is answering his question. If during your earlier discussions of potential scenarios you had happened to include the point on which you have now written a note, then the lawyer catches on easily and uses your suggestion. If he does not understand and cannot clear his doubt with a whispered question to you, he just has to give your suggestion the go-by.

It is indeed a weighty assignment which, if practised seriously and the briefing is thorough, can influence the direction of a case. So the EW has to be on his toes not just about his part in the case, but also about others' testimonies, as and when he is asked to assist.

***Personal Experience – 4:***

In one case, I had to face off against an EW (say Mr. X) with high credentials. Without going into details of the episode, the gist of it was that I got a lot of criticism from OC – naturally briefed by Mr. X – regarding the approximations of a certain dimension which I had estimated by the computer graphics technique I have described in another paper, [6].

The bone of contention was the 10% percentage variance I had cited for my values due to approximations I had made; their side claimed that my error could be worse than 10%.

After my testimony, my lawyer and I reviewed Mr. X's report and decided on the comeback. Next day when Mr. X took the stand, my lawyer queried Mr. X on how he determined the value he quoted for a similar item, and got him to admit it was an 'educated guess from experience', with no benefit of actual measurement or graphical estimate.

***(4-End)***

**5.5. Expert Witness's support to the Court**

The EW, being a non-litigant, has a duty to support the Court when the judge requires extra information on the material presented by him, or even on something related to it.

***Personal Experience–5:***

During my EW testimony on a rebar grid support failure the judge wanted me on two occasions to come up with information on the effects of the loss of one or more such supports, and of staggering of support alignment. I was able to come up with the required results and present them the next day. I have detailed this episode in two other papers, [3, 6].

These extra tasks were not a favour to the Court –the judge had a duty and right to get more information from any EW. I reiterate the item here to emphasise that EW has a duty to guide the Court as needed, even if all the new information produced may not help his case.

***(5-End)***

## 6. EXPERT WITNESS TESTIMONY

Almost universally, the Court is a place of strict decorum and rigid protocol. Everybody addresses everybody else in very polite, normal tones, regardless of the seriousness of the content or the heat of the argument. In U.S. courts there is often some theatrics, but in most other places, there is very little drama, except occasionally when the witness is actually or apparently sick or overcome by emotion, especially anger or sorrow.

### 6.1. Preparation

The first time an EW takes the stand can be quite unsettling, even for professors who are so used to facing big (and restive!) audiences. You are not accused of any wrongdoing, but you will still face severe questioning on your academic background and entire professional life for which you are so admired by your colleagues, relatives, friends, and well-wishers.

If you do well on the stand you will come out smelling roses. But if you do badly, you would lose a lot of credibility. Your lawyers help; but inside the Court, you are on your own.

Review the case and your part in it. Try to rest well the night before the testimony.

### 6.2. Taking the stand

Come well dressed, but comfortably and not flashily – don't fashion up in the latest shirt if the collar is a little too tight. You will have to loosen it during your testimony, and it will look sloppy and to critical eyes become a display of your nervousness.

Apart from a lunch break, you get a coffee break once during the morning session and once during the afternoon session, and any time the judge has need for a break. As EW you can always ask for a glass of water, a toilet break, or a recess if you are tired or hungry.

Figure 1 is my schematic version of a typical courtroom – photographs not being permitted in courts. Different countries and courts may have quite different arrangements.

In the picture, EW is seated at left in his cubicle. Court reporter and clerk sit in front of judge's table. The two legal teams have their separate spaces. A cart for the many files, and projection facilities for approved visuals are shown. Portraits of State Head and spouse, and a flag or two may adorn the judge's podium.

You will be led to your seat, and all documents will be ready at your table. After both legal teams have taken their places, the judge's entry will be announced with an '*All rise!*' and all will stand. The judge bows to the assembly, assembly bows in response, and all sit.

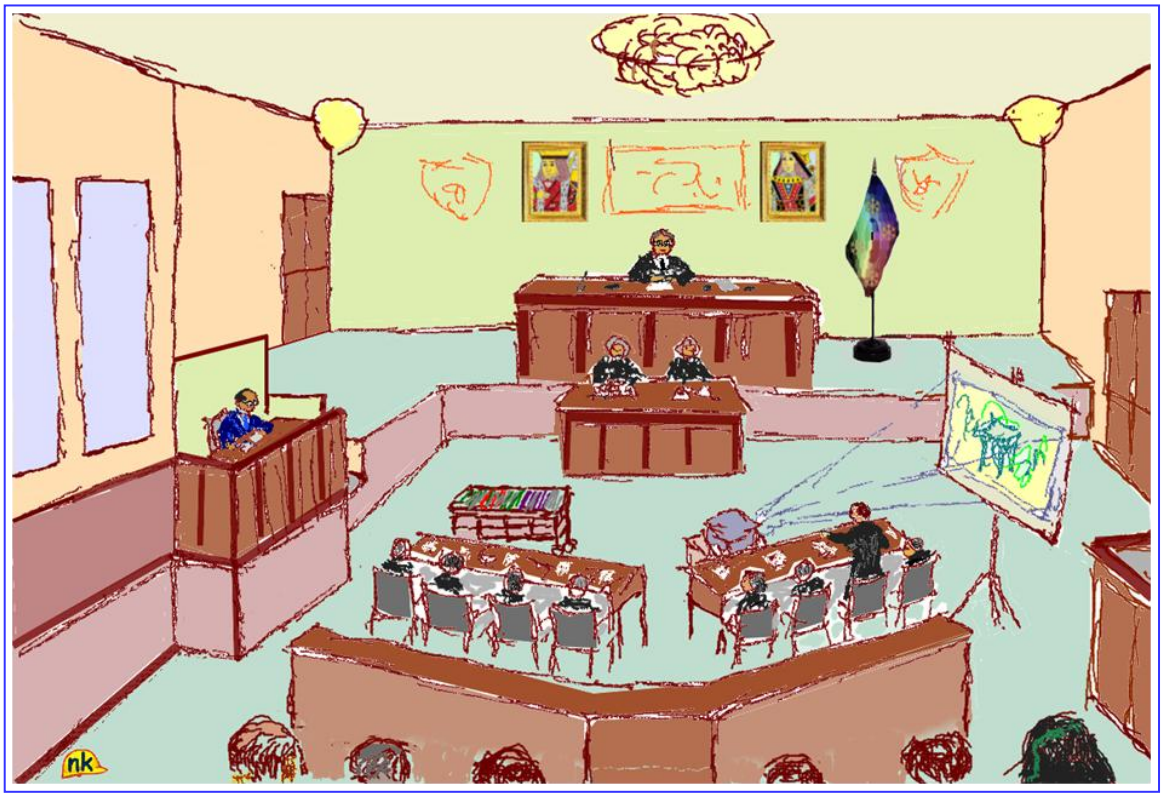

Fig. 1. Typical courtroom for expert witness

Once the judge signals for proceedings to start, the clerk announces the case, and you will be asked to recite the oath to *"Speak the truth, the whole truth, and nothing but the truth".*

You are not taking an examination. It will not be a memory test – quite the contrary, you will have a surfeit of information. You will have all statements made by everybody and all documents connected with the case in a number of fat files on your table. Lawyers will be very helpful in your locating a particular page. If you like, you will be permitted to make brief notes while you are being questioned, to enable you to answer coherently. Beyond this, if you wish to use any fresh material from the stand, it will have to be cleared in advance.

