

2.0 PROFESSIONALISATION.

Engineering Profession:

Who is an Engineering Practitioner?

The Council for the Regulation of Engineering in Nigeria registers:

- (i) Engineers
- (ii) Engineering Technologists
- (iii) Engineering Technicians
- (iv) Engineering Craftsmen
- (v) Engineering Consultants

The great liability of the engineer compared to men of other professions is that his works are out in open where all can see them. His acts, step-by-step, are in hard substance. He cannot bury his mistakes in the grave like the doctors. He cannot argue them into thin air and blame the judge like the lawyers. He cannot, like the architects, cover his failures with trees and vines. He cannot, like the politicians screen his short-comings by blaming his opponents and hope the people will forget. The engineer simply cannot deny he did it. If his works do not work, he is damned... On the other hand, unlike the doctor, his is not a life among the weak. Unlike the soldier, destruction is not his purpose. Unlike the lawyer, quarrels are not his daily bread. To the engineer falls the job of clothing the bare bones of science with life, comfort, and hope. (Fredrich 1989:546)

It is generally agreed that there are a number of characteristics which distinguish a profession from other less formally constituted trades and occupations:

- (i) The professional discipline has a command of a specialized body of knowledge necessary for planning, design, construction and operation of physical structures, engines/machines.
- (ii) The body of knowledge is transmitted through recognized training and regularly updated on behalf of the professional body to ensure certified standards of proficiency.
- (iii) A code of Ethics and Standards govern the practice of the profession and ensure the satisfaction and safety of the client in particular and the society in general.
- (iv) A monopoly is usually granted to a professional body by society through laws to ensure that only registered members can engage in the professional practice.
- (v) The members are committed to constant educational renewal through a lifelong learning of latest technology and professional development.
- (vi) The professional body is legally to regulate itself, discipline its members and control the practice of the profession.

It is said that the quality of a person's life is in direct proportion to their commitment to excellence regardless of their chosen field of endeavor (Vince Lombardi).

Professionalism is therefore about commitment to standards of excellence in the performance of tasks which require specialized skills and expertise. A professional is thus someone whose basic satisfaction is in performing well, tasks for which he has

been trained and always strives to achieve the best standard possible in any circumstance. To be a professional is thus to flaunt the highest levels of the skills one professes to command. The Nigerian Society of Engineers in organizing courses for her members is encouraging continuing professional development of its membership.

2.2. FUNDAMENTAL CODE OF ETHICS.

The professional engineer has some authority which has to be exercised carefully to avoid being a source of danger to the public. This includes being a leader in engineering projects, practicing engineering and supervising the work of younger engineers. The basic rules that govern the conduct of engineers (Engineering Ethics) are summarized into [14]:

- (i) Hold paramount the safety, health and welfare of the public.
- (ii) Perform services only in areas of their competence.
- (iii) Issue public statements only in an objective and truthful manner.
- (iv) Act for your employers as faithful agents or trustees.
- (v) Avoid deceptive acts.
- (vi) Conduct themselves in such a way as to always enhance the reputation of the profession.

2.3 ENGINEERS' RESPONSIBILITY FOR PUBLIC SAFETY.

Recent incidences in the US such as the Challenger space-ship disaster, the Kansas city Hyatt – Regency hotel walkway collapse and the Exxon Ospill have drawn attention to the Engineers' responsibility for public safety. Safety is a social and not primarily a legal obligation. Engineers and their managers must keep their obligations to public safety at the forefront when making design and management decisions.

Quality designs and construction practice are imperative in every field of engineering. There is need for ethical and creative engineering designs and corporate practice. The American Society of Civil

Engineering Code of Ethics states that “Engineers must hold the public safety, welfare, and health paramount and use our knowledge and skill for the enhancement of human welfare”.

When Engineers take pride in and responsibility for their designs, the entire engineering profession benefits.

Consideration of professional ethics in engineering practice positively affects engineering creativity. If ignored, bad public relations are a possibility for the engineer, the company he works for and the profession in general. Engineers should strictly adhere to their professional codes and standards. They should encourage others to report those who do not. They should do so because:

- (i) It will help protect people from being injured by what the engineers do.
- (ii) It will assure each engineer of a better working environment and reduce pressures from other people to do otherwise.
- (iii) They will be proud of their profession if they adhere to the codes of ethics, especially in Nigeria where the public image of engineers need improvement.
- (iv) Adhering to the codes will lead to benefits for all engineers and public confidence in the profession will be increased.

