

# DEONTOLOGY

## DEONTOLOGY IN ENGINEERING FIELD

**Proposal of an interregional code**

Edoardo ROVIDA  
Giuseppe SUSANI

# Deontology in engineering field

1. Introduction
  - 1.1 Foreword
  - 1.2 Some definitions
  - 1.3 General criterion to determine a specific deontology
  - 1.4 Use of a determined deontology
  
2. Some examples of ethics
  - 2.0 Introduction
  - 2.1 The base of the Roman ethics
  - 2.2 The contribution of Rotary International to ethics
    - 2.2.1 Proof of the four questions
    - 2.2.2 Application of the proofs of the four questions to the designer's deontology
    - 2.2.3 Application of the "four questions" to the deontology of technical-scientific subjects teacher
  - 2.3 Ippocrate's oath
  
3. Ethics for engineers
  - 3.1 Introduction
  - 3.2 Italian Code
  - 3.3 French Code
  - 3.4 German Code
  - 3.5 Spanish Code
  - 3.6 Proposal of the Milan Order of Engineers
  
4. Conclusions
  
5. Bibliography

## PREFACE

*The Order of the Engineers of Milan Province has been collaborating since long with the similar Regional Organizations of the European Engineers.*

*In particular, contacts have been established, and they still exist, with France (Department Rhone Alps- Grenoble/Lyon) with Germany { Land of Assia-Wiesbaden/Frankfurt) and with Spain (Barcelona).*

*We have chosen to keep regular relations with these three European Regions since they are the most similar to Lombardy for width, population, economical and social development.*

*One of the aims of this collaboration is to find a common Regional Deontological Code to facilitate the reciprocal understanding of the rules and professional behaviors of the engineers operating in the three abovementioned regions, in particular in Lombardy and in Italy.*

*We have therefore prepared a comparative study that summarizes the different deontological codes. This study is shown in this document, together with the various considerations about the Deontology of our profession.*

*To give the whole a European profile, we have written and translated all documents into English.*

*In fact we deem that our engineers must get accustomed to rules and standards that are more and more common and more and more European. Moreover, we are convinced that the English language is a necessary instrument for all our colleagues.*

*Besides, our study aims at facilitating the professions and professionals' "mobility", as strongly required by the European Union.*

*Certainly, a good number of engineers do work and will work in European countries different from the ones they were born and have studied. This document will help them understand the different European deontological rules they are concerned with.*

*A further aim of this study is to give an instrument, as complete as possible, to the Italian engineers who, after their degrees, must face the State Exam. In fact, as it is well known, it is necessary to have some knowledge about the professional ethics, that is the Deontology, to pass the Exam.*

*The study herewith enclosed and the documents collected are the result of the work and experience of Prof. Edoardo Rovida, Milan Polytechnic, and Ing. Giuseppe Susani, a member of the Order of the Engineers in Milan.*

*Warm thanks of the Order of Engineer and my personal ones are given to Prof. Rovida and to Ing. Susani.*

*Alberto Caleca*

*Council Member of the Order of Engineers in Milan*

## 1. INTRODUCTION

### Foreword

Technology can be interpreted according to readings and, consequently, to different ideologies. Among them we can notice the following ones as examples [1]:

#### a) Ideology of the endless progress

It is based on the cumulative character of the human progress. Any discovery, any invention, corrects and widens the previous discovery and the previous innovation. Therefore, thanks to the technology the man should proceed towards better and better stages of life, in an endless progress.

#### b) Political revolutionary ideology

Technology is positive, but there is a limit due to the political economical structures. If a social class becomes dominant, technology can be an instrument of oppression; the oppressed class will only put up a new regime.

#### c) Critical- disastrous ideology

The excessive development of technology has irreparably damaged the man and the environment and cannot cause anything but the man's total alienation.

Each of the above ideologies points out a real but limited aspect, even if exasperated, of the technical progress and therefore each of them reveals its weak points very quickly. For example the ideology of the endless progress is denied by several current problems, such as the environmental problem. As to the political revolutionary ideology we can say that violent methods replace oppressive situations with other different oppressive situations. At last, the critical – disastrous ideology justifies, as a matter of fact, an exasperated fatalism. That results negative at the end.

Anyway, a character common to the three ideologies is the lack of ethical aspects; that's why it is important to reflect on them. Science can be considered as the reading of the Nature Great Book (as Galileo states) and therefore without ethical aspects (in fact such aspects affect the methods and the means of the scientific research, and not the research itself: for example a research implying some people's death, even if it should lead to enrich knowledge, would be unacceptable from an ethical point of view); on the other end technology increases the man's power and therefore is ambivalent. Consequently an ethical instrument for evaluating the actions is necessary. Nowadays, more than ever, it is necessary to question about our actions and their consequences. The quick change that occurs, chiefly in the technical field, involves challenges and continuous reflections, moreover the growing complexity of the technical systems requires skills that couldn't be imagined up to recent times.

In the twentieth century human society reached remarkable targets, but it faced a wide range of emergencies (Table 1) [2].

Table 2 displays the environmental emergencies recognizing some categories.

<b>Emergencies</b>	<b>Examples</b>
Moral	Declining of the moral values in all Countries and in all fields
Cultural	Prevalence of “to do” and “to have” on “to know” and “to be”
Environmental	Human activities, sometimes inconsiderate, and their influence on the environment
Demographic	Excessive and disorderly growth of the population

*Table 1 Some world emergencies*

<b>Environmental emergencies</b>	<b>Examples</b>
Cosmic	Meteorites, space “rubbish”
Planetary	<ul style="list-style-type: none"> <li>a) Water (research of new sources, desalinization, protection of resources)</li> <li>b) Soil (drought), desertification, protection from polluting substances, defence from catastrophic events)</li> <li>c) Food (production, storage, transformation, reduction of waste)</li> <li>d) Energy(sources, production, distribution, reduction of savings)</li> <li>e) Global pollution (reduction of the ozone belt, greenhouse effect)</li> <li>f) Local pollution (acid rains, loss of petrol and chemical products)</li> <li>g) Urban pollution</li> <li>h) Planet monitoring (earthquakes, volcanoes, floods, atmosphere control)</li> </ul>
Local	Abovementioned emergencies in areas that are territorially limited and due to specific local causes

*Table 2 Some environmental emergencies*

It can be interesting to reflect on the interview that Moravia gave to Velichov [3], vice President of the USSR Academy of Sciences. Velichov refers to Chernobyl and warns against two dangers: from one side science and technology allow to carry out great instruments that are potentially destructive, from the other the knowledge of these destructive effects is sometimes very limited or even non-existent.

For instance, we can consider what has been told by [4]. An individual that ignores the concept of “food chain” might consider the pouring of the toxic substance A into the water only from the point of view of the damage to the water living organisms and in the same way we might not consider it as a moral fault. Let’s suppose that the said individual gets to know that the toxic substance A has an effect similar to the one of the metal-mercury and that knows the dynamics of the Minamota disease: at this point he/she knows that the water living organisms belong to a food chain that can be of interest also for the man and he/she cannot consider the pouring of

the substance A into the water as exempt from a moral fault. Therefore, [4] goes on observing that the individual judges the ethical effects of a particular behavior in relation to the data he owns. Therefore, it can happen that the judgment on a particular subject can substantially change by the widening of the knowledge he owns on the subject.

## 1.2. Some definitions

The word “ethics” derives from the Greek “ethos”, costume, attitude, and the word “morals” can be considered as the Latin translation (in Latin “mos” means costume). Ethics (or morals) is therefore the science of costumes, of the attitudes, of the way of behaving and acting.

According to [5] “morals” means the whole of opinions, decisions and actions through which individuals express and recognize what is good and what is evil, whereas “ethics” means the critical reflection on the morals.

The moral vision corresponds to the distinction between what the individual considers “good” and what he considers “evil”. It must be observed that also the “bad” persons have a moral conscience: in fact they follow what they consider as “good”[6].

Let’s consider, for example, two fully opposite persons: Mother Therese and Adolf Hitler. The first had a moral vision leading to the identification of good with helping the poor and the suffering and she adjusted his life to this vision. On the contrary, Adolf Hitler, instead, had a moral vision that identifies the good with the creation of a superior race and his life was oriented accordingly.

The moral vision is therefore personal and needs an instrument of evaluation and correction: this instrument is ethics that can be considered as a rational and coherent system of determining the good and the evil [7]. The terms “morals” and “ethics”, often considered as equivalent and to a great extent as synonyms, have this distinction: ethics is the control and the correction of morals. In the same source [7], some aspects of ethics are reviewed and some university courses on the subject are pointed out, with a particular reference to the methodologies used.

The conditions required by ethics, that is by the evaluation of the actions and of the relative behavior, are referred to:

- a) Reason: it is necessary for the subject to possess the necessary rationality to evaluate the good and the evil, being the subject of the ethics, as well as the capacity to distinguish the good and the evil in relation to the ethics and not to the “moral conscience”.
- b) Ideology, or the whole of principles underlying ethics and pointing out what is good and what is evil. We are therefore concerned with a natural ethics, a Christian ethics, a Marxist ethics and so on.
- c) Free Will: it is obvious that after evaluating the good and the evil with the ethical instrument, the individual must be free from any type of compulsions to act consequently.

Ethics can be also defined according to its own characteristics as:

- a) Theological: it starts from the principle that an ethic action produces good prevailing on evil. According to the theological ethics the target of the action is prevailing on the subject’s intention and on the means to reach it. It can be concisely expressed as “the target justifies the means”.
- b) Deontological: when evaluating an action, the subject’s intention must also be

considered, since it is considered prevailing on the action target. In relation to the subject to be studied, we can still distinguish between: Theoretical ethics: it established the basis of the duty and deals with the laws that tell the human actions and of the conscience, considered as the faculty to know the laws and to apply them to the circumstances.

Practical ethics: it deals with the duties and the infringements.

We speak also of descriptive ethics (it describes the behavior of the human beings) and prescriptive (it gives instructions about duties) and of subjective ethics (it deals with the acting subject, irrespective of the actions and intentions), as well as of objective ethics (it considers the action relative to the common values and to the Institutions).

The utilitarian approach to the ethics must try to get the maximum advantage for the maximum number of people. It can be:

- a) based on the actions: the ethics of each action is evaluated according to a “for and against” criterion, that is in relation to the action itself;
- b) based on the rules: the ethic rules are evaluated according to the benefits implied.

The ethic content and the consequent judgment of an action can vary according to determined circumstances. Some of them can be brought back to the following:

- a) Ignorance that can be referred either to the existence of the law or to the fact that a determined action is included in a particular law; it is always linked to the lack, sometimes faulty, of essential information;
- b) Fear, that can affect both internal and external actions. The fear can refer both to the others’ judgment and to the possibility of doing mistakes, that is “to create a bad impression”;
- c) Violence, that can influence the external actions;
- d) Education that can distort the concept of “good” or “evil”;
- e) Disease, that can press the subject to do actions of which he is not fully responsible, as for example in the case of kleptomania.

The ethic level of a deed can vary in relation to the circumstances where it happens. Some general rules are pointed out hereunder:

- a) An essentially good action can become better for its purpose; for instance if someone works in the best way aiming at the community’s advantage, this can be considered preferable to do it in order to draw the boss’s attention on himself.
- b) A good or neutral action becomes negative if the target is negative; for instance to apply the correct rules of the “design science” it is surely positive, but if it used to produce anti personnel mines becomes obviously negative.
- c) A negative action doesn’t become good if the aim is negative; for instance working in a firm producing the abovementioned mines does not become a positive action if the engineer “has got a family” and must support them.
- d) A good or neutral action with good and bad effects becomes allowed if the good effects overcome the bad ones; for instance not to pass a seriously unprepared student at the state exams has negative effects on the candidate and positive on the community and the advantages of the community are greater than the student’s ones.
- e) A good or bad action for its object and aim, can become better or worse according to the circumstances. For instance, working at one’s best is certainly positive and it



can be even better if the aim is to give a positive service to the community. As further example working superficially is undoubtedly negative and it is even worse if this way of working is done to get a colleague blamed for it.