***Personal Experience – 6:***

In a certain case, after I had distributed the handout including printouts of my slides for my next-day's testimony, overnight I inserted one fresh last slide in the belief that it would present a summary of some previous slides and elucidate the point I was trying to get across.

Next morning when I showed it on the screen, there was a rustle of papers from everybody searching for its printout. The judge looked up, and said to me, *"Professor, it is not in my set."* When he found nobody else had either, he continued, *"You are not supposed to show anything without prior approval, please take it off the screen."* Then he told the rest, *"Please disregard this slide,"* and looked back at me and said *"You may proceed."*

I felt a little foolish, but it was not a body blow. I skipped the slide and apologised. Still, a part of me wondered: 'But everybody got to see it, they cannot un-see it!' Of course, no one can repeat that trick consciously, because the system keeps track of such things.

***(6-End)***

**6.3. Acceptance of credentials**

Your acceptability as EW will have to be established in Court before you are allowed to present your testimony. Your WC will be quite gentle and straight with you. But when OC gets his chance, he will

go all out to question your credibility – that is his right, even duty!

Theoretically, the OC may direct questions on your competence only on the five key attributes of an EW listed earlier: Education, training, experience, skill, and knowledge. But OC will manage to squeeze in extraneous and personal matters through crafty questioning.

When you submitted your detailed bio-data and supporting documents, hopefully you would not have selectively left out sensitive items. If you had flunked a course, or if you had been fined for a traffic violation, you should have left it in.

The other side is going to find out anyway, especially in these days of computerised records. It may not affect your expertise for the case (unless it happens to involve your past indiscretion) but leaving it out would raise questions on your motives!

ASCE, [2] lists the common criticisms of an EW's qualifications by OC as follows:

- Experience not strong enough in the particular field of concern;
- Training not adequate in the particular field of concern;
- Training does not encompass all the subjects to be covered;
- Too young to have the experience needed to qualify as an expert;
- Has connection with the case and therefore may have a bias;
- Has overstated his qualifications;
- Is a 'professional witness' [or 'hired gun'] whose opinion may be suspect;
- Works only with one type of client;
- Works only for one side (plaintiff or defendant) all the time;
- Has had an adverse conduct reported to licensing authorities;
- Too academic, has not designed many actual constructed facilities;
- Publications or talks not objective enough for the present case;
- Publications or talks contradict his opinions in the present case;
- Does not have sufficient knowledge of applicable standards;
- Not knowledgeable on recent developments; and/or,
- Has failed to stay informed of changes in practice.

It would be the duty of WC and judge to monitor the fairness and applicability of OC's questions to EW. Since no expert can satisfy all the criteria, the judge will have to permit non-compliance or partial compliance in certain matters as sufficient for the matters on hand.

Naturally, in case too many of the above charges stick, then the EW can be disqualified, or even impeached on a charge of conflict of interest or falsification of credentials.

More often than documented facts, claims of your experience in relation to the case may come up for some juicy questions.

***Personal Experience – 7:***

Just as an example, let us say I am EW for the fall of a tourist. OC asks, *"Professor, before this, how many falls have you investigated of a 60-year old 6 feet tall 200 lb. American lady, from first floor balcony of Hotel Excellent?"* [I exaggerate somewhat, but not much!]

I start *"None, but ..."*, and I am immediately cut short by, *"Please say 'Yes' or 'No'!"*

If I were given a chance to proceed, I might explain that my studies covered detailed study of numerous falls in different countries, both genders, widely ranging in age, height and weight, falling from different heights and from various buildings and environments. But the exact combination of the six variables specified? What are the odds, billions to one?

I thought I would say *"My expertise is on falls from height ..."* and attempt a wise-crack *"I am not an expert on over-weight American ladies"* – but wise-cracks are a 'no-no' from EWs. Who will believe that an engineer can be witty in addition to being expert?

The judge directs the lawyer to rephrase the question. Everybody understands that it was just a rhetorical question to de-stabilise and upset me so that my subsequent responses will be resentful – but I didn't fall for it. To the rephrased query of how I felt competent to testify on this particular case, I responded with what I planned to say, leaving out the joke, of course.

***(7-End)***

***Personal Experience – 8:***

Almost every time I appear in Court, I first get charged with not having relevant qualifications to be an EW in that particular case, and I have to climb back up patiently step by step to the plateau which would be my proper stage for delivering my testimony.

- *"You have spent 40 years in structural engineering, and only 15 years in workplace safety. How can you be an expert in accident investigation?"*
  - I cite my consultancy experience in the USA relating to accident investigations, and my contributions to the topic which confirm my contributions to safety.
- *"All your workplace safety experience is in construction. How can you be an expert in* [say] *shipyards?"*
  - I point out that my expertise and hence my testimony will cover only the topics common to construction and shipyards, such as scaffold safety.

***(8-End)***

**6.4. Technical twists**

Quite frequently, the questioning becomes highly technical. Apart from explaining complex scientific principles in simple terms, you must make sense to the people not in your field.

***Personal Experience – 9:***

In one case, after I had explained my computer structural analysis, the other side argued that I had not included the self-weight or dead load of the structure and hence my analysis was not valid. I was able to explain that my analysis was to point out the other side's error only in the matter of live loads and its influence on the results.

They then claimed it was impractical and unrealistic to omit the self-weight from the analysis. I retorted that most computer matrix and finite element analysis packages actually solved for dead, live and all other loads individually, and then internally took linear combinations of the separate results to get various combined solutions for the actual loadings.

Surely their structure/computer EW knew this?

In fact, I had taught him this as my student!