Safety is an essential design consideration. Safety is deemed as the absence of unreasonable danger. Sometimes, a factor safety of 2-3 is built into engineering design equations. Despite this, litigations associated with engineering failures are on the increase, and in some countries

practicing as a professional has become a risky venture. The Engineers and their professional societies must acquire requisite knowledge about liability issues. The question is often asked, “where does a design engineer and his companies responsibility end and the contractors, manufacturers and consumer’s begin?.” It is pertinent to end this section on Engineers responsibility for public safety with a quotation from the Ethics case studies published by the Texas A & M department of philosophy and mechanical Engineering: “The public has provided Engineers, through the tax base, with the means of obtaining education, and through legislation, with the means of licensing and regulating themselves. In return, engineers have responsibility for protecting the safety and wellbeing of the public in all of their design efforts. This is part of an implicit social contract all engineers agree to when they accept admission to an engineering college (membership of NSE)”.

2.4 CONFLICTING INTERESTS AND CONFLICT OF INTEREST.

Engineers should be careful in getting involved in taking “decisions” which may be seen as biased or having conflicting interests or conflict of interest.

The examples below indicate conflict of interests which can influence the judgment of an engineer.

- (a) An engineer has responsibility to write specifications for a water project but owns a company that manufactures and sells such systems. This constitutes a conflict of interest.
- (b) An Engineer works for a local government agency and at the same time works for a consulting firm that deals with the agency.
- (c) Engineering decisions that are to the advantage of Engineers taking the decision constitute conflicting interests.
- (d) A company pays for engineers to attend a seminar on the use of its products. This is compared to perks and gifts given to physicians by drug companies.
- (e) An Engineer’s interests may be at conflict with those of its clients.
- (f) An Engineer leaving public employment and then working in the same area in the private sector is a delicate issue. The engineer has had access to government activities that a private client may desire. Can this be ethical?
- (g) A city engineer selects an engineering firm for a city project based on its technical proposals. However other firms view the selection of the firm as biased.
- (h) A client believes an engineer’s design are too costly but the engineer fears that anything less may endanger public safety.
- (i) An Engineer has a conflict between honoring an agreement with a former employer and reporting a hazard to protect public interest.
- (j) An Engineer owns both a contracting firm and a consulting firm and seeks to provide both services for a client.

2.5. ENGINEER’S PROFESSIONAL OBLIGATIONS.

Engineers shall commit themselves to achieving the highest standards in their work so as to increase the reputation of their profession. To achieve this they shall:

- Act consistently in public interest
- Act In the best interest of their client and employer and consistent with public interest
- Their product meet the highest professional standards possible
- Maintain the integrity of their professional judgment
- Promote an ethical approach to design and development

- Advance the integrity and reputation of the profession consistent with public interest
- Should be fair to and supportive of their colleagues
- Committed to lifelong learning and professional development
- Shall promote an ethical approach to professional practice.

Thus the engineer has various obligations which are further expatiated for emphasis

2.5.1 OBLIGATIONS TO THE PUBLIC

Engineers shall act consistently in public interest by;

1. Accepting full responsibility for their own work.
2. Act as moderators of the interests of the employer, the client and the users in the best Interest of the public good.
3. Accept designs and proposals only if they are safe, meet specifications and do not diminish quality of life or harm the environment.
4. Disclose to appropriate bodies, any potential danger to the user, public or the environment that may be associated with a proposal or design.
5. Cooperate in any efforts to address such matters of grave public concern that may arise from his engineering proposal or design.
6. An engineer should avoid deception in all public statements concerning his proposal, methods and tools.
7. Should always volunteer professional skills and contribute to public education in the discipline.

2.5.2 OBLIGATIONS TO CLIENTS AND EMPLOYER

Engineers should always act in a manner that is in the best interest of their employers and clients, consistence with public interest. As appropriate, they should;

1. Provide service only in their area of competence and should be honest in any limitations of their experience and education.
2. Should not knowingly use designs that are obtained illegally or unethically.
3. Should use the property of his client or employer only in authorized manner or with their consent.
4. Maintain confidentiality of any information gained in the professional work where such is in the public interest and consistent with the law.
5. Report to client or employer promptly, if a project is likely to fail, prove too expensive, violate intellectual property law or otherwise be problematic.
6. Accept no outside work detrimental to the work being performed for the primary employer.
7. Inform client or employer or appropriate authority when a higher ethical concern is being compromised.

2.5.3 OBLIGATIONS TO MANAGEMENT

Engineering projects managers and leaders should ensure and promote ethical approach to development and execution of engineering projects and shall as appropriate:

1. Ensure good management and effective procedures for promotion of quality and standards and reduction of associated risks.
2. Ensure that information on standards are available to engineers on a project.
3. Assign responsibility to engineers after considering appropriate contributions of education and experience tempered with potential for further education and experience.