Deontology studies the duties in relation to specific social situations. If concerned with a determined profession, the deontology is always considered a synonym of “professional ethics” and, therefore, it makes up the whole of the behavioral rules relative to this profession. Deontology is consequently a concept that includes the one of (moral) ethics and of the profession. The last can be considered as an individual’s job where he has got a good level of qualification. The profession has some intrinsic fundamental characteristics [8]:

- a) It requires a remarkable training period;
- b) The training has got an intrinsic remarkable intellectual component
- c) Knowledge and skills are essential to give the society a valid service;
- d) It is characterized by a high level of decisional autonomy;
- e) It requires an ethic rule.

So, this is the link between the profession and the ethics from which deontology comes.

In this book the term “deontology” will be therefore used with this meaning and so as a synonym of “professional ethics”.

Deontology is strictly connected with the subject’s responsibility. In the field of engineering as well as in others, a good test of responsibility [8] can be the question: “before acting in a determined situation how should an engineer behave when there is nobody to control him?” Another criterion is to evaluate our behavior and asking ourselves if such a behavior might be approved if another person should behave in this way towards us, following the old maxim :” don’t do to others what you don’t want to be done to you.”

If the engineer becomes responsible, he meets some obstacles. Among these:

- a) Personal interest, selfishness;
- b) Fear of acting wrongly, fear of the others’ judgment;
- c) Lack of fundamental information;
- d) Egocentricity, that is to consider important only what the subject thinks or does, and underestimate what the others do;
- e) “Microscopic” vision, that can be also very precise and analytical, but it is sectional and limited;
- f) Uncritical acceptance of the authority, that leads to limit the personal autonomy;
- g) Group decisions that deprive the individual of his responsibility.

Ethics and deontology must be part of the university studies. In particular, it is necessary for the student to acquire following ethical skills:

- a) Ethical sensibility, that is the capability of recognizing ethical and social aspects in the engineering problems;
- b) Capability of ethical analysis, aiming at the analysis of the ethical problems in terms of evaluations, values, stakeholders and related interests;
- c) Ethical creativity, considered as capacity to evaluate different points of view in the light of ethical values;
- d) Capability of ethical evaluation, aiming at formulating judgments on the basis of different ethical criteria and taking decisions in keeping with such judgments;



e) Capability of ethical argument intended for justifying ethically determined actions, discussing and evaluating them with other technicians or non technicians.

The ethical principles can be defined as non physical limits to the personal freedom and, as such, they state some duties, some categories can be found where duties are listed.

a) Absolute negative: they forbid always negative actions (for instance not to put the human life in danger.

b) Negative contingent: they forbid negative actions only in a determined context (for instance not to interrupt this work today);

c) Affirmative contingents: they control positive actions in certain circumstances (for example to help a friend in difficulties);

d) Exhortations: they direct towards excellent actions, but not compulsory (for example to give up a right to help a person in difficulties.

The interest for the professional ethics and for the deontology is also confirmed by the great number of scientific articles published in these last years in the conventions chiefly dedicated to the Engineering Education.

Some examples are shown here. In [9] are pointed out the fundamental principles that lead the engineering students to distinguish between honest and dishonest behaviors during the academic activity and some criterions adopted by the Duke University are listed. In [10] it is recognized the importance of an ethical behavior in the profession and a specific university course is suggested. In [10] it is also underlined the importance of ethics, observing that, before starting any action, the engineer should give an ethical connotation to his acting, asking to himself: "how must I act?". In [11] it is pointed out that there is an ethics that is referred to two fundamental trends characterizing the present system, that is globalization and specialization.

The work [12] is devoted to find a professional ethics for teachers of scientific-technical subjects.

In [13] it is shown how the engineer ethics is taught at Houston University chiefly through analysis and case-discussions.

In [14] the ethical meaning of the qualifications, whereas in [15] some proposals to insert ethical contents in the engineering courses are highlighted. In [16] it is said how the engineer ethics is referred to:

a) rules relative to relationships between engineers and work position;

b) rules relative to the relationships of the engineers among each other;

c) rules relative to the relationships of the engineers with other professionals.

d) rules relative to the relationships between the engineers and the community.

The need of an ethical code for engineers is underlined by [17]. In fact, it is important as:

a) Service and protection for the public;

b) Guide and directions about the engineer's obligations

c) Stimulus towards an ethical behavior;

d) Guarantee of a minimum level of ethical excellence, through the sharing of rules common to different engineers;

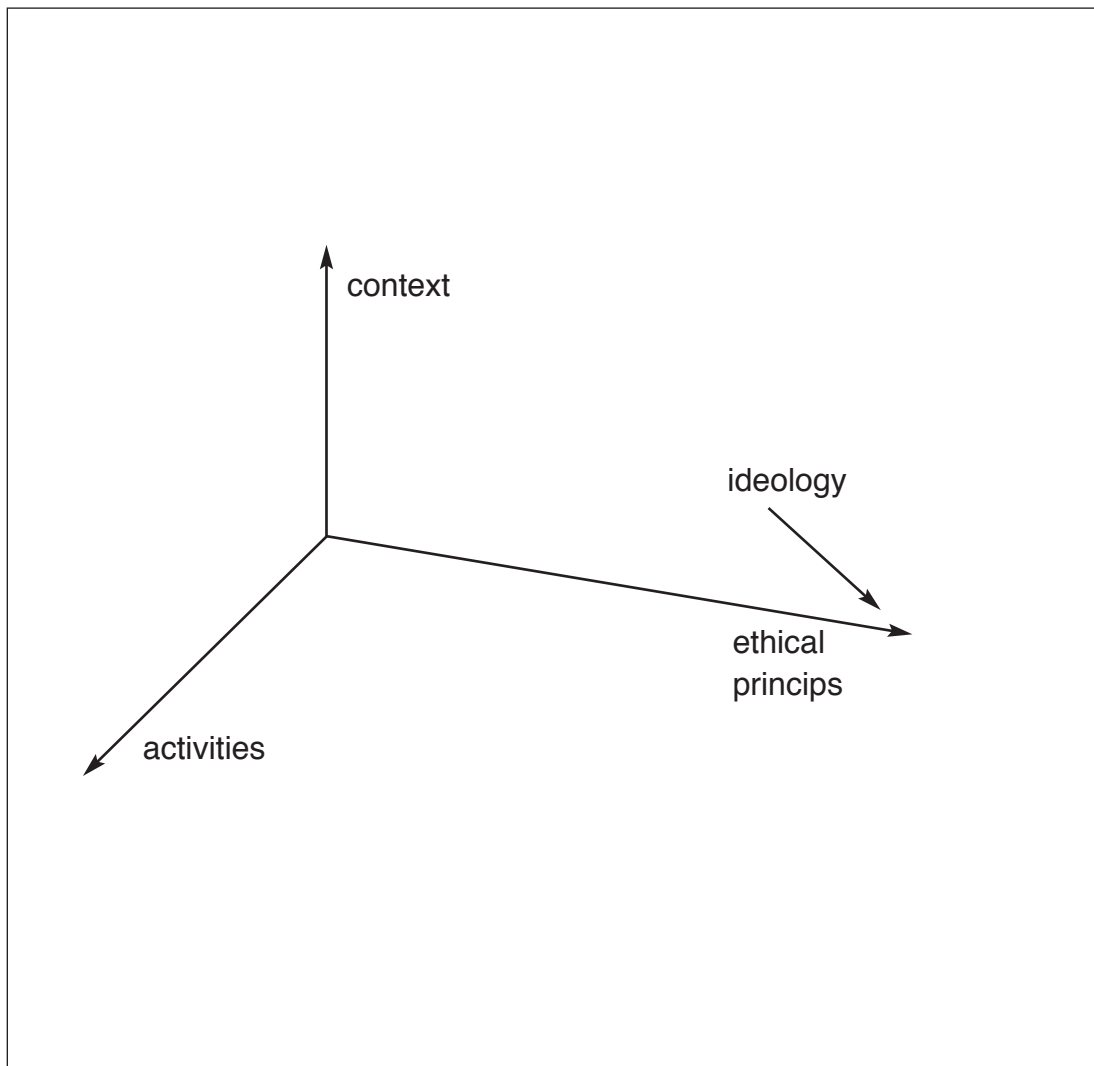
e) Support to a responsible professional competence also with a legal value;

- f) Educational validity, chiefly towards the youth;
- g) Deterrent for the punishment of ethical wrong actions:

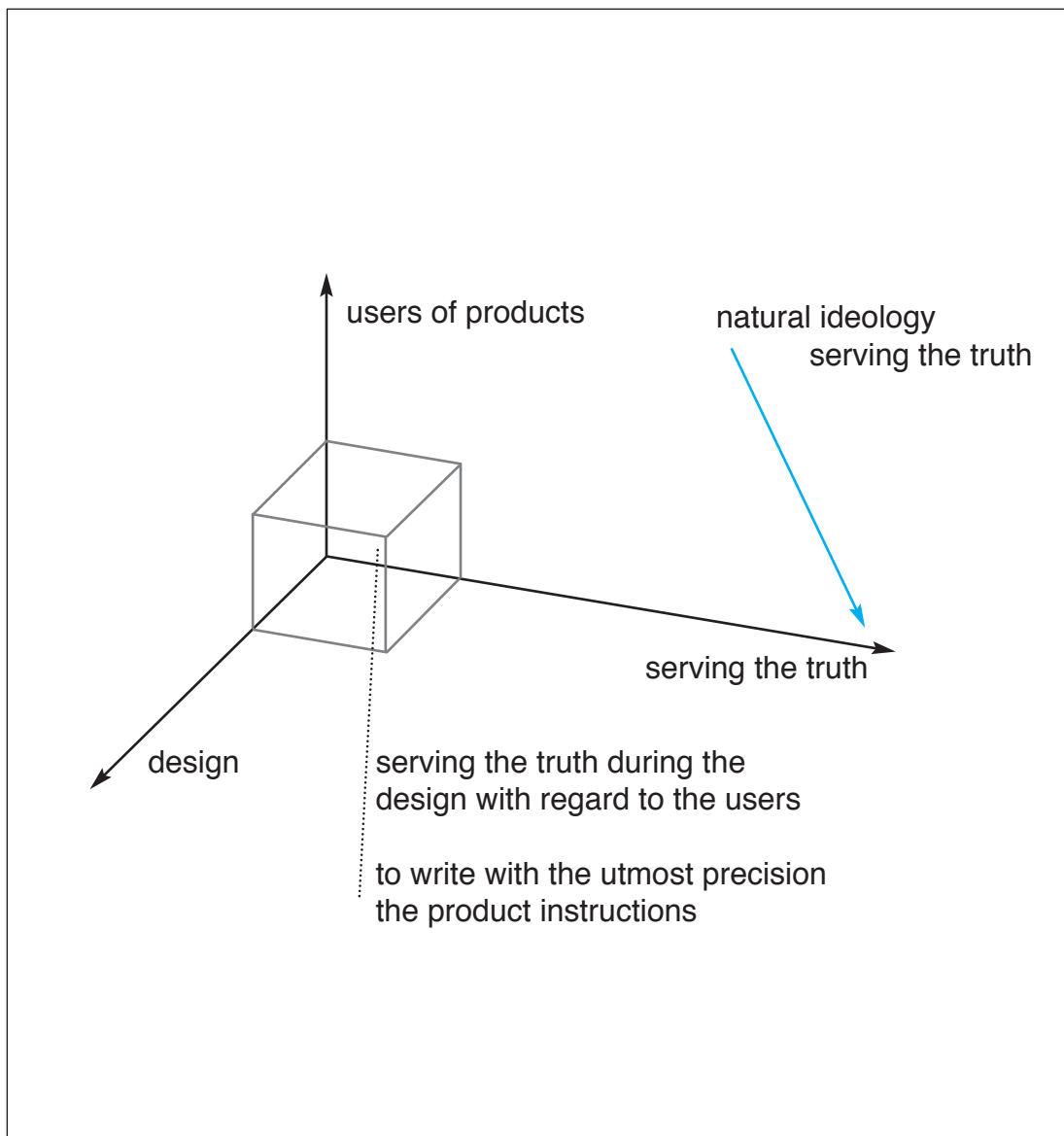
### 1.3 General Criterion to determine a specific deontology

A general criterion for determining a specific deontology relative to a specific profession can be the one deriving from the analysis of the “deontological space” (fig.1). It consists of three axis relative to:

- a) Activities deriving from an analysis of the professional profile in question; for example in the field of engineering we can refer either to the academic courses or to the type of activity carried out;
- b) Contexts of the activities and in particular persons or categories of persons the professional can come into contact with; generally speaking they can be, besides themselves, colleagues, superiors, inferiors, customers, suppliers of products, suppliers of services;
- c) Ethical principles, coming from the ideology to which they refer. So, if we refer to the Christian deontology, the ethical principles will be the evangelical ones, if we refer to the natural deontology, they will be the natural ones and so on. The points of the space, of “coordinate” activities/contexts/principles are the deontological problems, that is the professional situations where it is necessary to take ethical decisions.