But, it was their duty to ask – and it was mine to answer, without getting flustered.

After all, I knew. Their EW knew I knew. I knew he knew I knew. No harm done.

***(9-End)***

So, remain within your bounds of expertise. Being tripped up in Court is not pleasant!

OC will find a weak spot, or some past episode to embarrass you with vague innuendo. In particular, he may bring up some setback you may have had in your previous case(s).

It sounds unfair, but as long as you have stuck your neck out, you must take it on the chin! Simply concede the facts, request permission to clarify with more details, or to explain extenuating circumstances that landed you in that situation. But it will all sound a little lame.

To repeat, you as EW are not going to win or lose a case; the only loss you need to be concerned about is weakness or error in the analysis and conclusions of your expert area.

I don't blame OC. It is all in the game. My lawyer will do it too to the other side's EW!

**6.5. General guidelines for testimony**

Some additional guidelines for EW testimony may be listed as below:

- Do not provide interim reports.
- Do not agree to be an advocate for one side or the other.
- Avoid over-simplification and misleading exaggeration.

- Separate opinions from facts.
- Concede indisputable facts even if adverse to client.
- Do not accept assignment without examining relevant documents and reviewing background information.
- Avoid assumptions wherever possible. Try to get information on them.
- Consult other experts or their publications.
- Terminate the agreement if client will not let you proceed in the direction you want.
- Express opinions founded upon adequate knowledge and honest convictions.
- Testify on standards of care only with reference to what prevailed at the time in question, and also not to suit personal preferences.
- Avoid predicting the future.
- Be dispassionate when rendering testimony and during cross-examination.
- Comment on another's work technically, but do not criticise.
- Report unethical or illegal behaviour of any individual or organisation to authorities.

## 7. ANSWERING QUESTIONS

### 7.1. General guidelines for answering questions

Mostly you will be questioned by lawyers; occasionally the judge may ask a question. You should look at the questioner calmly and impassively, not frowning or screwing up your face in concentration or consternation. (Check your facial expressions in front of a mirror!)

When a lawyer asks you a question, you do not answer him directly. Look at the judge, address him as *"Your Honour"* and deliver your answer or comment. If you need repetition of clarification of the question, you may ask OC or WC, addressing him as 'Sir'.

If you are the prosecution or plaintiff's EW, the WC starts the examination first, in the 'Examination-in-Chief', where he takes you through your findings and comments on behalf of your client. If you are EW for the defence, your turn comes second.

When you take the stand, do observe the following guidelines – there are a lot of them:

- If you do not hear a question clearly, ask for it to be repeated.
- If you do not understand the question, ask for it to be rephrased.
- When the question is in many parts, make brief notes of the different parts, and answer them in sequence.
- When question is ambiguous or (from OC) obviously tricky, ask for a clarification.
- Do not answer an unclear question, interpreting it according to your own understanding, because that may not be the original meaning and it may reveal some information to the other side which they did not ask for.
- Believe firmly in your own testimony based on your knowledge and your investigation and findings.
- When the question probes beyond your current knowledge or competency, admit not knowing the answer, or not being able to answer without further investigation, rather than guess from the stand. Say simply, *"I don't know."* Don't add any comments beyond that.
- Keep answers as simple as the context would allow.
- Use drawings or photographs, slides or videos to illustrate your answers – these days courts have excellent opaque, transparency and slide projection facilities.
- Avoid vague or highly jargon-laden answers.
- Answer any question put by OC, unless WC objects and the judge sustains the objection, or the judge himself stops the current line of questioning.
- When OC is aggressive or rude in his questioning, do not get upset or retort or argue. Relax, remain cool – count up to ten – keep looking at the Court with a calm face (no pathos, no martyr look!), and answer briefly and politely.

- If OC persists in straying too far out of line in the questioning too many times, the judge may ask for a meeting of both lawyers in his chambers or at the 'bench' (his table), where he may warn one or both of them to stay within limits.

- When disagreements surface between you and OC, do not argue or start a debate, but back-off with the statement *"No, that is incorrect"*, or *"I strongly disagree"*, retaining cordiality and decorum.
- Never say *"I feel ..."* or *"I guess ..."* – your feelings and guesses are not of interest to the Court. Say *"My opinion is ..."*, or *"I believe ..."*
- Do make notes to later tell WC how to counter OC's charges so that WC can ask you the right questions during his re-examination after cross.
- Again, you should not be concerned about your client winning or losing, but only whether what you said in Court is upheld, left alone, or shot down.
- If your explanation is shown to be wrong, counter it if you can, learn from it when you cannot.

Remember, you are not the accused – what have you to be afraid of? Also, you chose to get into the ring with the other guy – you can't cry about getting punched once in a while!

ASCE, [2] gives the following specific additional suggestions:

- If questioning has strayed beyond point at issue, try to bring back the discussion to the relevant point, focussing on the technicalities and not on the personalities.
- Emphasise the professional unbiased way you went about your analysis, not by reciting your virtues, but listing the procedures to take care of possible bias.
- Make your response in obviously lower key than the question, so the OC will be shown up to be the escalating element and not you.
- Avoid terminating the communication. Go along as long as you need to for the OC to run out of steam, or for the judge to stop the slaughter.
- Don't be cowed into admitting the OC's contention, unless it is true. Be flexible, concede that other viewpoints are possible, but (if you are still convinced of your rightness) reaffirm your opinion, gently but positively.

### 7.2. Take it slow and easy

ASCE, [2] suggests that during questioning, you take your time answering. Listen to the question patiently with attention so you don't miss anything. Ponder over the question and consider possible answers. Frame your choice the best way you can, and deliver it calmly.

***Personal Experience – 10:***

I found I was often answering too quickly. Even during normal WC questioning, I would start to answer before he had completed his question. He would bear with me as best as he could, but tell me during the first break that I should wait until he had finished the question.

But when I cut off the OC's question in a similar fashion, he would look at the judge, turn to me, hold up his hand (which would stop me in mid-sentence) and say: *"But I have not finished my question!"* It made me look foolish. My lawyer got quite upset about it and told me it might affect the outcome if I didn't watch out.

I analysed myself and found that this was a teacher disease : 'I do know the answer, so let me deliver it quickly, without wasting time!' That problem threatened to become a bad habit.

So these days, I wait until the lawyer has completed his question. I let him wait until I count up to, well, say up to five, and then look at the judge and speak my response in measured tones different from the rushed torrent of words I used to deliver earlier.