4. Ensure realistic and quantitative bills of quantities, scheduling, and outcomes on the project and provide an uncertainty assessments of the estimates.
5. Provide full and accurate conditions of service to prospective engineers for employment on the project.
6. Offer fair and just remuneration to employees on the project.
7. Provide for due process in hearing charges of violation of an employer's policy or of this code.
8. Should not punish any engineer for expressing ethical concerns on a project.

2.5.4 OBLIGATIONS TO PROFESSIONAL COLLEAGUES:

Engineers should be fair and supportive of their professional colleagues. They should as appropriate:

1. Encourage colleagues to strictly adhere to the code.
2. Should be committed to assisting colleagues in their professional development.
3. Always credit fully the work of others and refrain from taking undue credit.
4. Should always give a fair hearing to the opinions, concerns or complains of other colleagues.
5. Engineers in situations outside their area of competence, call on the opinions of other professionals who have competence in that area.

2.5.5 OBLIGATIONS TO SELF:

Engineers should be committed to lifelong learning promote an ethical approach to the practice of their profession. They shall also endeavour to:

1. Continually improve their knowledge in the analysis, design, specifications, maintenance, development and testing of the systems of interest together with the management of the development process.
2. Improve the quality of the output of the engineering projects they are associated with.
3. Improve their ability to produce accurate and informative documentation of the projects.
4. Improve their knowledge of relevant professional standards and laws governing the contracts.

2.6 CONTINOUS PROFESSIONAL DEVELOPMENT AND COMMITMENT TO EXCELLENCE.

Today, Engineers can level mountains to the ground and turn rivers from their courses. The skies and the oceans are media for a wide range of engineering activities. Various categories of modern transportation and communication systems have turned the world into a global village. Electric Energy has catalyzed civilization and environmental development. No matter the area of human challenge, the engineers are the agents of change and innovation through well thought out engineering projects.

In the light of the above, the engineer must be engaged in continuous professional development to maintain competence and advance the existing frontiers of knowledge in their areas of practice. (He who adds not to his learning diminishes it—Talmond Tabloid), the engineer should provide subordinates, the opportunities for professional development. Professionalism is also about commitment to standards of excellence in the performance of tasks in ones field of expertise. The engineer's obligations include commitments to professional development, the

determination to always achieve a high standard of excellence and consistently ensuring a sound judgment in decision making.

2.6.1 Obligations to the Profession:

Engineers should always work to advance the integrity and reputation of the profession consistent with public interest. Engineers should as appropriate:

1. Provide public knowledge of the profession and an environment that encourages ethical practice of engineering.
2. Should not promote their own interest at the expense of the profession, client or employer.
3. Ensure professional standards except when inconsistent with public interest
4. Should always avoid false statements and those that could be considered speculative, vacuous, deceptive, misleading or doubtful
5. Engineers should ensure that clients, employers and supervisors know of their commitment to the professional code of ethics and the implications of such commitment.

2.6.2 COMMITMENT TO EXCELLENCE

Engineers shall ensure that their final output meet the highest professional standards possible.

1. Aim to achieve high quality and acceptable cost, irrespective of tradeoffs. Such tradeoffs should be clear to and accepted by the client and employer
2. Identify and address ethical, economic, legal and environmental issues related to the projects.
3. Engineers should ensure that they have the requisite qualifications, by appropriate combination of education, training and experience, for the project they accept to execute.
4. Ensure that their output meet the highest professional standards and should not depart from such standards unless when ethically or technically justified.
5. Understand clearly the specifications for projects they undertake.
6. Ensure realistic estimates of cost, scheduling, quality and outcomes on any project and provide uncertainty assessment of their estimates
7. Engineers should ensure adequate documentation, including problems encountered and solutions adopted for any project executed.

2.6.3 NEED FOR SOUND JUDGEMENT

Engineers shall maintain integrity and independence in their professional judgment. They should as appropriate:

1. Only endorse documents prepared under their supervision or within their areas of competence and with which they are in agreement.
2. Maintain professional objectivity with engineering documents they are asked to evaluate.
3. Should not engage in corrupt practices such as bribery, double or inflated billing, or other improper financial practices.
4. Disclose to all parties concerned, those conflicts of interest that cannot be avoided in the project

5. Should refuse to participate in any project in which they, their employers or clients have undisclosed conflicts of interest.

2.7 PROFESSIONAL CONDUCT AND MISCONDUCT:

Engineering ethics is beginning to take its place alongside other well established professional groups such as Medical, Nursing, Business and Legal ethics. These professions have websites on the conduct/ misconduct of their members.