*Fig.1 Deontological Space*



*Fig.2 Specific Case to determine a deontology*

Fig. 2 represents a particular case of an application of the general case. From the natural ideology the ethical principle "to serve the truth" can derive. In the specific example, we can consider design as human activity, while the context is the whole of the users of the designed product.

The point of the "deontological space", characterized by the three abovementioned "coordinates" corresponds to the deontological problem "to serve the truth during the design in regard to the users of the product". An analysis of this problem leads to identify the duty to write the product instructions with the utmost precision. Another example could be the one that refers to the following coordinates:

- a) Ethical principle "Not to cause physical damages to the persons"
- b) Activity: "design"
- c) Context: "users of the product"

The deontological problem might be: "to apply with the utmost care the criteria of correct design to reduce at the minimum the risk when using the product. Moreover, to inform with the utmost precision and completeness the users about the residual risk and to identify the criteria of active and passive safety.

#### 1.4 Use of a determined deontology

Once determined a deontology, this can be used in the light of a concept of ethical cycle (Fig.3).

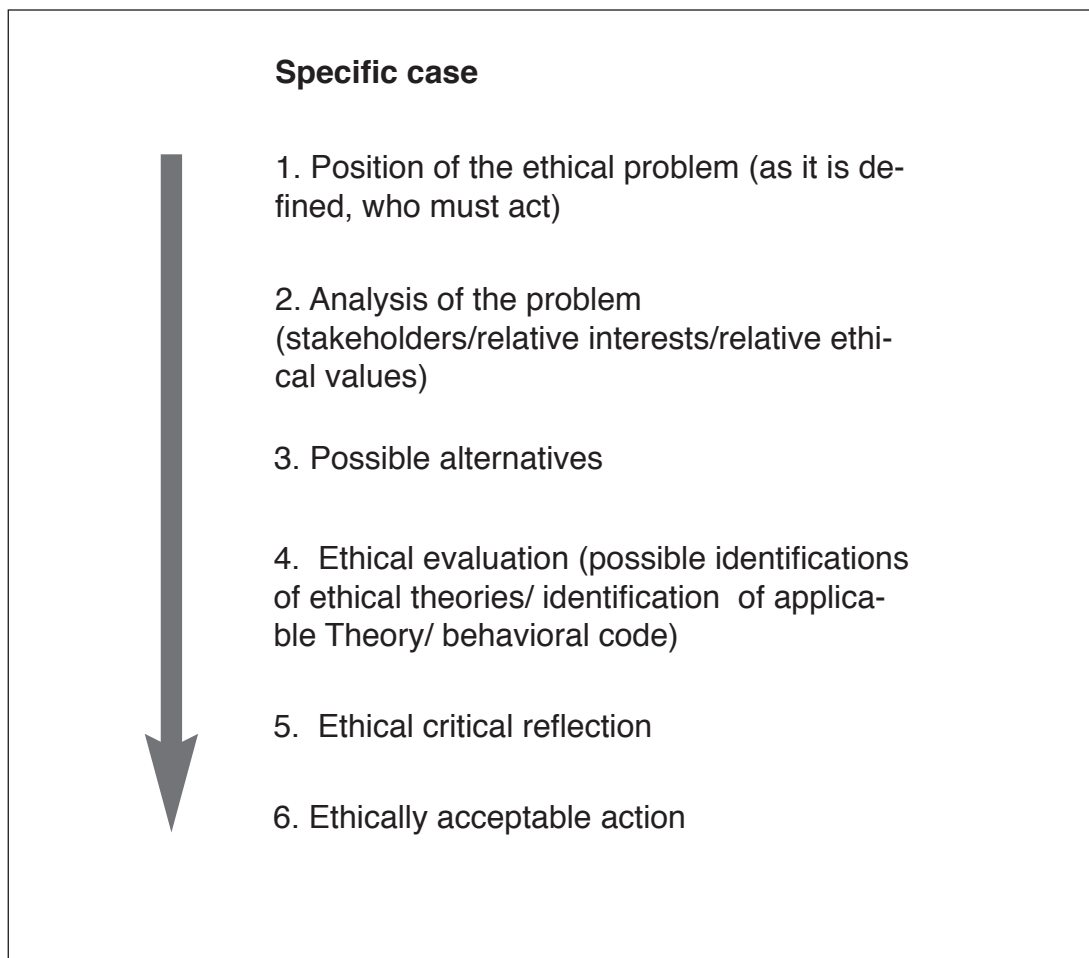


Fig. 3 Scheme of "ethical cycle".

For example let's consider the case in Table 1, coming from the professional experience of one of the authors.

**Table 1. Example of application of the "ethical cycle"**

Phases	Situation
1.Position of the problem	A machine of the building site overturns and crushes a worker that immediately dies. The problem is to identify how the appointed Technical Consultant must act
2. Analysis of the problem	The cause of crushing are recognized in the following: a) The machine is on a ground with a great transverse inclination. b) The container is full of thick concrete c) The reaction couple caused by the drum starting is summed to the overturning couple due to the transverse inclination of the ground. Moreover, but it is not proved, the starting occurs suddenly. The stakeholders are brought back to:

	<ul style="list-style-type: none"> <li>a) The machine's designer.</li> <li>b) The machine's driver</li> </ul>
3. Possible alternatives	<p>They can be brought back to:</p> <ul style="list-style-type: none"> <li>a) Design mistake: the machine must be designed and built in such a way to stand up to the circumstances listed under 2?</li> <li>b) Driving error: the driver must avoid the combination of the circumstances listed under 2?</li> </ul>
4. Ethical evaluations	<ul style="list-style-type: none"> <li>a) The designer's responsibility: he must foresee possible driving errors, but that contemporaneity is really an "unpredictable" combination?</li> <li>b) The driver's responsibility: it can't be foreseen that during the site work, the driver can foresee all those combined actions?</li> </ul>
5. Ethical critical reflection	It seems there aren't clear responsibilities either from the designer or from the driver
6. Ethically unacceptable action	Since, in all honesty, both designer and driver seem not to be faulty, the incident can be considered as caused by mere fatality.

## 2. SOME EXAMPLES OF ETHICS

### 2.0 Introduction

In this chapter some "ethics" of different origins are presented and briefly commented, since they can represent a useful introduction to the fundamental point of this book that is the engineer's deontology.

### 2.1 The base of the Roman ethics

The base of the Roman ethics, on which many legislations are founded even today, is expressed in the maxim of Enea Domizio Ulpiano [18] (Tiro 170 about – Rome 228), one of the greatest Roman jurists, from whom also Giustiniano largely drew for the Digesto. The maxim is the following:

"Iustitia est constans et perpetua voluntas ius suum cuique tribuendi. Iuris praecepta sunt haec: honeste vivere, alterum non laedere, suum cuique tribuere", that is:

Justice consists of the constant and perpetual will to attribute to everyone his own right. The rules of the right are: to live honestly, not to damage the others, to give everyone his own.

When reflecting on this maxim, so succinct, we can't do without being admired by the synthesis, typical of the ancient Rome, and how it is the fundament of any form of justice. It isn't worth to point out that if everybody should observe these rules, the world would be very different!

### 2.2. The contribution of Rotary International to ethics

Rotary International is an association of services, established in 1905, existing in more than 160 countries and with 1.200.000 members, representing all the professions of the civil society. One of the members' targets is to reach the highest professional ethics, for which some criterions of evaluation are hereafter pointed out: The proof of the four questions is the fundamental point of the Rotary ethics. It consists to ask oneself, before any action, the following questions to which it could be obviously answer in the affirmative:

- a. Is it true?
- b. Is it right?
- c. Does it improve the interpersonal relations?
- d. Does it represent an advantage for all people involved?

A workshop organized by one of the authors [19] for the members of the Rotaract (the Rotary youth association) has engaged thirty young partners dealing in the following fields:

- a) Insurance
- b) Communication
- c) Health
- d) Engineering
- e) Architecture
- f) Economy and commerce
- g) Banks
- h) Finance
- i) Company consultancy
- j) Scientific research
- k) Human resources
- l) Marketing
- m) Entrepreneurial activity
- n) Journalism

The young participants have been invited to specify, in relation to their own professional experience, each of the "four questions". The results are in the Table 2.1

Is it true?	Is it right?	Does it improve interpersonal Relations?	Does it represent an advantage for all?
a) To take care of one's skills and professional training	a) To act correctly in all situations	a) To help socialization	a) To put the team's success before one's own success
b) To communicate rightly and autonomously	b) To be loyal, honest and respectful towards all	b) to facilitate the the colleagues' work to cooperate with others	b) to realize something with a useful aim for the mankind c) to create well-being
c) To communicate effectively	c) To respect the laws		
d) Objective control of facts and responsibilities, chiefly regarding the information sources and always verifying if what is written is true	d) To manage equally the human resources e) to reflect well on one's own actions f) one's own actions must be of the utmost transparency	d) to encourage the educational and cultural growth e) to recognize others' skills in the team work f) activity to reach the advantages for the working group	d) to get different ways of thinking to reach an integrated. Knowledge e) to contribute to the growth of the human and professional skills of all people Involved f) To meet all needs

Table 2.1. Application of the Rotary "four questions" to specific cases obtained from the different professions:

### 2.3. Ippocrate's oath

Even if it is not an argument concerning the engineer's profession, we deem that a consideration about Ippocrate's oath can be interesting, since it summarizes the medical professional deontology, in the modern version, strictly derived from the original one.

“Conscious of the importance and solemnity of the action I do and of the commitment I take on, I swear:

- To practice medicine freely and with independence of judgment and behavior avoiding any undue conditioning;
- To pursue the life defense, the guardianship of the human physical and psychological health and the relief from suffering of which all my professional actions will be inspired with responsibility and constant scientific cultural and social commitment;
- To cure each patient with the same care and diligence, irrespective of any race, religion, nationality, social and ideological condition and promoting the elimination of any form of discrimination in the sanitary field;
- Not to act in such a way as to cause a person's death deliberately;
- To avoid any diagnostic and therapeutic perseverence;
- To promote the therapeutic alliance with the patient based on confidence and reciprocal information, respecting and sharing the principles of the medical art;
- To keep to the ethical principles of the human solidarity against which I will never use my knowledge, in the respect of the life and of the person;
- To put my knowledge at disposal of the medicine progress;
- To entrust my professional reputation only to my competence and to my moral qualities;
- To avoid, even out of the professional practice, any action and behavior that can damage the dignity of the profession;
- To respect the colleagues even in case of different opinions;
- To respect and facilitate the right of the doctor's free choice;
- To give urgent assistance to anyone who needs it and to be at disposal of the competent authority in case of public disaster;
- To keep the professional secret and to defend the discretion of all that has been revealed to me, that I see or I have seen, understood or guessed in the practice of my profession or related to my condition;
- To give, in science and conscience, my work with diligence, ability and prudence and with equity, observing the deontological rules of the medical practice and the legal ones that are not in contrast with the aims of my profession.”

## 3. ETHICS FOR ENGINEERS

### 3.1 INTRODUCTION

It can be useful to examine some European Associations of Engineers, each of which has got its own ethical code.

In Italy there are the Provincial Orders of Engineers that are independent and autonomous, acknowledged and regulated by a State Law (n.1395 dated 24th June 1923) “to protect the title and profession of the engineers”. These Orders are controlled by the Ministry of Justice and their organization is under the National Council of Engineers. The enrolment is necessary to do some determined professional acts and it can be done only after the State Exam has been passed.



Each Provincial Order keeps and updates a register of the members, divided into three sectors, the Civil, of the Information and Industrial. It has also two sections: A for engineers graduated with a five years' course, B for graduates with a three years' course.

As to Europe, the Italian situation can represent a particular case if we consider the abovementioned Institutional features.

In France the URISF, Union Régional des Ingénieurs et Scientifiques de France, gathers a variety of engineers and qualified technician, with different qualifications according to the Universities, high schools and Institutes that have issued them. Differently from the Italian Orders, the URISF is not regulated by a Law but it is an Association of reference and representation of the French engineers.