***(10-End)***

**7.3. Answer to the point**

Answer only to the question asked, and not volunteer information beyond the question as phrased – if the lawyers or the judge want more information, they will ask for it.

***Personal Experience – 11:***

In a case in which I was an EW for the prosecution, a reputed local engineer had just finished his testimony for the defence, explaining how he had checked the scaffold design calculations as per the owner's requirements, and the judge discharged him from the stand.

As he was stepping down from the stand, he smiled at the gathering and said, quite audibly, *"I knew that without bracing the scaffold would fail."*

Prosecution counsel immediately addressed the judge saying, *"Your Honour, may I recall the witness to the stand?"* The judge so ordered, and the engineer took the oath again.

Counsel asked him to repeat the statement that the engineer had made while getting off the stand, and not realising the trap he was falling into, the engineer repeated it.

Counsel: *"If you knew the scaffold would fail without bracing, why didn't you tell them?"*

Engineer: *"Bracing was outside my assignment to check. Moreover, nobody was paying me to ensure the strength of the erected scaffold!"*

It would take too long to describe the aftermath of this bombshell. Suffice it to say that under prevailing rules at the time he could not be connected to the failure. (Now things would be different.) But his not pointing out the potential weakness of the structure fell short of the 'duty of care' he owed his profession – it might have saved the two lives lost in that accident.

He was lucky. He just lost face, and maybe some business. Under some systems, it might have triggered a spate of compensation claims naming the engineer as party to the failure!

I too tended to over-answer when I started – also a professor's disease, answering one-line questions with ten-line answers. That day I too learnt over-answering can be dangerous!

***(11-End)***

You usually answer 'yes' or 'no'; 'that is correct' or 'that is not correct'; 'I agree' or 'I strongly deny it', plus a short sentence before counsel cuts you off. You may continue if:

- WC likes the way you started and gives you a chance to place your comment on record until OC cuts you off; or,
- OC likes the way you started and wants you to dig your own grave, which you nicely do until your lawyer sees the trap and manages to stop you by raising an objection; or,
- Judge likes the way you started and he thinks it will throw more light on the case, and he silences both counsel and asks you to complete whatever you are saying.

Do you see a trap in this? Or do you see it as your chance to enlighten the audience?

It is your choice, and the outcome may decide your (and the case's) fate.

If you get a chance to explain a complex item, keep it short and sweet – let them ask for more if they want. Remember, the judge can stop you cold any time he wants. You are not the keynote speaker at a conference or a minister at an opening ceremony!

**7.4. Keep your cool**

EW is not supposed to get emotional. He is expected to be cool and dispassionate, not a nervous wreck on the one hand or a pompous and arrogant loud-mouth on the other. Some can handle it naturally; some should never be an EW. But many can deliver their stuff with aplomb and dignity with some tutoring and determination (and of course with practice).

That is why the OC will push you to the limit, often until WC and/or judge stop him.

It is important for EW to expect to be pushed thus, and be ready for it. Don't scowl in anger at the OC; don't hang your head down in frustration. At the other extreme, don't smile or grin as if you

are a champ winning a round. Answer simply, briefly, politely, firmly.

The usual trick for the OC is to impute atrocious motives to the EW on the stand, such as *"I suggest that you framed your testimony according to your client's instructions."*

Of course he expects you to get shocked and blurt out some hasty rejoinder, which, while it may not be un-parliamentary or profane, will still show you in a bad light.

***Personal Experience – 12:***

In one case the smiling OC said to me: *"Sir, I put it to you, that you went into this case with the pre-conceived notion that the component was wrongly designed and that is why it failed, and you planned all your analyses and built all your arguments to support that a-priori conclusion, didn't you?"*

With the judge's permission, I explained how I had explored many other alternatives by various scenarios, and only after examining all findings had I concluded that under-design was the reason and not over-loading or poor construction.

Actually the OC's curve ball had helped me to reinforce my testimony!

***(12-End)***

## 8. COURT ETIQUETTE AND DECORUM

In movies and TV serials, heroes and villains alike spill out their emotions and give vent to their feelings while on the stand, making long eloquent speeches. But that is not real life!

### 8.1. Polite and formal

In the U.S., while most testimony is quite polite and disciplined, there are occasional fireworks, by the accused who hurls invectives against the lawyer, or a plaintiff who jumps into the Court 'well' (the space in front of judge's podium), or by a lawyer badgering a witness until he breaks down, or by a client or visitor shouting and throwing things.

But in actual fact and in most countries, including Singapore, courts are quite staid, dignified and decorous, even when the case involves high-level fraud, or low-level sex.

People are usually dressed formally, although blue-collar workers and young rebels come dressed less formally, but warned by their lawyers not to look too outrageous on purpose. If the witness does not speak the local language, or is not sufficiently educated to understand and respond in proper terms, an interpreter is provided to translate back and forth.

The judge has absolute control over the Court proceedings. He can expel anybody at any time if he does not like their attitude or behaviour. The ordinary witness may be allowed some latitude in recognition of his nervousness and lack of familiarity and training about behaviour in Court. But EWs are expected to be well-versed in courtroom etiquette.

Having spent a long time in USA, I knew mild laughter at an unintentionally funny response or a titter at a silly error was often heard, and went by without adverse comment. But in most other courts, frivolity is frowned upon.

***Personal Experience – 13:***

Once, when I was EW in Singapore Court, sitting just behind my lawyer to help him, I was relaxed, too relaxed because my testimony was over. The witness on the stand said something really absurd. In the pin-drop silence that followed before the lawyer rephrased his question, a titter sounded loud and clear, and it came from my throat. Everyone glared at me.

When we came out for a break, my lawyer took me to a corner, fixed me with a baleful stare, and said in a low but unmistakable growl, *"Look Professor, one more sound like that, and one of us will be out of the case!"*

I too looked him in the eyes and said, *"But I was only clearing my sore throat!"* I think he

believed me, but he had the last word: *"Next time, please go out and clear your throat!"*

***(13-End)***

**8.2. Sign language**

To circumvent the rule against coaching the witness during testimony, I have known of (mostly American) lawyers, clients and witnesses developing a sign language of their own beforehand, such as a lawyer leaning back and scratching his nose to mean *"Say 'I cannot recall'."* I am sure many others too would love to put such body language to good use.

Knitting of the brows while concentrating and other natural reactions, and occasional involuntary ticks may be overlooked, but most lawyers and judges know all the other tricks that can be tried in a courtroom – they are mostly a waste of time, and earn reprimands.