Most establishments have unwritten codes of conduct for their staff whilst others spell out what should be regarded as misconduct. Since “To engineer is human” the Nigerian Society of Engineers is beginning to receive complaints on Engineers’ misconduct. The University of Lagos senior staff conditions of service defines misconduct as “General misconduct to the prejudice of the good name of the establishment and/or of discipline and the proper administration of business of the University. This includes corruption, dishonesty, drunkenness in the course of duty, and false claims against the University, insubordination, divided loyalty (conflict of interest) , negligence, falsification and suppression of records (facts, professional information) and conviction for a criminal offence other than traffic offence, absence from duty without leave for two consecutive or more nights without satisfactory reason, disobedience of any instruction issued by a constituted authority, failure to appear or to answer questions satisfactorily in any investigative panels set up by the establishment on matters out of above regulations.

A search on the internet shows that cases of misconduct are not as rampant in engineering discipline as in other professions. Engineers are taught to be familiar with codes and standards for their disciplines and to introduce a reasonable factor of safety in their designs. They are also expected to collaborate with the local standards enforcement agency such as the Standards Organization of Nigeria. However, neglect of professional ethics and inadequate enforcement of codes and standards are the causes of the few engineering failures in Nigeria.

In academics, plagiarism is a serious offence. It is interesting that some complaints on plagiarism have been received by the Nigerian Society of Engineers. All Engineers have responsibility to build a good image for the society and should always be conscious of the impact of their actions on the public image of their professions.

A search for our world’s worst engineering failures/disasters would cover collapse of buildings and other structures, natural disasters such as earthquakes and oil spills. Some of the well documented failures include:

- i. Columbia space shuttle/challenger space-ship disaster
- ii. Failure of supersonic aircraft concord
- iii. Bhopal chemical leak which claimed 2000 lives
- iv. Collapse of Bridges from wind damage
- v. Chernobyl Nuclear power plant explosion and fire
- vi. Exxon Valdez oil spill, Alaska 1989, 10million gallons spilled
- vii. Kansas city, Missouri Hyatt Regency Hotel Failure

When failures occur, engineers should provide an analysis report by considering the ethical issues that might have been partly responsible for the failures. This should include information on what failed, why it failed, possible ways of preventing such failures and who was at fault.

2.8 ENGINEERING FAILURES

Although the engineer's efforts at creating and building systems to meet some need are expected to be "fail proof" but since the engineer is human, failures do occur. Engineering systems also fail over time as a result of aging, material fatigue or wear and tear. The engineer must design to avoid failure which could result in loss of life and property or damage to the environment. A combination of factors lead to system or equipment failures. These include human factors, design flaws, material fatigues, and extreme conditions of operation and environmental factors. Often, neglect of engineering ethics is a root cause of an engineering failure. An ethical engineer is one who:

- i. Avoids conflict of interest
- ii. Does not attempt to misrepresent his knowledge and experience so as to accept jobs outside his area of expertise.
- iii. Acts in the best interest of society and environment
- iv. Fulfills the terms of their contract in a professional manner
- v. Promotes the education of young engineers within the field.

A search for our world's worst engineering failures/disasters would cover collapse of buildings and other structures, natural disasters such as earthquakes and oil spills. Some of the well documented failures include:

- i. Columbia space shuttle/challenger space-ship disaster
- ii. Failure of supersonic aircraft concord
- iii. Bhopal chemical leak which claimed 2000 lives
- iv. Collapse of Bridges from wind damage
- v. Chernobyl Nuclear power plant explosion and fire
- vi. Exxon Valdez oil spill, Alaska 1989, 10million gallons spilled
- vii. Kansas city, Missouri Hyatt Regency Hotel Failure

When failures occur, engineers should provide an analysis report by considering the ethical issues that might have been partly responsible for the failures. This should include information on what failed, why it failed, possible ways of preventing such failures and who was at fault.

2.9 LOCAL ENGINEERING FAILURES AND ARBITRATION

The investigation, Failures and Analysis Committee (IFAC) of the Nigerian Society of Engineers has the responsibility to visit every site of engineering failure, accident or complaint so as to ascertain the cause of such development. This is necessary to ensure that such occurrence is prevented in future and to reduce the danger to the public arising from activities of engineers. Appendix one shows a list of some of the collapsed buildings, structures, and Bomb and fire disasters in the country in recent times. One may re-call reported collapsed buildings that are not in this list.

There were about ten cases of collapsed buildings in Lagos in the first half of 2003. This prompted the then president of NSE, Engr. Somolu to write to the Executive Governor of the state to take measures to reduce such incidents.