In Germany there is the VDI, Verein Deutscher Ingenieure, that gets together the most of the German industrial engineers. It is a scientific-technical Association, which was founded in the second half of the nineteenth century, and it has an intense activity of formation, research, spreading and publishing. It has also a representative function of its members.

The German civil engineers are members of the Ingenieurkammer of their Lands. This association is very similar to the Italian Orders as to organization, rules and State acknowledgment.

In Spain the engineers are members of the Colegios Oficiales, different according to their specializations. Being founded and ruled by State Laws (Law of 30th November 1992) the "Colegios" are very similar to our Orders also for their organization.

Periodical meetings for collaboration, information and experience exchanges are held among the Milan Order, the URISF of the Savoy-Delfinate, the VDI of Assia Land and the Colegio Regional de Ingenieros Industriales of Catalunya (Barcelona).

Lately, the Milan Order has proposed the drawing of an Interregional Deontological Code of the Engineer that can be adopted by the four regions.

The point of departure are the deontological codes that each national organization has drawn and adopted:

- Charte d'Éthique de l'Ingénieur (URISF, France)
- Etische Grundsätze des Ingenieurberufs (VDI, Germany)
- Código Deontológico (Consejo General de Colegios Oficiales de Ingenieros de Espana)
- Codice Deontologico (CNI, Italia)

The Deontological Codes examined

## 1 The French "Charte d'éthique"

The compilers seem to be particularly worried about the power that the scientific discoveries and their technical applications can have on the society and on the environment.

In parallel, the means of communication, which are more and more intruding, sophisticated and within everybody's reach, can have a double influence on the public opinion. On one side they can create unjustified securities and on the other they can create psychosis and unjustified fear.

The engineer's duty is to dominate technology, which must be put at the humanity's

service, and to inform correctly the Company about the risks and advantages of the scientific discoveries. Therefore, the engineer has the fundamental role of an intermediary between science on one hand and human society and environment on the other. The initiatives, the innovations and the technologies he has carried out must have the development sustainability as the primary objective.

From the deontological point of view, the engineer's professional profile is characterized by:

- objectivity in the choices and judgments
- availability towards partners and colleagues
- humility in acknowledging his errors
- commitment for a constant updating of his knowledge and skills for the development of science and technology.

When acting in his profession the engineer:

- is aware of his own limits
- obeys his own conscience, which must be deeply correct
- identifies the incompatibilities and keeps them into account
- has the maximum respect for his colleagues and collaborators, promoting the development and the spreading of their skills.

When performing his mission the engineer must:

- attain the best results, integrating the human, economical, financial, social and environmental components of his work
- respect health, safety and environment
- evaluate carefully the consequences of his initiatives on the persons and goods; prevent risks
- acknowledge his own responsibilities and be able to take the necessary decisions in any circumstance.

## **2) The German Ethische Grundsätze**

They are introduced by a "preamble" that defines the engineer's position in the modern society: he is responsible for the application of science and for the technology development, being constantly inspired and guided by the principles of the professional ethics.

The VDI, the organism representative of the engineers, has the fundamental function of interpreting the problems and mediating the contrasts.

"Responsibility" and "awareness" are the two recurring concepts.

Responsibility, towards the society, the customers, the public Institutions, the professional associations:

- for the possible consequences of his activity
- for the reliability, the quality, the safety of the technological products
- for the fact that the users must get complete information about the products instructions and about possible risks
- for the application of the national laws and of the Land to which the engineer belongs.

Awareness

- of the effects of science and technology developments on the environment and on the humanity
- of the necessity of controlling these developments and directing them according to criteria of sustainability
- of the necessity to face disputes and discussions being available to the dialogue and avoiding to refuse collaboration.

The engineer's civil commitment is emphasized pointing out:

- the contribution of his Competence to the drawing up of rules and laws relative to the field of safety, development and economy
- the continuous updating of his knowledge
- the recall and the respect for Ethics.

As you can notice, the two abovementioned deontological codes insist mainly on the engineer's "moral profile".

They put the stress on his "basic and continuous professional formation", his behavior correctness, the social and political commitment.

In case of problems and disputes, it is advisable to address to a representative organism. In Italy and Spain, where the representative organism exists by law, some precise institutional rules are added to the ethic values.

### 3) The Italian Deontological Code

The Italian Order of Engineers has the precise aim to protect the engineer's profession and at the same time the interests (broadly speaking) of the persons that can avail of their services.

All persons that want to be self-employed must be registered as members of the Order. Consequently, the Deontological Code contains particular rules for the self-employed engineers.

In the "General Principles", universal concepts and values are contained, such as the respect for the laws of the Country, of the Constitution principles and of the European Community regulations.

We remind that the engineer's profession is an activity of public interest; this means a precise responsibility not only towards the customers but also towards the whole community. Honesty is pointed out when accepting a commitment; the Formation must be adequate, the commitments must be carried out with Diligence and the cases of Incompatibility must be defined and excluded.

Being chiefly services of self-employment, it is pointed out the importance of "Signing" (the signature) of the project, which means a whole assumption of responsibility for what the engineer in person has carried out, whereas the skills of each partner must be respected in case of a group work.

In the contacts with the Order the engineer must have a behavior of:

- Collaboration: availability to give all the explanations required in case of summoning from the Council or from President
- Commitment to adapt to possible decisions from the Council on matters he is concerned with.

The chapter relative to the colleagues' relations contains some fundamental behavioral rules such as Loyalty and Correctness towards persons whom he collaborates with, even acting in fields different from the one of the engineering.

Correctness and loyalty are shown also by avoiding critics and judgments on the colleagues' actions since this task is reserved to the Council and to the President of the Order.

The taking over, for different reasons, of a commitment given to another colleague must be done with precise instructions relative to a correct flow of information addressed to all that are concerned, professionals and customers. In case of disputes the arbitrator is always the Council of the Order.

The contacts with the customer must be loyal and correct too.

Therefore, the engineer must

- Respect the professional secret
- Define, with precision and clarity, the contents and the terms of the professional commitments he has received
- Agree on a fee or retribution that is in keeping with the law
- Not accept fees other than the ones agreed with the customer by a third party
- Clear up the arising of possible situations that can cause conflicts of interests.

In the chapter concerning the relations with the society and the environment are pointed out:

- the life protection and the safeguard of the person's public health
- the safeguard of the environment and of the ecological balance
- the preservation of historical, cultural, artistic goods and of the landscape
- the enhancing of natural resources
- the rational use of the energy resources
- the participation to the life of the society, under conditions of autonomy and independence from any conditioning that can damage the professional dignity.

In the use of advertising no confrontations or denigrations are allowed. The information supplied must be correct and faithful.

Afterwards a series of "Rules of Carrying out", drawn out by the CNI, are listed; each Provincial Order can work out and widen them.

The Code can be found at The Ministry of Law, the CNI, the Provincial Orders, the Judiciary and administrative Offices concerned. It is therefore an official document with legal value.

The "Rules of Carrying out" reaffirm some fundamental concepts such as:

- the conditions of incompatibility concerning the commitments in Public corporations, committees, controlling plans, participation to competitions, subcontracts
- the unfair competition at colleagues' detriment, that can be carried out in different ways and circumstances
- the commitment towards the community: the Code considers the tax evasion not only as an offence but even as a disciplinary infringement.

It is also recalled the indisputable function of control and sanction carried out by the Order, whose decisions the professional must obey.

#### **4) The "Código Deontológico del Consejo General de Colegios de Ingenieros Industriales"**

The basic ethical position of the Spanish Colegios Oficiales is similar to the one of the colleagues of other countries taken into consideration and, apart some peculiarities, it is quite like the Italian Deontological Code as to its planning.

Like the Italian Code the "Codigo" is well developed and detailed.

In the Introduction the concept of "profession disciplined by a College", an Institution of public law in charge of the profession control and protection.

The Code, divided into chapters and paragraphs, enumerates and describes:

a) The duties of the industrial engineers:

-The Autonomy

-the Integrity and the Loyalty, that the engineer must express observing the laws in force, avoiding to use the information he can get thanks to preferential positions towards the public Administration

-accepting only commitments consistent with his skills and with his availability of time and means, always keeping an objective behavior free from any conditioning

-not delaying without justifications the time of carrying out the work

-validating only his own projects by his signature

-avoiding to give negative unjustified judgments on other professionals

b) the society and environment protection: the society's safety and well-being, the environment protection and the exploitation of the human resources have the absolute priority.

c) the responsibility, as awareness of his own actions and decisions, always aimed at ethical principles

d) the respect of the rights of intellectual properties

e) the abstention from deceptive advertising

f) the honesty in demanding of the fees due.

A chapter (as for the Italian Code) is concerned with the incompatibilities that can arise from familiar interests, the taking up of commitments from a public enterprise, the function of "college expert" as our CTU (appointed technical consultant), being a member of a college organism.

The "duties towards the customer" are recalled: the engineer's services must be at the "highest level" and must aim at the protection of the customer's interests. The customer must be given all the information about the content of the services, about possible variations, costs and about the possible contribution of other professionals.

In the relations with the Public Administration the engineer must contribute with his skills and experience to the continuous updating and improvement of the technical rules in force. There is also the duty to inform the Authority about cases of anomalous behavior towards the law and the professional ethics.

As an employee in a firm, the engineer must protect the firm's legitimate interests, require the respect of the rules concerning the safety and the work hygiene, as well as keep the maximum discretion about the professional information he might know. As to the suppliers the engineer's behavior must be loyal and disinterested.

The engineer must respect the professional secret carefully, except for possible serious damages for the community. Anyhow, in these cases it is necessary to apply to the College and to its dean (President).

In the possible contacts of interprofessional collaboration the engineer is fully responsible for the work of his competence and deals with the colleagues of other subjects with loyalty and respect. The College is the sole and undisputed arbitrator in case of professional disputes.

Other cases are considered such as:

-the right of intellectual property and of exclusive

-the procedures of the appointment interruption and taking over, with the duty of

transmission of the information to the interested parties

-the civil responsibility that involves a remarkable insurance coverage for the risks taken on towards third parties

In conclusion, the Spanish code sends the decisions and the measures back, after possible non-fulfilments, to the Professional College, which is subordinate in turn, to the “General States”.

The deontological regime of the multidisciplinary companies must keep in to consideration the specific deontology of the specializations of the single partners.

### **5)”The Code of the professional conduct” of the European Civil Professional Engineers”**

In the year 2000 the “code of professional conduct” was issued in Europe, edited by the European Council of Civil Engineers”.

In this code, as in the others previously examined, the concepts relative to the safety of health, environment and society, the “promotion of culture and of the quality of life”, the service to innovation are pointed out. In particular the “dynamic” character of the Code is emphasized since it must not be considered as a mere list of duties and prohibitions to be observed more or less passively. Therefore the engineer’s duties are examined:

- Towards the society
- Towards the environment
- Towards the customers and the employers
- Towards the colleagues
- Towards the profession itself

### **The Interregional Deontological Code**

Our age is characterized by the wide development of the media, by the freedom of movement in Europe and therefore by the theoretical possibility for the engineers to work out of their countries.

Consequently, it is useful to set out a deontological code that contains not only the common ethical rules but also more particular rules that characterize the deontological regime of each country.

The proposal of a “Deontological Interregional Codes” that follows aims at meeting this need. The five sources abovementioned make up the basis for the Code. The compilers have tried to integrate and match them, anyway respecting the peculiarities of each country’s ethics.

It could represent a Common Code of Conduct aiming at orienting the engineers willing to work in Europe.



## 3.2 Italian Deontological Code

ORDINE DEGLI INGEGNERI DELLA PROVINCIA DI MILANO

### DEONTOLOGICAL CODE AND FULFILMENT RULES

Approved by C.N.I. in the session of 01. 12. 2006

Adopted by deliberation of the Order's Council on 20. 12. 2006

Updated by C.N.I. in the session of 20. 12. 2007

Adopted by Order's Council on 20. 12. 2008

#### 1 General Principles

1.1 The profession of engineer must be carried out in the respect of the laws of the Country, of the principles of Constitution and the European Community rules.

The profession of engineer is an activity of public interest.

The engineer is personally responsible for his own work with respect to both the customer and the collectivity.

1.2 Anyone who operate as an engineer, even if he is a citizen of another country, is bound to respect and make third persons respect this deontological code aiming at the safeguard of the dignity of the profession.