So, when you are in Court as EW or part of legal team, don't scratch your head, tug your ear, rest your head on your cupped hands on table, or pensively tap your nose with your pen.

What is also not allowed is for visitors in the media or public areas inside the courtroom to react audibly or visibly to anything going on between the principal actors in the Court.

**8.3. Watch your words**

Everything you say and do inside a courtroom is automatically on record. The only way you can alter any of them later would be to seek the judge's permission and submit a corrected version. But if it involves alteration of previous evidence, it may become a bigger issue, and consequences may range from an admonition to dismissal of the case.

During any break too, EW is not to communicate with his lawyers about the case. Generally the judge will admonish witness against talking to others on the case during breaks.

If you are within talking distance from your team in the corridor or at the urinal, you may trade pleasantries of course. Remember someone from the other side may also be there. But lawyers may (and do) kid each other any chance they get – sorry, but you are not part of it!

So you must be extremely careful to speak to legal team members on your side only when asked, and even then not talk loudly or freely. What you say in the Court premises, or even outside in the presence of witnesses, may be cited and queried in the courtroom by the OC.

**9. ETHICS IN FORENSIC ENGINEERING**

Ethics in forensic engineering is the same as ethics in any other field of engineering, but there are a few issues which are unique to forensic engineering:

- Contingency fee arrangements whereby the engineer stands to receive a higher fee if his client wins is unethical.
- Ethics boards are specially cautioned in investigations of complaints against forensic engineers to eliminate harassment, vendetta, etc. by the losing parties.

ASCE, [2] documents common unethical practices by forensic engineers and EW:

- Exaggerating the influence of one factor in a set to explain some failure without considering alternative explanations, or the contribution of other factors;
- Agreeing to limit the investigation to a very narrow scope which the client and/or lawyer believes will help their case;
- Removal of evidence from, or altering evidence at, the scene;
- Deleting or editing non-supportive information from documents, exhibits, etc.;
- Deleting portions of data from records;
- Showing only selective supporting data in graphics;
- Altering or discarding photographs or videotapes;
- Being purposely vague or ambiguous about ongoing work or in stating opinions; and,

- Withholding relevant material during discovery, such as:
  - Excluding pertinent background or previous experience unless asked;
  - Failure to declare who did the actual work;
  - Wilfully ignoring factual data;
  - Attempting to recant or correct previous testimony when subsequent developments do not fit them; and,
  - Manipulating the resume to make it look better, or to mislead the reader.

Borderline unethical practices include the following:

- Volunteering answers or information beyond the scope of the question;
- Exaggerations, sarcasm, jokes, guffawing;
- Pontificating, giving unnecessarily lengthy answers;
- Criticising another engineer's work;
- Inspecting others' exhibits without their permission;
- Discussing deposition or testimony during break or recess:
  - In the beginning, I wondered about who will know if two people exchange ideas secretly. Here enters the concept of professional ethics (which I happen to teach) which in effect says that the strength of a rule depends on everybody following it faithfully. Hence, for sheer survival of the system, everybody follows the rule, because unethical behaviour can ruin the course of justice.
  - That is why, even accidental exchange of case-related information between lawyers and witnesses during breaks or recesses during deposition or testimony are not covered by attorney-client privilege of confidentiality.
- Arguing or verbally warring with lawyer or judge; and,
- Openly displaying approval or disapproval during other witnesses' testimony.

The lesson to be drawn from such a situation is that an EW must weigh the ethics of all aspects of a case and feel comfortable before accepting an assignment or acting on it.

If it is his misfortune to come up against a less ethical EW, he must have the courage to stand up to the latter, and/or make a complaint to the relevant ethics committee after the case.

Lawyers' ethics also forbids expecting an EW to violate his professional ethics.

***Personal Experience – 14:***

While I was on the stand, I was once asked: *"What do you think of the expertise of Mr. Y* [their EW from abroad]*?"* Mr. Y's resume was indeed formidable, but that was not the point.

I simply replied: *"My professional ethics do not permit me to evaluate the credentials of another EW in the same case."*

***(14-End)***

That is the way it should be between professionals – each doing his job for his side as well and as ethically as possible, but at the same time respecting other professionals.

***Personal Experience – 15:***

At the end of both our EW stints after we had torn each other's testimony apart through our respective lawyers, I went up to the other side's EW, shook hands and said I was happy to make his acquaintance, which I indeed was because I learnt some things from his deposition while I was highlighting for my lawyers where they should tackle him during their cross-examination of him.

He was nice enough to praise my website (which of course, he had browsed through during the previous weekend), and we went on to chat about our experiences with the U.S. Government division for which both of us happened to have consulted at different times.

We didn't of course praise each other's performance on the stand!

***(15-End)***

## 10. CONFLICT OF INTEREST OR BIAS

Conflict of interest for EW can be prior, current, or planned personal or business relationship with one of the parties, an interest in or benefit from the outcome of the case, or anything else that might compromise his impartiality.

The conflict may be:

- *Actual* – certain to affect opinion;
- *Latent* – may have reasonable chance to affect opinion; or
- *Potential* – can be foreseen to cause conflict of interest.

As you do not know all the persons or organisations involved in a case, or which relationship could be a conflict of interest, best thing to do would be to disclose to your lawyers all possible conflicts to the extent you know them, and let the lawyers decide for you.

If and when something else comes up during the case which concerns you on this matter, you may again confer with your lawyers and let them decide for you.

***Personal Experience – 16:***

When I was asked to be EW in a case which involved a quasi-government organisation, I explained to the lawyers that I was at that time a research-consultant to another Government department. The lawyers cleared me to go ahead, and I duly informed my research sponsor.

I have also refused cases where I found I might be facing other clients in my consultancy, albeit from another agency, across the aisle in the case.

However, I could not avoid facing opposite me, some of my former students (who by now had risen to quite high positions, about which I could be justifiably proud). In one case, the EW and one of the defendants on the other side had been my students. Their EW did not have a problem because he and I knew we were experts and not litigants – although he had not seen me in action as EW yet! Of course he helped his side to punch holes in my arguments!

The defendant however was embarrassed to let me see him in such an awkward position, I guess. The first day we met in the Court corridor, he greeted me with a shy smile and a *"How are you, Professor."* As the heat of testimony rose, he simply sat in Court, avoiding my eyes.

It turned out that finally the case against him and his two co-defendants was dismissed. He had no further problem meeting my eye.

On the other hand, a well acquainted co-member of a professional society who got tripped up through my investigation, stopped speaking to me. That is all part of the game.