He suggested that appropriate authorities concerned with construction and supervision of public buildings should ensure that:

1. Approval of all drawings, structural, electrical and mechanical should be done by only registered engineers.

2. Supervision of building projects should be done at various stages of construction by qualified professionals and approvals obtained for each stage before the project is continued to completion.

After the bomb blast at Ikeja cantonment Armory, of January 2003, the President of NSE proposed an NSE team of experts to professionally evaluate the immediate and future effects of the serious explosions on the buildings, bridges and other infrastructural facilities in Lagos. This was seen as a contribution to the state and the entire nation. Records did not show that the project was executed. The NSE should be able to sponsor such studies which can be useful for the development of the engineering profession. The explosions would have provided the Mining Division of NSE, who sometimes deals with explosives, to investigate the standards for storage of such lethal weapons, and why the disaster occurred.

The fact that thousands of Nigerians lost their lives would have led to more serious investigations of the disaster by the NSE.

An examination of the list of local disasters, failures and accidents in Appendix 1 shows that no serious technical data arose from the visits of IFAC to the sites. Samples of the explosives that caused the explosion at Idumagbo were not obtained by NSE for analysis. It is possible that Lagos state authorities may not have considered the necessary standards for safe storage of such materials. It is clear that more effort is necessary to ensure that IFAC is providing data that will assist the NSE to protect public interest through its activities. It is recommended that IFAC should be assisted to be more effective in its investigation of structural failures and other disasters in the country.

- IFAC should provide more detailed reports on structural failures in the country. The causes of the failures should be documented.
- Information on actions taken by relevant authorities to prevent a repetition of such failures should be compiled.
- IFAC and all the committees of NSE should be adequately funded by the society to ensure that they can carry out any investigations, provide reports and hold seminars on activities of engineers that affect public safety.

It is noted that NSE records have not shown, any case of an engineer being investigated or sanctioned for inadequate design or unprofessional activity that led to a structural failure or building collapse. It was noted in some cases of building collapse that the owners did not use professionals for the design and construction of the buildings and even approved drawings were not available. The current effort by the institute of town planners in conjunction with five other professional bodies to develop a "National Building Code" should lead to some improvement in the procedure of commencing and supervising a building project and improving that it is adequately completed and ready for the purpose it is designed.

Engineers, by the code of ethics, are committed to ensuring that the incidence of failed engineering projects are reduced to a minimum.

2.10 GROUP DISCUSSIONS ON ETHICAL ISSUES

- Moral concepts and theories.
- Basic canons of engineering ethics.
- Ethics and professionalism in Engineering.
- Organizational loyalty and professional rights.
- Engineers and the environment.

- Risk and the Engineering decision making process
- Negligence and the professional “Debate” over responsibility for design.
- Literature on “whistle blowing”-An Overview.
- Engineering Design: Literature on social responsibility versus legal liability.
- Accepting gifts and amenities.
- Conflicts of interest.
- Causes of identified structural failures in the country.
- Actions taken or otherwise after specified building failures in the country.

2.11 CASE STUDIES IN ENGINEERING ETHICS.

The IFAC of the NSE has provided reports on the various building failures in the country. This course gives engineers the opportunity to evaluate the reports and the actions taken by relevant authorities.

In order to ensure the mistakes inherent in reported failures are not repeated, case studies of some local and foreign engineering failures are summarized in this section.

- (i) The Aberdeen Three: In 1989, three engineers working on developing chemical weapons at a US army facility, the Aberdeen proving Ground in Maryland, were indicted for a criminal felony. They were tried and convicted of illegally handling, storing and disposing of hazardous waste in violation of the Resource Conservation and recovery act form 1983-1986. This case shows the importance of the engineering profession’s social and environmental responsibilities, in both legal and moral terms. In addition, it serves as an important case study in the escalating public concern over environmental and toxic waste, and the ways in which government is called upon to regulate engineering business. Aberdeen Three is particularly useful for students of environmental engineering; however, it also is a useful case for showing engineering students the irresponsibility to the public at large.
- (ii) Kansas City, Missouri Hyatt Regency Hotel Walkways Collapse: As the United States most devastating structural failure, in terms of loss of life and injuries, the Kansas City Hyatt Regency walkways collapse left 114 dead and in excess of 200 injured. In addition, millions of dollars in costs resulted from the collapse, and thousands of lives were adversely affected, all because of disputed conversations between the engineering design firm and a fabricator, and negligence on the part of the contracting engineering firm. The case provides a vivid example of the importance of accuracy and detail in engineering design and shop drawings (particularly regarding revisions), and the costly consequences of negligence in this realm. The case is particularly useful in structural design, statics and materials classes.
- (iii) Accepting Gifts and Amenities: Mostly engineers probably believe that accepting small favors (such as inexpensive pens) from vendors is permissible. By contrast, most engineers probably believe that accepting large gifts or amenities is wrong. Drawing the line between permissible and impermissible instances of accepting gifts and amenities is not always easy, however. This case invites students to think about the issues involved in such decisions. It is particularly suitable for senior-level engineering courses.

