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An Effective Strategy for Enforcing Ethics Compliance amongst Engineering Industries in the Developing World

Both governments and professional engineering societies in the developing nations have made several codes of ethics for their engineering industries. But there are little indications that these codes are fully complied with. The consequence of poor compliance has been a tremendous negative effect on humans and the environment. The need to enforce the application of these ethics is therefore necessary. A two way solution is suggested. An internal approach that will require the industries to set up and supervise an ethics compliance program induced by way of government legislation; and an external approach that will require the government to setup an active task force supported with an active involvement of professional societies to setup their own watchdog and ethics compliance scheme for the industries.

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1. Introduction

The earth we live is changing tremendously. The end may not be palatable judging from the point of view of the kind of change that we notice. Climate change for instance has become a worrisome issue with increase flooding almost all over the world, intense precipitation, heavy storm, heat waves, excessive heat even in regions that were hitherto fairly temperate, and several other unusual weather conditions. Also noticeable is the increase in natural disasters and human induced disasters like collapsed buildings and dams, structural failures in aircraft, bridges, radio mast/tower, and so on. A host of unethical engineering practices have been identified as a cause to this change.

The latest data from the US Energy Information Administration [1] reveals that the world total CO₂ emission in 2011 is estimated to about 32,578.645 million metric tonnes which is 3.4% rise from the previous year. The figure is quite

significant compared to that in the 1960s and reveals the impending danger ahead if drastic measures are not taken. The trend however is not expected to rescind since leading countries in green gas pollution like China and India (with about 26.8% and 5.3% of world total emission respectively in 2011) have not shown sign of decrease in their emission rate. United States which is the second leading country (after China) in green emission with about 16.9% of the world's emission in 2011 showed a drop of about 2.3% in her emission rate from 2010 to 2011. Future data will however show how much they can sustain this trend. In the Middle East, leading countries in CO₂ emission like Iran and Saudi Arabia are seen to be increasing their emission profile with about 10.7% and 9.6% rise in their emission rate from 2010 to 2011 respectively. The rise in emission rate has been linked with economic growth, rising industrialization and energy consumption[2]. This therefore suggests a leading role of engineering industries in green gas pollution.

Structural failures like building collapse have also been on the increase in recent time, with three separate incidences in Bangladesh[3], India [4] and Tanzania [5] reported this year. The eight-storey Rana Plaza collapse in Bangladeshi capital, Dhaka, appeared to be the worst case ever with about 1,127 people confirmed dead and the building reduced to rubble. While the case may still be under investigation, preliminary findings have shown that weak structure, negligence and improper safety or preventive measures are the immediate causes. More so, the collapse of the Kutai Kartanegara Bridge in Indonesia, on 26 November 2011 [6] and the collapse of the Karachi bridge in Pakistan [7] on 2nd September, 2007 are some examples of structural failures reported in the recent past which have caused unnecessary loss of lives and properties.

Unethical engineering practices have been identified as a major cause of these human induced disasters. Notable politicians, scientist and policy makers have even argued, for instance, that "climate change is fundamentally an ethical issue" [8] and should therefore be addressed from that perspective. In addition, disasters like structural failures have been linked with cases of gross engineering misconduct that bothers on non-adherence to safety procedures, incompetence, and misapplication of professional engineering among others.

In this paper, a methodology for supervising and enforcing ethics compliance for engineering industries is proposed in order to provide safety to the people and the environment. It proceeds with a discussion of the causes of non-compliance by industries, a discussion on some of the ethic crises and then the proposed methodology. Generally, the methodology suggested is classified under two approaches: external and internal. The internal approach will require the engineering industries to set up and maintain a supervised ethics compliance program with a dedicated ethics department and officer in place while the external approach will require the governments to set up a task force with aggressive government legislation and a comprehensive ethics compliance strategy to supervise and report on engineering industries. The external approach will also

require the professional organization to set up their ethics watchdog and a compliance strategy to ensure ethical practices in the engineering industries.

These suggestions are however not restricted to the developing nations. They can equally be applied to other countries of the world. A global and collective resolve is what is required to slow the tides of climate change and prevent the rising human induced disasters.