1.3 The present rules must be applied for professional services given in way both occasional and permanent.

1.4 The engineer carries out the commitments with care and diligence. He will not carry out his professional duties in conditions of incompatibility with his own legal state, or when his own or his customer's interests are in contrast with his professional duties.

The engineer refuses to accept tasks for them he retains not to have the convenient qualification or convenient power for the accomplishment of the undertaken tasks.

1.5 The engineer undertakes only the professional commitments he has carried out in first person and or directly; moreover he does not undertake the professional commitments in an equal way with persons that cannot undertake them for the rules in force.

The engineer signs only the professional commitments in a collective way or in group only when the limits of professional competence and responsibility of the single members of the college or of the group are obeyed and specified.

The limits must be declared since beginning of the collaboration.

1.6 The engineer must improve and update his capability to meet the needs of the individual customers and of the community to obtain the best result related to the costs and the conditions of realization.

#### 2 Relations with the Order

2.1 The membership of the engineer to the Order implies the duty of collaborating with the Council of the Order. Therefore the engineer is obliged, if convoked by the Council or by its President, to introduce himself and to give all requested explanations.

2.2 The engineer conforms himself to the deliberations of the Council of the Order, if it deliberated exerting its institutional competences.

#### 3 Relations with the colleagues

3.1 The engineer must stamp his own professional relations with the colleagues at



the maximum loyalty and correctness, with the aim of maintaining a common culture and professional identity even in the different sectors of the profession.

3.2 This loyalty and correctness must be extended and required also in respect to other colleagues performing the intellectual professions and in particular the ones having relations with the profession of engineer.

3.3 The engineer must abstain from criticizing and denigrating the colleagues, and, in case he entertains caused reserves about the professional behavior of a colleague, he must inform the President of the Order and comply to his directions.

3.4 The engineer who is called to accept a task already given to another colleagues, can accept it only after the customer has communicated to the previously appointed colleagues the final exemption; moreover he must inform in writing the professional/s he has replaced. In case of dispute, he must inform the Council of the Order about the reasons justifying the substitution.

3.5 The engineer cannot avail himself of means incompatible with his own dignity to get professional commitments such as the extolling of his own qualities in denigration of the others' or supplying advantages or assurances out of the professional relation.

#### 4 Relations with the customer

4.1 The relation with the customer must be based on trust and must be stamped at the utmost loyalty, clarity and correctness.

4.2 The engineer has the duty to keep the professional secret; therefore, he cannot spread what he came to know of in carrying out his professional tasks, without explicit authorization of the customer.

4.3 The engineer must clearly define in advance with the customer the contents and the terms of the professional duties he has accepted in the respect of this code.

4.4 In relations with the customer, either private or public, the services must be paid according to the rules in force. Firm remains the duty of observing the rules of the art. 36 of the Constitution, and saving the dignity of the profession, according with art. 2233 of the Italian Civil Code.

4.5 The engineer cannot accept from third persons any fees, direct or indirect, apart from the ones due to him by the Customer without communicating to him the type, reason and amount and without receiving a written authorization for the payment.

4.6 Moreover, should the engineer have any personal interests on materials or building procedures proposed for the works ordered to him, he must inform the customer about the type or the presence of those relations that might cause a suspect of professional partiality or a violation of ethical rules.

#### 5 Relations with the Community and the Territory

5.1 The professional services of the engineers should be carried out mainly taking care of the life's and human health's protection.

5.2 The engineer is bound to have a correct participation to the life of the community to which he belongs and he must undertake that the engineers do not bear any pressure that can be detrimental to their dignity.

5.3 While practicing his activity and in the limits of his duties the engineer is bound to avoid to cause environment alterations such as to affect negatively the ecological balance and the preservation of the cultural, artistic, historical goods as well as the ones of the landscape.

5.4 Moreover, he must aim at the maximum exploitation of the natural resources and at the minimum waste of the energy sources.

## 6 About publicity

6.1 Being understood that the comparative or denigrating publicity is forbidden, he is allowed anyhow to advertise about his qualifications, his professional specializations, the characteristics of the service offered and the criteria to determine the fees of the services and the costs.

6.2 The Council of the Order is supervising on the observance of the principles of transparency, honesty and truthfulness of the advertising messages.

6.3 The distorted use of the advertising instrument and the violation of limits and principles herein pointed out must be considered illicit.

## 7 About the professional companies

7.1 The professional services, even if interdisciplinary, can be supplied to the users in an associative or company form in the ways and in terms in force.

7.2 The professional services must be given under the direction and responsibility of one or more associates /members whose names must be communicated to the customer in advance.

## 8 Conclusive instruction

8.1 This Code is accompanied by norms of execution, worked out by C.N.I. (National Council of Engineers), which can be integrated by each Order's Provincial Council, on condition that they don't oppose this Code, for the best protection of the professional exercise and the safeguarding of the category's dignity, in the peculiar environmental reality where the Council is operating.

8.2 This Code is deposited nearby to the Italian Ministry of Mercy and Justice, the C.N.I., the Professional Orders, the concerned legal and administrative Offices.

## 9 Fulfillment norms of the Deontological Code

### Introduction

These norms aim to give indications on the fulfillment of the Deontological Code. Here are reported some situations, which can't be considered exhaustive, thus meaning that particular cases, not explicitly pointed out, are not to be considered excluded.

Breaches of this Code allow the pursuance of the penalties foreseen by the Regulation for the professions of engineer and architect approved with Royal Decree of 23.10 1925, N. 2537.

### About incompatibility

1 Incompatibility conditions are chiefly recognized in the following cases:

- appointment as a judge in a competitive examination to which another professional takes part as a competitor (or viceversa) having relationship links or a professional permanent collaboration with the first, or anyhow having relations that can endanger the objectivity of the judgment;
- abuse, direct or through a third party, of the powers related to his appointment to get advantages for himself or for others;
- practice of the free profession in contrast with specific rules that forbid it and without authorization of the competent authorities (in the case of subordinate engineers, administrators, etc.)
- collaboration, under any form, to the planning, building, installation, modifications,

repair and servicing of plants, machinery, devices, equipment, buildings and structures for which the engineer receives the task for the homologation, testing or periodical surveys aiming at the safety.

- It being understood all that provided by the state or regional measures on this subject, the engineer that writes or has written a regulating plan, a plan of manufacturing or other urban instruments of public initiative and the long term program of realization, must refrain from accepting from private customers professional tasks of projecting concerning the area of the urban instrument, starting from the moment of appointment up to the approval.

- Considering the bureaucratic-administrative difficulties of the public Boards and the politic inertia which can wide the time between the appointment and the final approval of the urban instruments, it is necessary to clear that the period of time of incompatibility depending on the deontological norms is to be intended the one limited till the first adoption of the instrument by the customer Administration.

- This rule must be applied also to those professionals that have a permanent relation of collaboration with the author of the plan.

There is also incompatibility in contrast with the engineer's duties such as:

- In the participation to competitive examination whose conditions have been considered detrimental to the engineer's rights and dignity, provided that a formal warning has been issued and that the same has been communicated by writing to the candidates in due time;

In the submission to the customer's requests that can contravene laws and rules in force.

Carrying out the undertaken job, the engineer is bound to avoid all forms of collaboration which can be identified like a subcontract or exploitation of brain-work; moreover, he must refuse to justify the abusive work.

About the relations with the Organisms of self-government.

The commitments normally required to the members by the Council of the Order, the Federation and/or the Regional and the National Council are:

- To communicate in time to the Council the received appointments in representation of the Council or of other Organisms.

- To carry out the office in the foreseen terms.

- To accept the reconfirmation of the same office only in cases admitted by the Council or by other appointing Organism.

- To give continuously his own service for the entire term of the appointment, assiduously and diligently monitoring the works in progress, indicating with promptness to the Council of the Order all infringements or supposed infringements of deontological norms, like laws of the State, which he got to know during the fulfillment of his task.

- To resign in time in case of impossibility of respecting the assumed charge

- To check the perfect observance of the norms regulating the works to which man participates.

About the relations with colleagues and collaborators.

The engineer must stamp his own professional relations with the colleagues at the maximum loyalty and correctness.

The engineer assumes the total responsibility of the organization of the structure that uses to carry out the received job, and of the product of the organization. The engineers is also responsible for his collaborators, for which he must define, follow

and control the work, carried and to carry out. Illicit competition can be displayed in many forms:

- denigrating criticisms about the professional behavior of a colleague;
- offer of services by proposal to a possible customer, of projects carried out on his own initiative;
- operations aimed to substitute a colleague who received or is going to receive a professional charge;
- attributing to himself the paternity of a work made in collaboration, without explaining the real contribution of the collaborators;
- taking advantage of his own position upon public Administrations or Offices to obtain professional tasks, directly or through the medium of a third party;
- abusing of advertising media of his own professional activity, which can damage the professional dignity.

About the relations with the customer.

The engineer cannot, without customer's or employer's authorization, spread technical secrets which got to know carrying out his tasks. Moreover, he cannot utilize, to prejudice the customer, the information given to him and the results of tests and researches made to carry out the committed task.

Free professional services can be given only in case of particular ideal or humanitarian motivations.

Can be considered not chargeable all services of help or consultancy for colleagues in trouble because of their limited experience, or the excessive load of the work.

About the relations with the society and the environment.

The fiscal evasion in the professional field is considered as a disciplinary infringement, provided that it has been assessed.

### **3.3 French Code (Engineer's ethical chart)**

(Approved by the General Assembly of 12 May, 2001)

Preamble

Technology, which is more and more developed and powerful, brings great advantages in the daily life, in the development of our society and of the environment, but unfortunately it brings risks of great damages too.

Therefore, whereas its complexity makes it rather difficult to be understood and the information power increases, the lack of information can lead the public opinion to exaggerated and unreasonable fears as well as to groundless psychosis.

Consequently, the engineer must take an essential and two-fold role in the society: the first is the subservience of the technology to the good of the human community, with the diffusion of information about its real possibilities and its limits. The second is the evaluation of the advantages and risks involved.

The engineer must have a rigorous behavior owing to the characteristics of his profession; it is always more and more imperative that he must clarify and explicit principles that can be the basis for such a behavior.

For these reasons, the French National Council of Engineers and Scientifics (CNISF) provided itself of an Ethical Chart.

This Chart must be considered like the profession of faith of all who are represented in the French Index of Engineers, created by the CNISF.

Being reference for the engineers, the Chart will help the learner-engineers to get ready for the exercise of their own profession.

The Chart undoes and substitutes the former “ Code of conduct ” of CNISF.

The appellation “Code of conduct” will be nearly reserved to the documents defining the correct behavior in each engineer’s trade of which the not observance can require the application of penalties.

CNISF thanks in advance all who, by their intervention, will contribute to have the Chart known, respected, lived and in progress.

### Engineer’s Ethical Chart

- The engineer in the society

The engineer is a responsible citizen that ensures the link among the sciences, the technology and the human community and he is involved in civil actions aiming at the common good.

The engineer spreads his knowledge and transmits his experience at the service of the society.

The engineer is aware and makes aware of the impact of the technical achievement on the environment.

The engineer conforms his acts to trend of “durable development ”.

- The engineer and his competences

The engineer is a source of innovation and motor of progress.

The engineer is objective and methodical in his behavior and in his judgments. He tries to explain the grounds of his decisions.

The engineer punctually upgrades his know how and competences depending on the evolution of the sciences and the techniques.

The engineer pays attention to his partners; he is open to the other subjects.

The engineer can acknowledge his own faults, take them into consideration, and get chase for the future.

- The engineer and his work

The engineer totally makes use of his competences, being conscious of theirs limits. The engineer respects loyally the culture and the values of the enterprise he collaborates with, as well as of the partners and customers ones. He will not act against his professional conscience and he will keep into account the incompatibilities that might occur.

The engineer respects the opinions of his professional partners. He is open and available for any confrontation that may arise.

The engineer will behave with loyalty and equity in respect to his collaborators, without any discrimination. He will encourage them to develop their skills and to grow in their professions.

- The engineer and his missions

The engineer aims at the best result exploiting all the means available, integrating



the human, economical, financial, social and environmental dimensions.

The engineer holds account the duties imposed him by his missions and mainly complies with those related to the health, the safety and the environment.