2.12 SUITE OF CODES OF CONDUCT AND ETHICS.

- (1) Codes of Environmental Ethics for Engineers (see Appendix B).
- (2) NSE code for Engineering conduct (see Appendix C).
- (3) Engineers code of conduct (see Appendix D)
- (4) IEEE code of ethics (see Appendix E).

2.13 CODE OF ENVIRONMENTAL ETHICS FOR ENGINEERS.

The WFEO COMMITTEE ON ENGINEERING AND ENVIRONMENT, with a strong and clear belief that man's enjoyment and permanence on this planet will depend on the care and protection he provides to the environment, states the following principles:

2.14 TO ALL ENGINEERS.

When you develop any professional activity:

1. Try with the best of your ability, courage, enthusiasm and dedication to obtain a superior technical achievement, which all contribute to and promote a healthy and agreeable surrounding for all men, in open spaces as well as indoors.
2. Strive to accomplish the beneficial objectives of your work with the lowest possible consumption of raw materials and energy and the lowest production of wastes and any kind of pollution.
3. Discuss in particular the consequences of your proposals and actions, direct and indirect, immediate or long term, upon the health of people, social equity and the local system of values.
4. Study thoroughly the environment that will be affected, assess all the impacts that may arise in the state, dynamics and aesthetics of the ecosystem involved, urbanized or natural, as well as in the pertinent socio-economic systems, and select the best alternative for an environmentally sound and sustain-able development.
5. Promote a clear understanding of the actions required to restore and, if possible, to improve the environment that may be disturbed, and include them in your proposals.
6. Reject any kind of commitment that involves unfair damages for human surroundings and nature, and negotiate the best possible social and political solution.
7. Be aware that the principle of Eco systemic interdependence, diversity maintenance, resource recovery and inter-relational harmony form the bases of our continued existence and that each of those bases poses a threshold of sustainability that should not be exceeded.

Always remember that war, greed, misery, and ignorance, plus natural disasters and human induced pollution and destruction of resources, are the main causes of the progressive impairment of the environment and that you, as an active member of the engineering profession, deeply involved in the promotion of development, must use your talent, knowledge and imagination to assist society in removing those evils and improving the quality of life for all people.

2.15 NSE CODE OF ENINEERING CONDUCT.

Every member is expected in his general conduct to uphold and enhance the honor and dignity of the Engineering profession and the reputation of the NIGERIAN SOCIETY OF ENGINEERS and to act always in the public interest.

- (i) A member shall make available his professional knowledge and experience in accordance with this code as a consultant or adviser, or a salaried employee, or a teacher of Engineering science, or in de-sign, or manufacture, or construction as a faithful agent and trustee of his client, employer, or other people concerned with the works.
- (ii) A member shall not practice in a dual capacity as a consultant and as a contractor for the same project except with the prior written consent of the client.

(iii) It shall be concerned unprofessional and inconsistent with honorable and dignified conduct and contrary to the public interest for any member of the Nigerian society of Engineers:

- (a) To exert undue influence or to offer, solicit or accept compensation for the purpose of affecting negotiations for an engineering engagement.
 - (b) To use the advantages of a salaried position to compete unfairly with other Engineers.
 - (c) To accept remuneration for services rendered other than from his client or his employer
 - (d) To attempt to supplant another engineer in a particular engagement after definite step have been taken towards his employment.
 - (e) To review the work of another engineer for the same client except with the knowledge of such engineer, unless such engineer's engagement on the work which is subject to review has been terminated.
 - (f) To attempt to injure, falsely or maliciously, the professional reputation, business, or employment position of another engineer.
- (iv) A member shall not place orders on his own behalf in respect of a project in which he is engaged but shall only do so explicitly on behalf of his client
- (v) A member shall not be the medium of payments made on his clients behalf unless especially so requested in writing by his client, but shall only issue certificates for payment.
 - (vi) A member shall not take part in a competition involving the submission of proposals and designs for engineering work unless an assessor who shall be an engineer of acknowledged standing has been appointed of whom all such proposals and designs are to be submitted for adjudication.
 - (vii) A member shall not invite or submit priced proposals under conditions that constitute price competition for professional services.
 - (viii) A member shall not advertise engineering services in self-laudatory language or in any other manner derogatory to the dignity of the profession.
 - (ix) On engineering works in a foreign country the member may adapt his conduct according to the professional standards and customs of that country, but shall adhere as closely as practicable to the principles of this code.