2. Causes of non-compliance

There can be several reasons for non-compliance of engineering industries to ethical standards in their workplace and also for misconduct on the part of engineers. Reviewing these causes may be a good step to planning an ethics compliance program. The following are some of the reasons and justifications that have been identified [9, 10].

a. The need to meet goals in crucial times

In trying to meet deadlines some of the industries usually resort to unethical misconduct justifying their actions on the superiority of the objective goal. This action may in reality affect the safety of the people and the environment

b. The need to maximize profit

In trying to maximize the company's profit and maintain the profit margin some engineering firm may resort to the use of substandard materials or even harmful materials for production. These usually have severe impact on the people's lives and the environment.

c. Strong competitors

The presence of a strong competitor may cause many engineering industries to begin to cut corners to stay afloat. Piracy may begin to set in, and excessive collection of loan which may eventually ruin the company.

d. Tough economic reality

Difficult economic reality may also lead to unethical practices by the industries. They may also engage in excessive borrowing at the expense of the real capital, marketing of substandard products to save cost and a host of other non-professional ethical practices.

e. Employers pressure

2.1 Ethics problems

A host of ethics problems confront engineering industries and practicing engineers in their workplace. They range from individual misconduct to company non-compliance with ethical standards. Identifying these problems also may be a good step to providing possible solutions. Below are highlights of some of the problems that have been identified [11].

- Company and individuals having questionable credentials

- Unethical employer's request
- Marketing of fake or substandard products
- Piracy
- Product installation that does not meet specification
- Wrong testing procedures of product or items
- Flaring of gasses and oil spillage
- Unethical behavior in awarding and executing contracts
- Savings and loan scandals
- Practicing nonprofessionals
- Expertise misrepresentation
- Fraud
- Breaking security and contract law
- Bribery

3. Methodology

3.1. Internal approach

The internal approach to enforcing a supervised application of codes of ethics in the engineering industries will require a legislation that will mandate the industries to set up their own ethics and compliance program with effective control and compliance procedures. This will involve the establishment of an ethics department as well as instituting an ethics officer as practiced by some corporate bodies in the United States [10]. It will require an ethic training and orientation scheme as well as adopting a code of engineering ethics if none is already in use. Furthermore, it will be required to institute whistle blowers, institute a yearly employee performance reward given on the basis of ethics compliance and create an ethics reporting website as well as the provision of a hotline manned by external contractors for reporting on employer and employee ethical compliance as well as environmental impact of the company. The goal of this is to internalize the enforcement of ethics compliance so that it translates to a general compliance to provide safety to the environment and people. This can be understood from the popular saying that charity begins at home. The following is a summary of the proposed internal approach.

- a. Creation of an ethic department with an ethics higher officer
- b. Ethics training and orientation of both management and staff
- c. Adopting a code of ethics if none exist already
- d. Whistle blower
- e. Employee performance appraisal on ethics compliance basis
- f. Creation of an ethics reporting website and a hotline

Ethics department and ethics higher officer(s)

Creating an ethics department and designating an ethics higher officer will be necessary to institutionalize the importance and awareness of ethics-compliance for all management and staff of the industry. The officers will be responsible for monitoring of behavior and performance to ensure ethics compliance by staff, for communicating ethics standards effectively, for organizing ethics training, for formulating performance evaluation criteria, and for filing periodic ethics compliance report to organizational management, to government and professional bodies [10].

Ethics training

Ethics training will be required annually for all new staff or stale members of staff as well as for managements. This will give all members the knowledge of the basic principles of engineering ethics, create ethics awareness compliance standard, provide them the requisite knowledge to resolve ethics dilemmas and conflicts, provide them scenarios and ample case study to learn from, instill the consciousness for environmental and peoples protection through ethical decision making, and empower them with risk management strategy vis-à-vis ethics compliance.

Code of Ethics

This will be required for all engineering firms especially for those yet to adopt one. It will serves as a reference point for ethical conduct and decision making for both staff and managements. This can normally be adopted from professional bodies or government agencies.

Whistle blower

This will be required and will serve as a watchdog or an alarm system for the industry. Members of staff and management will be particularly careful in their ethical conduct and decision making because of the possibility of being reported or publicized.

Performance appraisal

A performance reward on the basis of ethical conduct will be most required as both management and staff will compete for common good. Weber & Wasieleski [10] reported some performance criteria used by some corporate bodies in the US to include ethical values such as "honesty", "integrity" and "accountability"; and performance activities such as "good team spirit", "role modeling", "promoting safety", etc.

Website and Hotline

These will be required to provide a good reporting medium for not only members of staff but equally for clients and external community people. These media can be operated on a 24 hours basis with easy access and manned especially by an external agent. The reports can be made available to appropriate quarters. Those made on the website should be posted without the identity of the

reporters. The rights of staff should generally be protected vis-à-vis any claim on ethics ground.

3.2. External approach

The external approach which is suggested to maintain an atmosphere of control and supervision for the application of codes of ethics by engineering industries will require combined government legislation for the creation of an ethics task force, followed by an aggressive government legislation, and an active involvement of the professional bodies in the supervision and control process to ensure ethical compliance of engineering industries.