The engineer integrates in his analyses and decisions the whole proper interests of which he is responsible, and also any consequence on the persons and the goods. He anticipates the risks and the chances; he strains to benefit from them and to eliminate negative effects.

The engineer is rigorous in his analysis, method of treatment, taking of decision, choice of solution.

The engineer, facing to an unforeseen event, takes his initiatives without waiting, so allowing to face them in the best conditions, and gives an exhaustive explanation to the appropriate persons.

### 3.4 German Code (VDI)

#### o. Preamble

Engineers recognise natural sciences and engineering as important powers shaping society and human life today and tomorrow. Therefore engineers are aware of their specific responsibility. They orient their professional actions towards fundamentals and criteria of ethics and implement them into practice. The fundamentals suggested here offer such orientation and support for engineers as they are confronted with conflicting professional responsibilities.

The Association of Engineers in Germany (VDI)

- contributes to raising awareness about engineering ethics,
- offers consultancy and conflict resolution, and
- assists in all controversies related to issues of responsibility in engineering.

#### 1. Responsibilities

1.1 Engineers are responsible for their professional actions and the resulting outcomes. According to professional standards, they fulfil their tasks as they correspond to their competencies and qualifications. Engineers perform these tasks and actions carrying both individual and shared responsibilities.

1.2 Engineers are responsible for their actions to the engineering community, to political and societal institutions as well as to their employers, customers, and technology users.

1.3 Engineers know the relevant laws and regulations of their countries. They honour them insofar as they do not contradict universal ethical principles. They are committed to applying them in their professional environment. Beyond such application they invest their professional and critical competencies into improving and developing further these laws and regulations.

1.4 Engineers are committed to developing sensible technology and technical solutions. They accept responsibility for quality, reliability, and safety of new technical products and processes. Their responsibilities include technical documentation as well as informing customers about both appropriate use and possible dangers of misuse of new technical solutions. They furthermore include:

- defining the technical characteristics of such products and processes
- suggesting alternative technical solutions and approaches, and
- taking into consideration the possibilities of unwanted technological developments and deliberate misuse of products and processes.

## 2. Orientation

2.1 Engineers are aware of the embeddedness of technical systems into their societal, economic and ecological context. Therefore they design technology corresponding to the criteria and values implied: the societal, economic and ecological feasibility of technical systems; their usability and safety; their contribution to health, personal development and welfare of the citizens; their impact on the lives of future generations (as previously outlined in the VDI Document 3780).

2.2 The fundamental orientation in designing new technological solutions is to maintain today and for future generations, the options of acting in freedom and responsibility.

Engineers thus avoid actions which may compel them to accept given constraints (e.g. the arbitrary pressures of crises or the forces of short-term profitability). On the contrary, engineers consider the values of individual freedom and their corresponding societal, economic, and ecological conditions the main prerequisites to the welfare of all citizens within modern society - excluding extrinsic or dogmatic control.

2.3 Engineers orient their professional responsibility on the same fundamentals of ethics as everybody else within society. Therefore engineers should not create products which are obviously to be used in unethical ways (e.g. products banned by international agreement). Furthermore they may not accept far-reaching dangers or uncontrollable risks caused by their technical solutions.

2.4 In cases of conflicting values, engineers give priority:

- to the values of humanity over the dynamics of nature
- to issues of human rights over technology implementation and exploitation
- to public welfare over private interests, and
- to safety and security over functionality and profitability of their technical solutions.

Engineers, however, are careful not to adopt such criteria or indicators in any dogmatic manner. They seek public dialogue in order to find acceptable balance and consensus concerning these conflicting values.

## 3. Implementation

3.1 Engineers are committed to keeping up and continually developing further their professional skills and competencies.

3.2 In cases of conflicting values, they are expected to analyse and weigh controversial views through discussions that cross borders of disciplines and cultures. In this way they acquire and strengthen their ability to play an active part in such technology assessment.

3.3 In all countries, national laws and regulations exist which concern technology use, working conditions, and the natural environment. Engineers are aware of the relevance of engineering ethics for these laws and regulations.

Many of these laws today take up controversial issues related to open questions in engineering sciences and ethics. Engineers are challenged to invest their professional judgement into substantiating such questions.

Concerning national laws, the sequence of priorities is as follows: national laws have priority over professional regulations, such professional regulations have priority over individual contracts.

3.4 There may be cases when engineers are involved into professional conflicts which they cannot resolve co-operatively



with their employers or customers. These engineers may apply to the appropriate professional institutions which are prepared to follow up such ethical conflicts. As a last resort, engineers may consider to directly inform the public about such conflicts or to refuse cooperation altogether. To prevent such escalating developments from taking place, engineers support the founding of these supporting professional institutions, in particular within the VDI.

3.5 Engineers are committed to educational activities in schools, universities, enterprises and professional institutions with the aims of promoting and structuring technology education, and enhancing ethical reflection on technology.

3.6 Engineers contribute to developing further and continually adapting these fundamentals of engineering ethics, and they participate in the discussions corresponding.

## Fundamentals of Engineering Ethics Summary

- Engineers are responsible for their professional actions and tasks corresponding to their competencies and qualifications while carrying both individual and shared responsibilities.
- Engineers are committed to developing sensible and sustainable technological systems.
- Engineers are aware of the embeddedness of technical system into their societal, economic and ecological context, and their impact on the lives of future generations.
- Engineers avoid action which may compel them to accept given constraints and thus lead to reducing their individual responsibility.
- Engineers base their actions on the same ethical principles as everybody else within society.
- They honour national laws and regulations concerning technology use, working conditions, and the natural environment.
- Engineers discuss controversial view and values across the borders of disciplines and cultures.
- Engineers apply to their professional institutions in case of conflicts concerning engineering ethics.
- Engineers contribute to defining and developing further relevant laws and regulations, as well as political concepts in their countries.
- Engineers are committed to keeping up and continually developing further their professional skills and competencies.
- Engineers are committed to enhancing critical reflection on technology within schools, universities, enterprises, and professional institution.

## 3.5 Spanish Code (General Council of the Official Colleges of the Industrial Engineers)

Approved in the Regional Council's Plenary Meeting, Sept. 17, 2009  
Proposal of deontological code of the Industrial Engineers.

### I. Preamble

The profession of engineer is directly connected with the safety of persons, things and it is its necessary protection. Therefore, logically, it is a collegiate profession. The

consequence is a compulsory responsibility towards third persons that must be considered in a Deontological Code.

The rules of professional deontology herewith enclosed state the obligations that must be respected by the members.

They must be responsible to the public authorities entitled by the law, in behalf of the Colleges, to regulate their professional activities, safeguarding the ethics and the professional dignity, as well as the respect due to the rights of individuals, authorities to which must be added the one of exerting the disciplinary power in professional and collegial field, that since many times is the most characteristic of the Professional Colleges.

As any ethical code, it is based on universal principles such as competence, responsibility, truth, honesty, loyalty, equity and sincerity, that must always be considered even if they are not included in precise regulations.

The last aim of this code is the correct development of the profession of engineer, by giving a wide and positive answer in all fields of activity, as the society demands.

## II. Field of application

The present collection of rules has to be applied by the Industrial Engineers exerting their profession, in forms and ways decided by each Official College of Industrial Engineers.

Man understand that exert his profession so much the Industrial Engineer dedicating himself free and alone to the practice, or in professional association, as the ones working on behalf of third in any of their formality, as the collegiate functionaries.

## III. General obligations of the Industrial Engineer

### 1. Autonomy

In all his intervention the industrial engineer will have to act according to the principles of autonomy and impartiality. He will not accept external pressures, interferences, nor information from third persons that are not checked personally since they might run down or jeopardize the objectivity of his professional activity or the due respect of the rules of his profession.

### 2. Integrity and loyalty

During his professional activity the engineer will have to behave with honesty and diligence and in practice:

2.1 He will have to respect the law system, that is the positive right, the law and the general principles of the right.

2.2 He will not use for his own profit, of his associated or third persons, any resources and preferential information he will get in possession, being this particularly serious for the people whose activity is linked to the public administration or to private or public proceedings of tender.

2.3 He will not accept more commitments or works than he is in a position to carry out in due time for capacity, knowledge and availability of technical means or of

time, and in any case he will respect the rules of competence.

2.4 He will not accept commitments or fees from third persons that can alter his objectivity and independence. His participation to the profits must always be registered in his accountancy.

2.5 He will not delay his services if it is not necessary and he will not use any document as a means of pressure in presence of interests that are not directly connected with the work agreed since the principle according to which the granting of the license cannot be bound to the payment of the due fees must be obeyed.

2.6 After accepting a commitment, he cannot claim lack of time or means, and he will attend to it with dedication using the means necessary to meet the agreements, always except for his right to give up the commitment.

2.7 He will not alter either the content or the professionalism of his services to favour the customer.

2.8 He will avoid to give judgments of value, or damaging opinions that are not based on concrete basis, on professionals or customers; moreover he will be bound to refer to his competent Doyen the torts he might get to know.

2.9 He will not make use of his signature to validate, cover or authenticate works of third not qualified to practice the required professional service, being informed that that behavior can imply a penal or civil offence or a fine.

### 3. Protection of the Society and of the Environment

The Industrial Engineers, among their field of operation, must give absolute priority to the safety, to the health and to the well-being of the Society and of their customers in particular, and always direct their own work to get the best results.

Moreover, with their work, they must contribute to respect the environment and to a bearable exploitation of the natural resources.

### 4. Responsibility

The Industrial Engineer must be aware of the importance that his actions and decisions can have in any moment and be responsible for them in a way coherent with the ethics and technology.

### 4. Loyalty

The Industrial Engineer will take care of the authenticity of his works, opinions, judgments and provisions, both as to the quality and to the quantity, and in any case he will give priority to the principles and to the rules of his profession.

### 5. Publicity

The Industrial Engineer must not give deceptive publicity of his skills and knowledge or experience. Moreover, should he use the communication media he will have to respect the disciplinary rules.

### 6. Know how application

The Industrial Engineer, without reduction of the industrial and intellectual property rights, is obliged to apply his know how and his discoveries in advantage of the community and of the profession, everything, always, in the ambit of the closest loyalty, and without taking possession of ideas, works or collaborations of someone else.

## 7. Remuneration and fees

The engineer will ask for right fees, according to the work to be carried out, without availing himself of advantageous situations and always in relation to the quality agreed and, in any case, respecting the content of the note of appointment, if there is one.

## IV. Incompatibilities

The following incompatibilities are stated (without any prejudice of the ones stated by the law):

1) The cases in which the family, institutional, property relations or relations of any other interest can affect the Industrial Engineer's rectitude and independence;

2) When a work in a public enterprise can interfere with another work in a private enterprise, either on his or a third party's behalf, then there will be incompatibility if it is possible to intervene or to influence in a certain way by taking advantage of the public appointment.

3) The professional activity carried out through Multidisciplinary Companies will have the limits foreseen by the law concerning the Professional Companies, since the engineer is obliged to supervise in any case for the general interest and for the Industrial Engineering's in particular.

4) In matter of Service of Collegial Approval, that must have validity near the Public Administrations, it is established that the Industrial Engineers charged by their Professional College to give the approvals cannot exercise the free profession nor address professional works to obtain the approval with their mediation.

Moreover they would neither be member nor be joined to the firm presenting the project for the approval.

In spite of that, the Government Council of the Professional College can authorize, with justified agreement, an Industrial Engineer charged to give approval to approve a project of which, at first sight, man can deduce the incompatibility.

5) The membership of the Government Council of a College is incompatible with any relation of collaboration, customary or exceptional, of it.

## V. Relations with the customers

The engineer must always have a helpful attitude towards the customer, defending his interests as they were his own.

While practicing his activity, he will act at the highest levels of technical capacity, independence and integrity, optimizing the results obtained according to what has been agreed.

In particular, in respect to the customer he:

1. will not give up maintaining his own best opinion at the customer's benefit;
2. will define clearly the content, the purport, the costs and conditions of his work;
3. will attend to it with dedication using the means necessary to meet the agreements, always except for his right to give up the commitment;
4. will inform he customer about the deviations or external factors that might affect the target of the work agreed;
5. will inform the customer in advance about any eventuality that can cause a variation of his fees as well as of the estimate or note of appointment;

6. he will point out clearly any contribution of third persons for the completion of the work.

## VI. Relations with the Public Administration

The engineer will contribute with his knowledge and experience to all that can improve or correct the technical rules in force.

