**INTRODUCTION OF PREVENTION ENGINEERING IN MECHANICAL ENGINEERING CURRICULUM**

**(Abstract of the Technical Presentation)**

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In the fast growing world the economy, but especially technology and production are developing very rapidly. The engineering design that should predict the results of this development and equip the society with tools for steering and controlling them, plays very significant role. Fast developing technology brings much benefit to humanity and makes life easier and more comfortable. At the same time it creates traps and dangers and may bring harms. Inventions of Alfred Nobel, Samuel Colt and Eliphalet Remington as well as nuclear research brought significant amount of progress but also much harm. These harms stroked individuals and societies. The role of engineering design is to predict these harmful actions, neutralize or eliminate them or even change them into friendly components. Such action follows exactly the way recommended by BTIPS (Brief Theory of Inventive Problem Solving) especially by the module Prediction. This module recommends building a hierarchy of components. When developing Prevention/Preventative Engineering the hierarchy of the systems should be described and the contents of modules defined. These can be named as: mega-system, super-system, systems, sub-systems, elements and items. The contents of these components should be defined. For example a transportation system could be defined as collection of sub-systems such as: air-transport, ground, under-ground, water and underwater transportation systems. All those systems should be design in such a way that harm to humans and nature should be prevented. The means and approach to such design and production should be described in form of rules, recommendations and sometimes strict norms. The recommendations for introducing Prevention/Preventative Engineering in education are proposed in this presentation and some examples developed in scope of the Senior Design, Elements of Machine Design and other courses are quoted. For examples of personal equipment to protect groups and individuals as designed by Senior Design engineering students are described. The recommendations for teaching design are quoted. The necessity of research and some recommendation for directions of research in Prevention/Preventative Engineering are given.

On every step of our lives we face necessity of preventing harms and destruction that can be done by the surrounding world. In this paper the method of protecting humans living and operating in the surrounding world. The preventing actions can connect to BTIPS - Brief Theory of Inventing Problem Solving.

This paper follows some statements of IMECE 2011-62293 “Solving Problems with Contradictions – The Challenge of 21st Century Engineering Education, Research and Practice”. There are several origins from which Prevention/Preventative Engineering should emerge. First, it comes from our normal life, where the positive actions of humans are threatened by some unfriendly dealings of nature. Second, it is created by the technology itself, by developments that are supposed to make human life easier but may be dangerous in application. Third, it comes from the hostile actions performed unintentionally or intentionally by other humans. To define and formulate Prevention/Preventative Engineering as a Branch of Engineering, to perform the research to build up this branch and introduce it in the engineering teaching curriculum, is the necessity of our times

Key words: Technology development, harmful influence of technology, harmful actions of environment, harmful actions of nature, intentional and unintentional harmful action of humans, Prevention/Preventative Engineering.