***(16-End)***

Bias, according to ASCE, [2] is an *"inability or unwillingness to consider alternative approaches or interpretations."* Bias is misplaced sympathy which might sway one's judgement. The charge of bias in an investigation can be eliminated or minimized by using more than one method to analyze the data and to test the validity of the possible scenarios.

The possible consequences of proof of conflict of interest and bias can be many and serious, such as termination of services by the client, denial by the Court to testify, dismissal of the client's case by the Court, and disciplinary action up to and including suspension or even removal of P.E. license.

## 11. MISTAKES BY EXPERT WITNESS

Mistakes may happen with any EW; this will damage his testimony to a varying degree.

Alternatively, while yours is one explanation for the accident, the other side may come up with another equally good or even better explanation which fits the facts; this will weaken your testimony.

The magnitude of the mistake and its consequences to the parties on the two sides may become

primary factors in the disposition of the case. Another factor would be whether you find the mistake yourself or the other side finds it. Either way, it is a blow to your side's case.

The legal aspects of mistakes by EW are very complex, and highly dependent on the legal system and many other circumstances. For instance, in certain States, EWs have immunity against mistakes and their consequences. USA abolished blanket EW immunity in 2001.

Charges may cover perjury, contempt of court, malpractice, negligence, etc. Outcomes may include declaration of mistrial, claims for damages, fines and imprisonment, fresh litigation, etc. Consult a legal expert in forensic engineering for guidance in this matter.

**11.1. Common mistakes by Expert Witnesses**

A general summary of common mistakes sourced from various authors [7, 8, 9, 10, 11] is given below. Many of them have been identified in earlier sections of this paper also. It is a long list, not arranged in any particular order, but try to avoid them all like poison!

***(a) Accepting a case:***

- Preparing different CVs for different clients.
- Accepting rush cases that do not permit the engineer to follow his standard protocol.
- Accepting low-budget cases. [Except *Pro-bono*, i.e. as free social service.]

***(b) Preparing for investigation:***

- Failing to adequately document their investigation and findings.
- Failing to ask for and review the complete set of records.
- Not corroborating facts provided by counsel.
- Simply reviewing attorney's deposition summaries instead of reading the deposition.
- Relying on data or documents not pertinent to the date on which the lawsuit event occurred.
- Refusing to acknowledge the implication of possible bias resulting from prior employment (i.e., pensions, friendships with career co-workers, post-employment contracts, clients derived from prior employment).

***(c) Relationship with attorneys:***

- Neglecting to tell your attorney about related prior testimony, affidavits, speeches or publications, job assignments or lawsuits even if remotely relevant.
- Failing to reveal "resume blemishes" to your attorney (failures in school, convictions, drug or alcohol problems, job 'lay-offs', conflicts of interest, prior accidents, license suspensions, etc.).
- Not providing your attorney cross-examination questions for use on opposing expert.
- Not ensuring counsel understands the investigation and the findings thoroughly.
- Ignoring the opposing lawyers' and experts' view of the case.
- Misunderstanding how your opinion fits into client's or attorney's theory of the case.

***(d) Conducting the investigation:***

- Forgetting that you are an advocate only for your own opinions and your methodology, but not for opinions happening to favour your client.
- Failing to master the facts of the particular case in which you are employed.
- Mishandling custody of tangible evidence.

***(e) Writing the report:***

- Writing reports that are based on incomplete investigations and insufficient data.
- Writing a report without being asked by counsel.
- Putting too much in writing, too soon, and too casually.

- Not writing a report according to civil procedure rules, if any.
- Sharing draft reports with counsel.

***(f) Behaviour on the stand:***

- Sounding too much like an 'expert', that is, talking down to the Court.
- Offering opinions outside your area of expertise.
- Allowing your 'ego' to intrude in your deposition or trial testimony.
- Damaging your credibility by quibbling over peripheral issues when on the stand.
- Losing your temper on the stand – except for restrained righteous indignation.
- Answering hypothetical questions without asking the cross-examiner to supply all the variables or assumptions.
- Answering questions in deposition or trial, without understanding the question.
- Losing sight of the fact that juries and judges pay a lot of attention to choice of words.

***(g) Fee discussion and billing:***

- Billing for work not authorized by the attorney and client or analysis which satisfies intellectual curiosity but is not necessary for the case.
- Revealing arrogance when discussing how much you are being paid to testify.

Professional consequences and management of technical mistakes are another matter, to be dealt with by one's peers.

**11.2. Who discovers the mistake matters**

If the other side finds a major mistake in your work, it would be disastrous to your side.

If you find the mistake yourself, first inform your lawyers. Analyse the error, do whatever you can to correct it, determine what other findings, conclusions, and recommendations the error and correction would impact, and as soon as possible submit a report detailing the mistake, correction, and its consequences, formally to the Court through your lawyer.

If the mistake affects only your side, your client and lawyer may decide to soften its impact. You may accommodate them to a certain extent, but do not let it become a cover-up.

First off, a cover-up would be cheating the system, defrauding society. Professionally, it would be highly unethical. Finally, it would be extremely illegal, punishable under law.

Discovery of the error may not be that far-fetched. The other side expert already has (or can subpoena) EW's data, and can re-do the analysis; then the error will certainly show up.

The mistake itself is bad enough. Cover-up would make it much, much worse. EW's career would be over. As a respectable member of society, he would be finished for life. His family and his friends would have to face the stigma forever. It is certainly not worth it!

Naturally, it would be very embarrassing to have to confess to a mistake. The plus point here is that you caught it yourself and took the initiative to rectify the error. Of course you will lose some credibility, but people will understand and respect you for facing it boldly.

Actually, being gracious in defeat would score some points for you in other testimony where you are right.

**11.3. Management of mistakes**

Whether it is an outright mistake or dilution of opinion, you must accept the error or the change. Don't let your loyalty to your client, or guilt at taking his money, or resentment at being found wrong, affect your response in this matter.

- Blustering, arguing, making excuses, joking about it, blaming other people or faulty equipment (with computer as usual scapegoat) is a cop-out, hallmark of a bad loser.
- If there is any explanation of the error in your favour, do bring it out, but do not 'gild the lily'

or try to slide out from under. It will only make you look worse.

- Put on a calm face and with some humility, concede the inevitable truth: You were wrong, or the other side is equally right.

Trivial, inconsequential mistakes in your report or Court presentation that would not have any impact on the deliberations in Court or on technical or legal outcomes, may lead only to embarrassment, and correction of record. Revised documentation and apology would suffice.