He must have a fair and loyal behavior in his relations with the Public Administrations proceeding with efficacy and diligence in his management and with honesty in his planning.

## VII. Relations with the Enterprise

The engineer must behave loyally in the enterprise he works for, defending its legitimate interests and collaborating for their realization.

He will look after the discretion about the professional information he gets to know, both directly and indirectly, and will contribute to the improvement and to the application of the law about safety, environment hygiene and work.

## VIII. Relations with the suppliers

The engineer will use the necessary discretion with the suppliers, keeping fair relations that can contribute to improve the quality of the work and services.

He will not take advantage of these relations to alter contents or services that the customer has ordered to him expressly.

## IX. The professional secret

The Industrial Engineer has the duty and the right to keep the professional secret about all the data and information of confidential nature that will be transmitted to him or he will have got thanks to his profession.

The Industrial Engineer shall be free from the above mentioned duty and to operate in accordance with his own conscience, when his silence could cause heavy and irreparable damages to the citizens or to the whole Society. In any case, he could request the collegial aid by his Doyen.

## X. Relations with the professionals

The Industrial Engineer will have to cooperate loyally, with his experience, knowledge and with the discretion involved in the exchange of information with other professionals, to reach the maximum efficiency in the common work.

Practicing his activity, he shall undertake the total responsibility of the partial works and/or services of the several members of his team, excepting for the ones loyally assumed by the other professional.

He shall operate in the field of his professional competence, and he shall inform about the situations which can damage the profession and/or the Society.

He shall maintain relations with other professionals, since the right and the duty of reciprocal respect, and he shall handle objectively their opinions, concerns or complaints. Professional conflicts among Industrial Engineers must be preferably worked out in the ambit of the Profession's Official Colleges by the mediation and the arbitration.

## XI. About the intellectual and industrial property rights

Considering that innovation is fundamental for the profession, any Industrial Engineer is obliged to respect and get the others to respect carefully the rights of property and of conformity with the obligation rights.

## XII. About the early suspension of any professional work, and the succession

In case of an early suspension in the execution of any professional work or service, the Industrial Engineer is bound to communicate any piece of information or circumstance he has got to know during his work that are, or might be, detrimental to the customer, to the society, to a third persons not involved or to the professional that has taken over the work.

Therefore, renouncing to the assumed job, the Industrial Engineer shall communicate the above-mentioned information, in written form, both to the College and to the professional who replaced him.

## XIII. About the civil responsibility

During the development of his professions the Industrial Engineer is bound to the insurance cover for the civil responsibility, sufficient and consistent with the risks taken over in respect to third persons.

## XIV. About the non-fulfillment of the Rules, and the Ethical and Deontological Board

In case of infringement of the deontological rules, the Industrial Engineers will be subjected to disciplinary responsibility accordingly with what would establish the Statutes of the Professional College who must intervene, first of all, for reason of the member's domicile, or, secondly, for the location of his work, so that in any case couldn't be offended the principle that the same action can't be judged twice again. All the Industrial Engineers have to watch for the observance and the fulfillment of this Code, collaborating with the bodies settled for this aim.

## XV. About the professional companies

The deontological regime of the solely Engineering Professional Companies will be the one coming out of the deontological obligations of each members. The causes of incompatibility or disability concerning a member will be extended to the company and to all other members, according to the terms stated by the Law 2/2007, March, the 15, of Professional Companies.

The deontological regime of the Multidisciplinary Professional Companies will be the one resulting from their several professional activities, according to the same terms stated in the previous paragraph.

## XVI. About the kind of infringement and the regime of sanctions.

For the definition of the infringement, the procedure of the disciplinary proceeding and the regime of sanctions, man must conform the dispositions of the special Statutes of the Professional College, and, subsidiary, the dispositions of the General Statutes, and in any case the dispositions of the law 30/1992, November, 26, of the Legal Regime of the Public Administrations, and of the Common Administrative Proceedings, and the RD 1398/1993 of August,4, of Proceedings for the Exercise of the Sanction Power.

Santander, 22 June, 2009



## 3.6 Proposal of the Milan Order of Engineers (Inter-regional deontological code)

### 0. INTRODUCTION

The engineer is aware of his fundamental responsibility concerning the progress of Science and Technology, which are the essential factors for the development of the modern society. (D)

The engineer must have a rigorous behavior owing to the characteristics of his profession; it is always more and more imperative that he must clarify and explicit principles that can be the basis for such a behavior.

Technology, which is more and more developed and powerful, brings great advantages in the daily life, in the development of our society and of the environment, but unfortunately it brings risks of great damages too. Therefore, whereas its complexity makes it rather difficult to be understood and the information power increases, the lack of information can lead the public opinion to exaggerated and unreasonable fears as well as to groundless psychosis.

Consequently, the engineer must take an essential and two-fold role in the society: the first is the subservience of the technology to the good of the human community, with the diffusion of information about its real possibilities and its limits. The second is the evaluation of the advantages and risks involved. (F)

The profession of engineer is directly connected with the safety of persons, things and it is its necessary protection. The consequence is a compulsory responsibility towards third persons that must be considered in a deontological code.

The rules of professional deontology herewith enclosed state the obligations that must be respected by the members. They must be responsible to the public institutions entitled by the law to regulate their professional activities, safeguarding the ethics and the professional dignity, as well as the respect due to the rights of individuals. (S)

The engineer recognizes natural sciences and engineering as important powers shaping society and human life today and tomorrow. Therefore the engineer is aware of his specific responsibility. He orients his professional actions towards fundamentals and criteria of ethics and implements them into practice. The fundamentals suggested here offer such orientation and support for engineers as they are confronted with conflicting professional responsibilities. (D)

As any ethical code, it is based on universal principles such as competence, responsibility, truth, honesty, loyalty, equity and sincerity, that must always be considered even if they are not included in precise regulations.

The last aim of this code is the correct development of the profession of engineer, by giving a wide and positive answer in all fields of activity, as the society demands. (S)

### 1. GENERAL PRINCIPLES

The profession of engineer must be carried out in the respect of the laws of the Country, of the principles of Constitution and the European Community rules.

The profession of engineer is an activity of public interest.

The engineer is a responsible citizen that ensures the link among the sciences, the technology and the human community and he is involved in civil actions aiming at the common good.



The engineer spreads his knowledge and transmits his experience at the service of the society. (F)

Anyone who operate as an engineer, even if he is a citizen of another country, is bound to respect and make third persons respect this deontological code aiming at the safeguard of the dignity of the profession. (I)

## 2. INTEGRITY AND LOYALTY

During his professional activity the engineer will have to behave with honesty and diligence; in practice he will have to respect the law system, that is the positive right, the law and the general principles of the right.

He will not use for his own profit, of his associated or third persons, any resources and preferential information he will get in possession, being this particularly serious for the people whose activity is linked to the public administration or to private or public proceedings of tender.

He will not accept more commitments or works than he is in a position to carry out in due time for capacity, knowledge and availability of technical means or of time, and in any case he will respect the rules of competence. (S)

The engineer carries out the commitments with care and diligence. He will not carry out his professional duties in conditions of incompatibility with his own legal state, or when his own or his customer's interests are in contrast with his professional duties.

The engineer undertakes only the professional commitments he has carried out in first person and or directly; moreover he does not undertake the professional commitments in an equal way with persons that cannot undertake them for the rules in force.

The engineer signs only the professional commitments in a collective way or in group only when the limits of professional competence and responsibility of the single members of the college or of the group are obeyed and specified.

The engineer cannot avail himself of means incompatible with his own dignity to get professional commitments such as the extolling of his own qualities in denigration of the others' or supplying advantages or assurances out of the professional relation. (I)

He will not accept commitments or fees from third persons that can alter his objectivity and independence. His participation to the profits must always be registered in his accountancy.

He will not delay his services if it is not necessary and he will not use any document as a means of pressure in presence of interests that are not directly connected with the work agreed, since the principle according to which the granting of the authorization cannot be bound to the payment of the due fees, must be obeyed.

The engineer will take care of the authenticity of his works, opinions, judgments and provisions, both as to the quality and to the quantity, and in any case he will give priority to the principles and to the rules of his profession. (S)

## 3. AUTONOMY

In all his intervention the engineer will have to act according to the principles of autonomy and impartiality. He will not accept external pressures, interferences, nor information from third persons that are not checked personally since they might run down or jeopardize the objectivity of his professional activity or the due respect of the rules of his profession. (S)

#### 4. RESPONSIBILITY

The engineer is personally responsible for his own work with respect to both the customer and the collectivity. (I)

The engineer must be aware of the importance that his actions and decisions can have in any moment and be responsible for them in a way coherent with the ethics and technology. (S)

The engineer is responsible for his professional actions and the resulting outcomes. According to professional standards, he fulfils his tasks as they correspond to his competencies and qualifications. Engineers perform these tasks and actions carrying both individual and shared responsibilities.

The engineer is responsible for his actions to the engineering community, to political and societal institutions as well as to his employers, customers, and technology users. The engineer knows the relevant laws and regulations of his countries. He honors them insofar as they do not contradict universal ethical principles. He is committed to applying them in his professional environment. Beyond such application he invests his professional and critical competencies into improving and developing further these laws and regulations.

The engineer is committed to developing sensible technology and technical solutions. He accepts responsibility for quality, reliability, and safety of new technical products and processes. His responsibilities include technical documentation as well as informing customers about both appropriate use and possible dangers of misuse of new technical solutions.

They furthermore include:

defining the technical characteristics of such products and processes, suggesting alternative technical solutions and approaches, and taking into consideration the possibilities of unwanted technological developments and deliberate misuse of products and processes.

The engineer orients his professional responsibility on the same fundamentals of ethics as everybody else within society. Therefore the engineer should not create products which are obviously to be used in unethical ways (e.g. products banned by international agreement). Furthermore he may not accept far-reaching dangers or uncontrollable risks caused by his technical solutions. (D)

During the development of his professions the engineer is bound to the insurance cover for the civil responsibility, sufficient and consistent with the risks taken over in respect to third persons. (S)

#### 5. CONTINUOUS PROFESSIONAL DEVELOPMENT

The engineer must improve and update his capability to meet the needs of the individual customers and of the community to obtain the best result related to the costs and the conditions of realization. (I)

The engineer is committed to keeping up and continually developing further his professional skills and competencies.

The engineer is committed to educational activities in schools, universities, enterprises and professional institutions with the aims of promoting and structuring technology education, and enhancing ethical reflection on technology. (D)

#### 6. DUTIES TOWARDS THE SOCIETY AND THE ENVIRONMENT

The engineer is bound to have a correct participation to the life of the community

to which he belongs and he must undertake that the engineers do not bear any pressure that can be detrimental to their dignity. (I)

While developing his activity, the engineer must give absolute priority to safety, health and well being of the society and of his customers in particular; moreover, he will always direct his work to reach the best results. At the same time, he must contribute with his work to respect the environment and to a bearable exploitation of the natural resources.

The engineer is committed to developing sensible and sustainable technological systems. (D)

While practicing his activity and in the limits of his duties, the engineer is bound to avoid to cause environment alterations such as to affect negatively the ecological balance and the preservation of the cultural, artistic, historical goods as well as the ones of the landscape. Moreover, he must aim at the maximum exploitation of the natural resources and at the minimum waste of the energy sources. (I)

The engineer must keep into account not only the whole of legitimate interests he is responsible for in his analysis and decisions but also as the consequences of any type on persons and goods.

He must foresee risks and chances; he tries to get learning from them and to eliminate their negative effects.

The engineer is a source of innovation and motor of progress.

The engineer aims at the best result exploiting all the means available, integrating the human, economical, financial, social and environmental dimensions. (F)

The engineers is aware of the embeddedness of technical systems into his societal, economic and ecological context. Therefore he designs technology corresponding to the criteria and values implied: the societal, economic and ecological feasibility of technical systems; their usability and safety; their contribution to health, personal development and welfare of the citizens; their impact on the lives of future generations. (D)

## 7. RELATIONS WITH COLLEAGUES

The engineer respects loyally the culture and the values of the enterprise he collaborates with, as well as the partner's and customer's ones. He will not act against his professional conscience and he will keep into account the incompatibilities that might occur.

The engineer respects the opinions of his professional partners. He is open and available for any confrontation that may arise. (F)

The engineer must stamp his own professional relations with the colleagues at the maximum loyalty and correctness, with the aim of maintaining a common culture and professional identity even in the different sectors of the profession.