Government Ethics Task Force

A task force will be necessary for ethics compliance supervision. The task force can be composed of professional engineers, experts, and environmental protection agents; and should be given the mandate to supervise industries, conduct safety and health audit of the industries[9], enforce the implementation of code of ethics and compliance procedures, work with law enforcement agents to prescribe punishment and enforce compliance, provide incentives through government legislation to engineering companies for implementation of ethics compliance scheme, should regulate licensing procedure for industries, and should report and publicize cases of non-compliance. The mandate can be summarized in the following way:

- a. Enforcement of ethics codes and compliance procedure
- b. Conduct safety and health audit
- c. Provide Incentives
- d. Regulation of licensing procedure
- e. Report and publicize cases

Supervision and Enforcement of ethics codes & compliance procedure

The task force will be required to prescribe to all the industries to adopt ethics code and to set up compliance scheme. They should conduct periodic supervision on the industries to ensure their compliance with the ethics procedure, and work with the ethics relation officer in the various industries for monitoring and for record keeping. They should emphasize protection for any officer who prefers to maintain its integrity while confronted with an ethics dilemma. They should also have the mandate to interrogate employee and get information about the industries ethics compliance, misconduct and the individual's ethics dilemmas. And above all they should work with the legislators and law enforcement agents to prescribe penalty and to punish offenders.

Conduct safety and health audit

The ethics task force should have the mandate to carryout periodic unbiased assessment of industries in regards to their safety and health compliance. They

should be required to work with the environmental protection agency and experts to assess industries' environmental pollution rate, employee exposures to harmful particles, and the state of their facilities.

Incentives

In this case they should use the arm of government to make legislation that will ensure that the industries are well furnished with incentives to develop and sustain the ethics compliance program. This will no doubt serve as a motivation and driving force for the whole scheme.

Regulation of the licensing procedure

This will require a general re-interpretation of industries' state licensing procedures as suggested by Farrar [9] to include the elements of compliance with ethical standards, acceptance for the establishment of ethics compliance program to include an ethics officer, and the legal implication of non-compliance.

Reporting and Publicity

It will be most required for the ethics task force to make public all the cases of misconduct and non-compliance from the industries. This will serve as a positive deterrent for many industries to act appropriately as no industry will want to lose their public ranking and clients.

Aggressive Government Legislation

It will be required for the government to support the task force with tough government legislations and time responsive policies to meet with the challenge of enforcement and supervision. The Industries will most likely succumb to government's pressure to act according to ethical standards.

Professional Bodies

The professional societies will no doubt prove invaluable to enforcing and sustaining ethics compliance program in the engineering industries. They should among several of their roles set up their own task force to conduct periodic survey on their members, set up an ethics disciplinary tribunal just like the one instituted by Puerto Rico State Society of Professional Engineers and Land Surveyors [12], distribute codes periodically to old and new members, and maintain an active ethics website and hotline.

Professional Societies' ethics task force

The professional bodies should be required to setup their own task force to carry out periodic assessment on the level of conformity of their members with ethics standards. They may conduct risk assessment and staff performance appraisal with respect to the ethics criteria. This will be required to ensure and maintain integrity of their profession and to bring about safety to the people and the environment.

Ethics disciplinary tribunal

It may also be required for them to have an ethics disciplinary tribunal to try suspected members on their level of compliance with ethics standard or nonchalant corporate members on their ethics compliance procedures. Punishment may range from suspension to expulsion and prosecution. This will strongly emphasize the importance of ethics compliance and create an atmosphere of care on the part of the engineering firms.

Professional Societies' ethics website and active hotline

The professional bodies should be required to include an ethics page on their website to allow for easy reporting of misconducts and sending of petitions. Should also resuscitate their ethics helpline to allow for a 24hours service for reporting ethics misconducts, dilemmas etc. The identity of callers should be protected and the body should have regulations that protect any member that chooses to protect his integrity when confronted with an ethics dilemma.

4.Expectations

It is expected that the two way approach both internal and external will turn the engineering industries not only to ethics-compliant industries but to vanguards of ethics compliance initiatives. And to have an overall atmosphere of good conduct that will translate into safety and healthiness for people and the environment.

5. Conclusion

It is really a great challenge to pull all resources of government, organizations, and individuals to ensure safety and health of people, and our environment. But considering the need to have a safe world for us to live and the need to prevent our self-induced destruction, we may well justify all the effort put in this direction.

While many beautiful policies, programmes and agencies exist today in some countries in the world and in the fast developing nations, what is visibly absent is a strong enforcement and supervision system. It is hoped that these suggestions may accelerate the existing drive towards this goal and serve as a reference point for future planning and considerations

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