***Personal Experience – 17:***

In a recent case, after the preliminaries, when the OC went over my many graphical analyses picture by picture, he pointed two of them which were identical. Sure enough, there they were, for all to see in their copies, and no way could I deny it.

Luckily, I could identify the problem right away: I had two items in one picture, and I had intended to use the same picture twice, once for each item, but had ended up marking both items on the same picture and printing it twice. I thought I had checked everything many times before I handed my report to the lawyers, but obviously I had missed this one item.

While somewhat embarrassing, once I explained and apologised for my oversight, everybody understood, and the point was dropped. Still, I reprinted that page in the report overnight with the two pictures correctly marked and first thing next morning my lawyer handed copies to all parties, while I delivered another apology with a smile.

***(17-End)***

If the mistake is in EW's investigation or in findings, the problem is bigger. Even here, if consequences are localised and limited to broad conclusions, and does not extend to primary conclusions and framing of charges addressed by the EW, the damage can be contained.

***Personal Experience – 18:***

Once, I discovered that I had misread a number from voluminous computer output, and had declared the other side's design as [say] *"deplorably inadequate"*. They objected to my use of 'deplorable', and asked for more quantitative details for my qualitative assessment.

I had no way of reacting on the spot. Fortunately, it happened about half an hour before end of day, and I requested adjournment through my lawyer.

It was while I was checking documents on why I had said 'deplorable' that I discovered my error. I managed to check the effects of the corrected value on my findings.

I drafted a succinct and honest reply explaining the circumstances of my oversight, setting down how the correction led to my revised opinion (– up to 'barely adequate' from 'deplorably inadequate') and affirming that it did not affect my other findings or recommendations.

Next morning, copies of my reply were distributed to all the parties. With the Court's permission, I summarised in simple, unvarnished language what was in the revised document, apologised for this unintentional error and sat down.

Of course, I lost some ground, but I was very lucky it did not damage the case!

***(18-End)***

**11.4. Consequences of mistakes**

Bigger mistakes will have disproportionately bad consequences for the side with mistake.

If the mistake is so bad that it blows your client's case to the skies, or gives ammunition to the other side, that will be really disastrous. Maybe your side can appeal with a corrected analysis – and possibly look for a smarter EW! You will lose some or a lot of future business.

Once one mistake surfaces, other side will naturally suspect there could be others, and would want re-confirmations from your side, and also have their experts verify your claims.

Apart from the legal consequences (which cannot be detailed here), the professional fallout of a

serious mistake on EW would be quite bad. EW's P.E. license will be suspended, and his membership in professional societies may be cancelled. He may not be EW anymore.

The consequences of mistakes are vastly different from the viewpoint of the engineer and the law. To engineers, it is clear if in a scaffold collapse case, the designer has been shown to have used the wrong formula or the contractor has been proved to have omitted braces, they deserve to be penalised proportionate to the contribution of their mistake to the collapse.

But the law takes a different view. First the causality has to be proved 'beyond reasonable doubt'. Most engineers would condemn the use of wrong formulas or omission of braces, but in Court it has to be proved with unshakable evidence that it was the wrong formula or the omission of braces that caused the failure. Next, factors like negligence – meaning the professional committed the mistakes with knowledge and intent – must be demonstrated,

Further – and this I learnt the hard way – the error must be shown to have violated some Code or regulation in existence, or at least to have been contrary to good standard practice in that particular industry or trade, at the time and in the region the accident took place.

Otherwise, the most a Court could do would be to warn the proven wrong-doers to be more careful in their professional 'duty of care'. Defendants or accused would go scot-free. Hopefully, their 'near-death' experience would make them wiser, and society would be better off, even without punishment. I have referred to some examples in another paper, [3].

## 12. DEALING WITH THE MEDIA

All Court investigations of accidents are very public affairs, with rare exceptions like when rape victims, particularly minors, are examined *in camera* meaning isolated from the public.

Often, it is not EW who is focus of publicity but the high profile case with wide public exposure, or if victim, plaintiff or defendant is a high official, TV star, or notorious gangster!

The point is that the media must have its huge headlines to flaunt about the case, interesting stills or videos to display from it, and/or sound bites to quote from one of the players in it. Simply put, the case must sell the paper, or draw TV and radio audiences.

Incidentally, the EW will often come in for some unavoidable media attention.

Newspapers and radio/video commentators have to dramatise the issue. They may not misquote, but some of your words may be placed out of context, and displayed in a headline, and this may raise eyebrows if not some anger!

Use of journalese may give the reader a wrong impression not intended by the person attributed to and not admitted by the reporter. For instance, acquisition of information from the Internet may be cited as having been 'lifted' from the web!

Once the media have their say or show, you don't have a chance to clean up your act in the same media, so you just have to accept it as your *karma* (fate), good or bad.

Don't blame them; they too are exercising their right, and doing their duty.

***Personal Experience –19:***

In a case where the accident victim attracted wide local attention, I as EW fell target to media interest. Morning papers covering my first day's testimony had headlines featuring a phrase which I had used in my testimony, accompanied by my picture. I wondered if that was really the way I meant my professional opinion to sound, (Figure 2, left.)

After second day's testimony, just when our legal team was about to exit the Court house doors, my lawyer straightened my tie, and said: *"Prof, the paparazzi* (that is, media reporters) *are out there with video cameras. Smile at them, walk briskly, but don't say anything!"*

LAWSUIT OVER ACCIDENT

# International safety standards? 'No such thing'

therefore couldn't have met global standards, says witness

could not possibly have met international safety standards, an expert witness testified yesterday.

This is because there are no set standards to meet, Professor Natarajan Krishnamurthy told the court. Instead, they differ from country to country.

But during cross-examination by defence lawyer it emerged that Prof. Krishnamurthy did not take the photos but had lifted them from the Internet.

he could measure the number of pixels in between the two points. He divided this by the height measured in pixels. Finally, he multiplied the figure by the

Prof Krishnamurthy, a trained civil engineer, took the stand yesterday in the lawsuit against

Fig. 2. Newspaper and TV coverage of author's testimony

I said, *"Aren't you coming?"* My lawyer said, *"Nah, you are the handsome one"*, and added more seriously, *"We are here every day, and they know we won't tell them anything."*
Nor would I, but the reporters might not know that. So, although I was dog tired, I put on a smile and walked right past them, even waving away a question, and a couple of videographers followed me all the way to the taxi pick-up.