2.16 COREN ENGINEERS CODE OF CONDUCT

1. REGISTERED CODE OF CONDUCT.

A Registered Engineer may be engaged in research, in production, in supervision of construction, in management of engineering concern or as designer, or he may be retained as a consultant for professional advice, inspection, certification or adjudication, or be engaged in any combination of these. In discharging these responsibilities, a registered engineer shall uphold and enhance the honor and dignity of the engineering profession and shall at all times act in strictly judicial manner as a faithful agent or trustee of his client or as official arbiter between the contractor and the client. He shall act with full regard to the codes of practice of the professional society, association or institution to which belongs and in accordance with the rules laid down in this Code of conduct.

A registered Engineer when trusted with the finances of his client or Employer must let his honesty of purpose be above suspicion. When he acts as a professional adviser, he must let advice be absolutely disinterested. When he is charged with the exercise of judicial function between Owner and Contractor, he must act with entire impartiality and above all, he must at all times be conscious of the moral responsibility of his profession, his associates and his subordinates, and he must be fully conscious that the profession carries with it, great responsibility to the public.

2. RULES OF CONDUCT:

2A. Responsibility of a Registered Engineer to the Profession.

1. A registered engineer shall not knowingly take part in a competition involving the submission of proposals and designs for engineering work unless an assessor who shall be an engineer of acknowledged standing has been appointed, to whom all such proposals and designs are to be submitted for adjudication.

2. A registered engineer should satisfy himself to the best of his ability that the enterprises with which he becomes identified are to legitimate character.

If, after associated with an enterprise in good faith, he finds it to be of questionable character, he should sever his connection with it as soon as possible.

3. A registered engineer should not engaged in the practice of making preliminary studies and estimates of costs for proposed projects or render other professional service or advice without adequate compensation.

4. A registered engineer shall not advertise engineering services in any language or manner derogatory to the dignity of the professional.

5. A registered engineer shall not, either himself for through any person or firm, offer to make payment, by way of commission or otherwise, for the introduction of employment.

6. It shall be the duty of every registered engineer to bring to the attention of council any violation of this code of conduct and to endeavour to encourage other registered engineers to adhere to its provisions.

2B. Relation among Registered Engineers.

1. A Registered Engineer shall not act so as to injure or attempt to injure, whether directly or indirectly, the professional reputation, prospects or business of another registered engineer provided that this rule shall not be taken as prohibiting him from expressing technical opinion on behalf of his client before a tribunal or in a commissioned report, or from lodging the complaint of the conduct of another registered engineer to the competent body.

2. A registered engineer shall not, directly or in directly, attempt to supplant another registered engineer, nor shall he intervene or attempt to intervene in or in connection with engineering work of any kind which to his knowledge has already been entrusted to another registered engineer.

3. A registered engineer shall not review or take over work of another registered engineer acting as a consulting engineer for the same client, until he has either obtained the consent of such registered engineer, or has been notified by the client in writing that the connection of such registered engineer with the work has been terminated, and in either case, his reports and advice shall be confined to the particular matters upon which he has been consulted.

4. A registered engineer shall not accept engagement while the just claim for compensation or damages, or both, of another registered engineer previously employed on the same project and

whose employment has been terminated, remains unsatisfied or until such claim has been referred to arbitration or issue has been joined at law, unless the registered engineer previously employed has neglected to press his claim legally after a reasonable time.

5. It is improper for a registered engineer to attempt to secure engagement by reducing his usual charges for professional service after being informed of the charges named by a competitor.

6. It shall be considered unprofessional and inconsistent with honorable and dignified conduct and contrary to the public interest for any registered engineer to use the advantages of a salaried position to compete unfairly with other registered engineers.

7. It is the duty of the registered engineer to ensure that credit for work and ideas are attributed only to the real authors.

2C. Relation between a Registered Engineer and his employer or client.

1. A registered engineer shall not be a director or a salaried employee of any company, firm or person carrying on any commercial, contracting or manufacturing business, which is or may be involved in the class of work to which his appointment relates, nor have any substantial financial interest in, nor be an agent for any such company, firm or person without disclosing the fact to the client in writing.

2. A registered engineer shall not place orders in his own behalf in respect of a project on which he is engaged but shall only do so explicitly on behalf of his client.

3. A registered engineer shall not be the medium of payments made on his client's behalf unless especially so requested in writing by his client, but shall only issue certificates for payment.

4. Unless authorized by the owner, a registered engineer shall not receive directly or indirectly any royalty, gratuity or commission on any patented or protected article or process used in connection with work upon which he is retained by the owner nor shall he accept without the owner's consent any trade commissions, discounts, allowances, indirect profits or other secondary considerations in connection with any professional service which he undertakes for the owner.