This loyalty and correctness must be extended and required also in respect to other colleagues performing the intellectual professions and in particular the ones having relations with the profession of engineer. (I)

The engineer will have to cooperate loyally, with his experience, knowledge and with the discretion involved in the exchange of information with other professionals, to reach the maximum efficiency in the common work. (S)

The engineer who is called to accept a task already given to another colleague, can

accept it only after the customer has communicated to the previously appointed colleagues the final exemption; moreover he must inform in writing the professional/s he has replaced. (I)

In case of an early suspension in the execution of any professional work or service, the engineer is bound to communicate any piece of information or circumstance he has got to know during his work that are, or might be, detrimental to the customer, to the society, to a third persons not involved or to the professional that has taken over the work.

He will avoid to give judgments of value, or damaging opinions that are not based on concrete basis, on professionals or customers; moreover he will be bound to refer to the competent institutions the torts he might get to know. (S)

## 8. RELATIONS WITH THE CUSTOMER

The relation with the customer must be based on trust and must be stamped at the utmost loyalty, clarity and correctness. (I)

The engineer must always have a helpful attitude towards the customer, defending his interests as they were his own.

While practicing his activity, he will act at the highest levels of technical capacity, independence and integrity, optimizing the results obtained according to what has been agreed.

After accepting a commitment, he cannot claim lack of time or means, and he will attend to it with dedication using the means necessary to meet the agreements, always except for his right to give up the commitment.

He will not alter either the content or the professionalism of his services to favor the customer. (S)

The engineer must clearly define in advance with the customer the contents and the terms of the professional duties he has accepted in the respect of this code.

In the relations with the customer, either private or public, the services must be paid according to the rules in force.

The engineer cannot accept from third persons any fees, direct or indirect, apart from the ones due to him by the customer without communicating to him the type, reason and amount and without receiving a written authorization for the payment.

Moreover, should the engineer have any personal interests on materials or building procedures proposed for the works ordered to him, he must inform the customer about the type or the presence of those relations that might cause a suspect of professional partiality or a violation of ethical rules.

The engineer will ask for right fees, according to the work to be carried out, without availing himself of advantageous situations and always in relation to the quality agreed and, in any case, respecting the content of the note of appointment, if there is one. In particular, in respect to the customer he:

- will not give up maintaining his own best opinion at the customer's benefit;
- will define clearly the content, the purport, the costs and conditions of his work;
- will inform the customer about the deviations or external factors that might affect the target of the work agreed;
- will inform the customer in advance about any eventuality that can cause a variation of his fees as well as of the estimate or note of appointment.

He will point out clearly any contribution of third persons for the completion of the work. (S)

## 9. RELATIONS WITH THE COLLABORATORS:

The engineer will behave with loyalty and equity in respect to his collaborators, without any discrimination. He will encourage them to develop their skills and to grow in their professions. (F)

## 10. RELATIONS WITH THE SUPPLIERS

The engineer will use the necessary discretion with the suppliers, keeping fair relations that can contribute to improve the quality of the work and services. He will not take advantage of these relations to alter contents or services that the customer has ordered to him expressly. (C)

## 11. RELATIONS WITH THE ENTERPRISE

The engineer must behave loyally in the enterprise he works for, defending its legitimate interests and collaborating for their realization.

He will look after the discretion about the professional information he gets to know, both directly and indirectly, and will contribute to the improvement and to the application of the law about safety, environment hygiene and work. (S)

## 12. RELATIONS WITH THE PUBLIC ADMINISTRATION

The engineer will contribute with his knowledge and experience to all that can improve or correct the technical rules in force.

He must have a fair and loyal behavior in his relations with the Public Administrations proceeding with efficacy and diligence in his management and with honesty in his planning. He will denounce to the Administration all those situations or facts that can affect the respect of the law and of the professional ethics in the limits of his competence. (S)

In all countries, national laws and regulations exist which concern technology use, working conditions, and the natural environment. The engineer is aware of the relevance of engineering ethics for these laws and regulations.

Many of these laws today take up controversial issues related to open questions in engineering sciences and ethics. The engineer is challenged to invest his professional judgment into substantiating such questions.

Concerning national laws, the sequence of priorities is as follows: national laws have priority over professional regulations, such professional regulations have priority over individual contracts. (D)

The fiscal evasion in the professional field is considered as a disciplinary infringement, provided that it has been assessed. (I)

## 13. ABOUT THE PROFESSIONAL SECRET

The engineer has the duty and the right to keep the professional secret about all the data and information of confidential nature that will be transmitted to him or he will have got thanks to his profession. (S)

## 14. ABOUT PUBLICITY

The engineer must not give deceptive publicity of his skills and knowledge or experience. Moreover, should he use the communication media he will have to respect the disciplinary rules. (S)

Being understood that the comparative or denigrating publicity is forbidden, he is allowed anyhow to advertise about his qualifications, his professional specializations,



the characteristics of the service offered and the criteria to determine the fees of the services and the costs. The distorted use of the advertising instrument and the violation of limits and principles herein pointed out must be considered illicit. (I)

#### 15. ABOUT THE INTELLECTUAL PROPERTY RIGHTS

Considering that innovation is fundamental for the profession, any engineer is obliged to respect and get the others to respect carefully the property rights. (S)

#### 16. CONFLICT

In cases of conflicting values, the engineer is expected to analyze and weigh controversial views through discussions that cross borders of disciplines and cultures. In this way he acquires and strengthens his ability to play an active part in such technology assessment.

There may be cases when the engineer is involved into professional conflicts which he cannot resolve co-operatively with his employers or customers. This engineer may apply to the appropriate professional institutions which are prepared to follow up such ethical conflicts. As a last resort, he may consider to directly inform the public about such conflicts or to refuse co-operation altogether. To prevent such escalating developments from taking place, he supports the founding of these supporting Professional Institutions. (D)

In the case of conflicts of professional moral between entrepreneurs and customers the engineer must look for institutional supports putting legal questions. In particular cases the engineer can apply to the authorities or can refuse to continue the collaboration. To prevent such conflicts the engineer fosters the setting up of suitable institutions. (D)

#### 17. INCOMPATIBILITY

The following incompatibilities are stated (without any prejudice of those stated by the law):

- the cases in which the family, institutional, property relations or relations of any other interest can affect the engineer's rectitude and independence;
- when a work in a public enterprise can interfere with another work in a private enterprise, either on his or a third party's behalf then there will be incompatibility if it is possible to intervene or to influence in a certain way by taking advantage of the public appointment.

The professional activity carried out through Multidisciplinary Companies will have the limits foreseen by the law concerning the Professional companies, since the engineer is obliged to supervise in any case for the general interest and for the engineering's in particular. (S)

Incompatibility conditions are chiefly recognized in the following cases:

- appointment as a judge in a competitive examination to which another professional takes part as a competitor (or viceversa) having relationship links or a professional permanent collaboration with the first, or anyhow having relations that can endanger the objectivity of the judgment;
- having interests in the enterprises that are competitors in respect to the one that presents a project to be approved, or having interests in the enterprise presenting the project to be approved;
- abuse, direct or through a third party, of the powers related to his appointment to get advantages for himself or for others;
- practice of the free profession in contrast with specific rules that forbid it and wi-



thout authorization of the competent authorities (in the case of subordinate engineers, administrators, etc.)

- collaboration, under any form, to the planning, building, installation, modifications, repair and servicing of plants, machinery, devices, equipment, buildings and structures for which the engineer receives the task for the homologation, testing or periodical surveys aiming at the safety.

- it being understood all that provided by the state or regional measures on this subject, the engineer that writes or has written a regulating plan, a plan of manufacturing or other urban instruments of public initiative and the long term program of realization, must refrain from accepting from private customers professional tasks of projecting concerning the area of the urban instrument, starting from the moment of appointment up to the approval.

- this rule must be applied also to those professionals that have a permanent relation of collaboration with the author of the plan.

There is also incompatibility in contrast with the engineer's duties such as:

- in the participation to competitive examination whose conditions have been considered detrimental to the engineer's rights and dignity, provided that a formal warning has been issued and that the same has been communicated by writing to the candidates in due time;

- in the submission to the customer's requests that can contravene laws and rules in force. (I)

## 18. THE PROFESSIONAL COMPANIES

The professional services, even if interdisciplinary, can be supplied to the users in an associative or company form in the ways and in terms in force.

The professional services must be given under the direction and responsibility of one or more associates /members whose names must be communicated to the customer in advance. (I)

The deontological regime of the engineering professional companies will be the one coming out of the deontological obligations of each members. The causes of incompatibility or disability concerning a member will be extended to the company and to all other members, according to the terms stated by law. (S)

C= SPAIN D = GERMANY F=FRANCE I= ITALY

## 4 CONCLUSIONS

*Today, in the context of a work environment that has become ever more complex, it is vital to fix a series of deontological principles to which to adhere in the course of activities connected with the profession and, therefore, geared towards providing guidance on correct professional behaviour.*

*This is even more so in the case of the profession of engineers who, often more than others, have to continually engage in evaluations and confront the decisions consequent upon them. A deontological code for engineering, then, is particularly necessary and, given the current complexity of international relations, it is important that it extend beyond national borders. The importance that an ethical code assumes in engineering is also testified to by the large number of academic contributions to discussion on the topic, presented and debated in international conferences dedicated to engineering education. This study, which centres on a number of general considerations in relation to ethics and on a broad analysis of the relevant literature, constitutes one proposal in this direction. Any comment or observation on the part of colleagues, whether Italian or from other countries, will be extremely useful and in the interest of a shared general proposal.*

Alberto Caleca

## Bibliography

- [1] card. C.M.Martini “Discorso al Collegio degli Ingegneri di Milano” 17.12.1985
- [2] E. Rovida “Spunti di etica della progettazione” *Progettare* 118 , 10 (1997)
- [3] M.Pera “Per una filosofia della verità e della sicurezza” *Rivista IBM* 2(1978)
- [4] M.Torchio “La bioetica, un ponte per la sopravvivenza” *Soc. It. Sci. Nat.* 65(1974)
- [5] I.van de Poel, L. Royakters “Ethics, Technology and Engineering” Wiley Blackwell, 2011
- [6] J.Rowan, S.Zinaichi jr, “Ethics for the professions” Wadsworth, 2003
- [7] V.A.Lofthouse, D.Lilley “Teaching Ethic in Design: a Review of Current Practice” International Conference on Engineering Design ICED2009, Stanford, 24-27 August 2009.
- [8] C.E.Harris, M.S.Pritchard, M.J.Rabins “Engineering Ethics” Wadsworth, 2009
- [9] G.A.Ybarra “Ethics in Engineering Education Worldwide” 28th Int.Symp. IGIP 1999
- [10] V.I.Solntsev “The Engineering Ethics Course Design for Lifelong Engineering Education” 30th Int. Symp. IGIP 2001
- [11] A.Can Ozcan “ Ethics in Industrial Product Design (Good, Goods and Gods)” Int.Des.Conference DESIGN 2002, Dubrovnik, 14-17 May, 2002
- [12] G.F.Biggioggero, E.Rovida “Professional Deontology of Teachers in Technical Fields” 33th Int. Symp. IGIP in cooperation with IEEE/ASEE/SEFI
- [13] N.S.Nandagopal “Tools for Teaching Engineering Ethics” 33th Int. Symp. IGIP in cooperation with IEEE/ASEE/SEFI
- [14] J.P.Domschke “Kompetenz als Ethische Forderung in Ingegneurberut” 34th Int.Symp. IGIP 2000
- [15] V.I.Solntsev “Engineering Ethics Contributes to Engineering Padagogics” 29th Int. Symp. IGIP
- [16] I.Lebowits “ Die Rolle der Ethik in der Ingenieurausbildung und Ingenieurberuf” 8th Int. Symp. IGIP 1989
- [17] M.W-Martin, R.Schinziger “Ethics in Engineering” McGraw-Hill, 2005.
- [18] Enea Domizio Ulpiano “Regole”
- [19] A.Pappagallo, C.Porcari, E.Rovida “Un’esperienza sulla prova delle quattro domande” *Rotary* 2040 3(marzo 2011)

# DEONTOLOGY

note

note

# **DEONTOLOGY**

**[www.ordineingegneri.milano.it](http://www.ordineingegneri.milano.it)**