Two or three TV channels showed me smiling and walking for about ten seconds, while the voice-over explained that Professor Krishnamurthy was the EW for the plaintiff, blah-blah-blah. I don't know what the viewers got out of it, but many people recognised me from that – and I guess have forgotten me when the next, more handsome – or more high-profile – person came along! (Figure 2, right.)

***(19-End)***

The general rule for EW with media is, better keep your mouth shut. It is for the client or his counsel to announce your apppintment as EW, and the scope of the work assigned to you, and also share any comments on the progress of the case. Even when the client or counsel encourage or approve your talking to the media, you must clearly understand how far they want you to go.

Publication of the EW's work in a magazine or technical journal can be considered only after all the appeals have been exhausted and the case has been closed, and even then, if identification details are to be included, only with the permission of the client.

These days, blogs are the worst to stomach. Because of the ease of access and the anonymity of their origin, blogs are where immature minds can spill out their innermost fears and prejudices. There could be some serious comments and a few rare bouquets.

One blog called me a meddling old man who does not know how to use computers wasting a court's time with his fancy fantasies.

You just read and ignore them, that is all.

## 13. COURT REPORTING

In the old days, the best a Court reporter could do was to take short hand and transcribe it later into regular typed text. Then came, at least in the West and advanced counries, the stenotype machine, which had a few keys with which the stenographer recorded the depositions and testimonies phonetically and then typed them longhand, (Figure 3.)

Once electronics entered the game, there were huge changes in the recording modes, with speech recognition and speech-to-text transscribers, which will do almost everything a stenographer used to do, requiring only a little bit of final syntactical editing, with investment of a fraction of the effort and a miniscule amount of time.

But pictures have not advanced to the same extent text has. Photography (still and video) is not yet allowed in most courts, as already noted. Court may record all proceedings in audio and video for its own internal use and archiving, under strict protection of confidentiality.


Fig. 3. How Court reporters record the proceedings

## 14. THE FEE STRUCTURE

How much do you charge as forensic consultant or EW? I will just give my opinion.

Whatever the market will stand, is one answer. If you are famous, sky is the limit!

But professional ethics will impose constraints such as:

- Not hiking up the rates depending on the distress of the client;
- Not collecting fees from two parties for the same job; and
- Not accepting contingency fees by which EW gets more if his side wins and less if it loses.

Generally, accident investigation rates are one and a half to twice normal consultancy rates; Court appearances for taking the stand can be two to three times the normal rate; Court attendance to assist the lawyers may be halfway between the previous two.

So, if a consultant engineer charges $100 an hour normally, he can charge $150 an hour for investigation, up to $200 an hour if site visit, lab work, or out-of-town travel is involved. He may charge $250 an hour for taking the stand, and $200 an hour for advising lawyers.

Of course the rate may go up by another 50-100% if it is a very complex or 'risky' case involving sophisticated expertise, and/or if you are known as one who delivers the goods consistently and who can stand up to a barrage on the stand with aplomb.

## 15. LAWYERS' ATTITUDES

How about the feuding lawyers who appear to be sout to get each other's blood through the poor witnesses on the stand? Outside the Court they will be so nice to each other you wonder if they are the same people you saw inside fighting like cats and dogs (politely, of course!). Although I have not discussed this with lawyers, I guess they may have their own loves and hates, admirations and jealousies, but nothing is overt or intense.

I compare them not to Ali and Liston fighting it out in the boxing ring, but to the Williams sisters Serena and Venus, battling it out on the singles tennis court – surely each would be fighting to win, regardless of the affection and the admiration they feel for each other! On court, no quarters given or asked. Off court, back to family life, give and take.

Unlike a doctor or an engineer, when a lawyer represents people who have been wronged, another lawyer necessarily represents the wrong-doer – even if only because the Court assigns him. In many cases the line between the wronged and the wrong-doer may be blurred.

An accused may admit to his lawyer any legal violation, but the lawyer cannot convey it to the authorities (or anyone else) under the attorney-client privilege. Instead he would have to defend the accused to his utmost in Court, to get him off the hook.

Even when more evidence comes in against the accused, the lawyer still has to try to get the sentence reduced due to 'extenuating circumstances'. I guess it is like actors who become famous for their villain roles – the test of quality being only *"Did he do a villain act well?"*

In the West, especially in USA, it is common for lawyers at some stage in cases where the trends are fairly clear, to confer with clients and decide what lesser charge they could plead guilty to and accept the smaller sentence, rather than take a gamble and end up with a much heavier sentence. Then the defence lawyer meets up with the other side and offers a deal. The other side may also have concerns on how much longer it will take or whether they can make their charge hold up till the end. Both sides will negotiate hard until some common ground is found and then approach the judge with their compromise.

In practice, all lawyers are very polite, even pleasant, to witnesses and clients from both sides. But let there be no misunderstanding: Each lawyer is there (paid or *pro-bono*) to quash the other's case, by destroying testimony of the other's witnesses, EWs being prime game.

Some OCs may make it clear from start that they are on the other side of the fence from you by completely ignoring you.

Other OCs may act aggressive with you while you are on the stand, but once the judge has retired to his chambers, become very friendly, even chatty. You may have to be careful with your responses to these overtures though, not relaxing your guard, and not talking about the case matters.

Most OCs however keep to the minimum courtesies, with a slight smile or nod when your eyes meet, but otherwise leave the other side witnesses well enough alone.

Yet, lawyers can be quite nice sometimes – even to the other side!

***Personal Experience – 20:***

In a case when I took the stand for a cross-examination on 30th October, I was surprised when OC opened his cross by facing the judge and saying with a smile: *"Your Honour, I think it would be proper for us all to wish the Professor a Happy Birthday yesterday!"*

Judge nods, everybody in Court applauds – a rare departure from the rigid daily combative format. I don't think they do it for every witness.

I get up, take a bow and sit down again. I know that I should get ready to battle the OC soon! Yet, I am incredibly moved.

***(20-End)***

## 16. CONCLUSION

To quote Ratay again, [1]: *"Expert consulting/witnessing is a challenging, demanding, lucrative area of professional engineering practice. Not everyone is 'cut out' for this work, and not everyone wants to operate in the usually adversarial environment."*

Forensic engineering is somewhat akin to a medical speciality like neuro-surgery. It is very satisfying, but very stressful. The pressures of being an EW are indeed high. The hazards of failure and consequences from failure are often not worth the risk.

Each time I take the stand as EW and the pressure builds up, I tell myself I should not accept another assignment. But after the case is over I look back and invariably feel good about what little I may have accomplished for someone or some group.

Then, I am ready for the next case that comes along – if I like it!

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