5. A registered engineer shall discharge his duties to his employer with complete fidelity and shall accept remuneration only from his client unless he has his client's authority in writing to do otherwise

6. A registered engineer shall make available his professional knowledge and experience at all times and in accordance with this code as a consultant, or adviser, or salaried employer, or teacher of engineering science, or in design, or manufacture, or construction as a faithful agent and trustee of his client, employer, or other people connected with the work.

2D. Responsibility of an Engineer as an employer.

1. It is the duty of a registered engineer as an employer to ensure that no person in his employment other than a registered engineer holds any post, discharges or purports to discharge any function that is properly that of an engineer.

2. A registered engineer employing the services of any person working or training to become a registered engineer, shall ensure that such a person is given every opportunity to satisfy the

conditions to enable him earn satisfactory certificate of experience and shall not improperly withhold the issue of such a certificate when required to do so.

2E. Responsibility of a Registered Engineer to the public.

1. A registered engineer in discharging his responsibility to his employer and to his profession, shall have full regard to the public interest.
2. A registered engineer shall maintain dignified interest in the welfare of the community and shall endeavour to assist the public to arrive at a correct general understanding of the technical phases of issues of public interest. He shall discourage and challenge untrue, unfair and exaggerated statements on technical subjects, especially when such statements lead to unworthy or uneconomic public enterprises.
3. A registered engineer shall accept personally his responsibility as a citizen, assumed his share of gratuitous public work for the general good, support public officials in the enforcement of technical regulations, and take an active interest in the formulation and improvement of such regulations.
4. Public appreciation of the profession will be increased by the advancement of the technical sciences.
A registered engineer shall therefore promote such advancement by his own efforts and by his encouragement of sound technical training and research.
5. In addition to the safeguards directed by him, a registered engineer shall recognize his broader obligation to provide amply for the safety, health, and comfort of the public in whatever field his services may be required.
6. A registered engineer, when working in a country other than his own shall order his conduct according to these rules, so far as they are applicable, but where there are recognized standards of professional conduct, he shall adhere to them.
7. A registered engineer who shall be convicted by a competent tribunal of a criminal offence which in the opinion of the disciplinary body renders him unfit to be a member of his professional society, association or institution, shall be deemed to have been guilty of improper conduct.

2F. RESPONSIBILITY OF THE REGISTERED ENGINEER REGARDING CONTRACTS.

1. A registered engineer shall see that every position which he considers necessary to protect the interest of owner, engineer, contractor, or the public is incorporated in the contract.
2. A registered engineer shall ensure that fairness and honor shall govern the use of every bid over which he is to adjudicate. The contract shall be awarded on the basis of the original bids except when substantial change is made in the work, or when further bidding on alternate items is requested. Any reduction of a bid disproportionate to such change constitutes unfair competition.
3. A registered engineer shall ensure that a bid received from a contractor, whether in open competition or privately, should not be used to secure lower prices from competitors, nor shall competitive bids be rejected for the purpose of using the information derived from them as a means of securing lower bids from those who competed or from others. After the acceptance of a bid, any alteration which would have materially changed the bidding or awards shall be avoided.
4. A registered engineer shall not call for unnecessary of full estimates from prospective bidders on tentative projects, and if he calls upon a contractor for preliminary estimates or appraisals, the registered engineer shall see that the contractor is paid for the service.

2G. IEEE CODE OF ETHICS

WE, THE MEMBERS OF THE IEEE, in recognition of the importance of our technologies in affecting the quality of life throughout the world and in accepting a personal obligation to our profession, its members and the communities we serve, do hereby commit ourselves to the highest ethical and professional conduct and agree:

1. to accept responsibility in making decisions consistent with the safety, health and welfare of the public, and to disclose promptly factors that might endanger the public or the environment;
2. to avoid real or perceived conflicts of interest whenever possible, and to disclose them to affected parties when they do exist;
3. to be honest and realistic in stating claims or estimates based on available data;
4. to reject bribery in all its forms;
5. to improve the understanding of technology, its appropriate application, and potential consequences;
6. to maintain and improve our technical competence and to undertake technological tasks for others only if qualified by training or experience, or after full disclosure of pertinent limitations;
7. to seek, accept, and offer honest criticism of technical work, to acknowledge and correct errors, and to credit properly the contributions of others;
8. to treat fairly all persons regardless of such factors as race, religion, gender, disability, age, or national origin.
9. to avoid injuring others, their property, reputation, or employment by false or malicious action;
10. to assist colleagues and co-workers in their professional development and to support them in following this code of ethics.