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ERRORS AND ACCIDENTS IN THE WORKPLACES

UDK 159.942:331.45
 RECEIVED: 2014-01-27
 ACCEPTED: 2015-02-02

SUMMARY: Errors are unavoidable in the work environment. Accidents result from human errors and system errors causing unexpected harm and damage. Work-related accidents incur huge losses in terms of life and property. There are various theories of accident causation. Some attribute accidents to human causes, and others to system and management lapses. Some people, because of unawareness, complacency or recklessness, are more prone to errors than others even when exposed to equal number of risk factors. Cognitive overload and other behavioral and moral problems also may cause errors and, thus, accidents. In groups, people may succumb to groupthink and may develop an illusion of invulnerability, as was the case with the Titanic and the Challenger disasters. The government should effectively enforce health and safety laws in workplaces. The management can play vital role in reduction of errors and accidents. It can deploy psychologists to minimize or reduce error and accident rates. Safety training is also of essential importance in modern work environments. Sick buildings are to be corrected by the management as soon as the hazards come to notice.

Key words: errors, accidents, human errors, illusion of invulnerability, stress, stressors, organizational stress, cognitive overload, risk factors, safety, occupational health

CONCEPT OF ACCIDENT

Generally, accidents cause harm and injury, loss of life and disability. In Japan, Karoshi (*De-Cenzo & Robbins, 2010*) means death due to overworking. Annually more than 10,000 die because of Karoshi in Japan. Some accidents may not cause harm but they teach us important lessons. Accident is an unplanned and uncontrolled event in which the action or reaction of an object, substance, person or radiation results in personal injury or the probability thereof (*Mansor, Zakaria, & Abdullah, 2011*). Without calamities, incidents, near misses, and "free lessons," we have no way of uncovering recurrent

error traps. If someone has an accident, something unpleasant happens to them that was not intended, sometimes causing injury or death (*Sinclair, 2001*). It is a situation in which someone is injured or something is damaged without anyone intending them to be (Longman Dictionary of Contemporary English). Hazardous exposures, workplace and process design, work organization and environment, economics, and other social factors cause accidents (*Jovanovic, 2004*). When something regular was intended, but unknowingly the unfortunate and unintended results show up, the situation is an accident. Accidents happen accidentally. Accidents do not blow the trumpets before happening.

Jovanovic (*2004*) defines occupational accident as "an unexpected and unplanned occurrence, including acts of violence, arising out

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of or in connection with work which results in one or more workers incurring a personal injury, disease or death." In the workplace, accidents can range from minor injuries to serious burns and scalds, skeletal damage and death. Occupational accidents cause frequent loss of life, pain and suffering, lost wages for the injured workers, and damage to production facilities and equipment (*Jovanovic, 2004*). Accidents result from the interaction of work environment, training, and employee factors (*Murphy, DuBois, & Hurrell, 1986*). In chemical industries, there may be the danger of accidental poisoning, lead poisoning, chemical burn, acid burns, inhalation of chemicals and so forth. Nuclear meltdowns are the most dangerous forms of accidents seen. Chernobyl, Three Miles Island and Fukushima meltdowns still chill the spines of all the dwellers of this earth.

There are mental impacts of occupational injuries. Post-traumatic stress disorder, mood disorders, changes of emotional state, cognitive and psychosocial disabilities are the most common consequences of occupational accidents (*Jovanovic, 2004*). Mental problems such as stress, burnout and wear out, depression and suicides are grave issues associated with occupation. However, they very often go unnoticed. There are physical impacts too, in the form of minor and major injuries. Certain industries such as mining, agriculture, forestry and construction have high rates of fatal accidents (*Jovanovic, 2004*). There are many hazards in agriculture. Unique features of agricultural workplace, unprotected people, wide range of activities, dispersed workplaces, seasonal workforce that often has brief contracts, and poor skills combine to increase risk for occupational injuries (*Jovanovic, 2004*). The most common injuries include fractures, bruises, lacerations, contusions, penetration by foreign bodies, and sprains or strains. The current health and safety issues in the workplace are workplace violence, indoor air quality (smoke-free environment), and repetitive stress injuries (musculoskeletal diseases), among others (*DeCenzo & Robbins, 2010*). Common in the latter group is the carpal tunnel syndrome, a repetitive-motion disorder affecting the wrist.

CAUSES OF ACCIDENTS IN WORKPLACES

Unhealthy work environment is also called sick building. It may contain airborne contaminants from office machines, water-damaged building materials, carpets and furnishings, cleaning products, construction activities, perfumes, cigarette smoke, latex products, insects, air fresheners, microbial growth (fungal/mold and bacterial), and outdoor pollutants (*DeCenzo & Robbins, 2010*). Negligence, the lack of training and awareness, alcohol consumption, drug abuse, depression, complacency, poor and ergonomically unsound equipment, lapses in the system, the pitfalls of design and engineering, etc. can constitute the causes of accidents. There are various causes of accidents such as stress and fatigue, unsafe acts, machinery and tools, workplace design, and training procedures (*Mansor et al., 2011*). Workplace accidents are one of the crucial issues that occur in the organization, especially for companies or industries that in their daily operations use machinery at the workplace (*Mansor et al., 2011*). Factors relating to individuals (e.g. drivers and pedestrians), the nature of the job (e.g. design of the workplace and vehicle), and the organization (e.g. training procedures and management systems) (*Mansor et al., 2011*) may be the causes of accidents.

The following can be listed as the major causes of accidents:

- **Stress:** Murphy et al. (*1986*) say stress plays a contributing role in workplace accidents. This is the adverse reaction a person has to excessive demands. Demands at work include working long hours, workload demands, and supervisory pressures. Overwork (and underload of work), deadline pressures, role stressors, underutilization of abilities, and physical discomfort have been identified as work factors associated with increased stress symptom reporting (*Murphy et al., 1986*). Stress symptom activity causes decrease in worker capabilities, and it increases accident risk. Murphy et al. give the model of stress and accident relation as depicted in Figure 1.

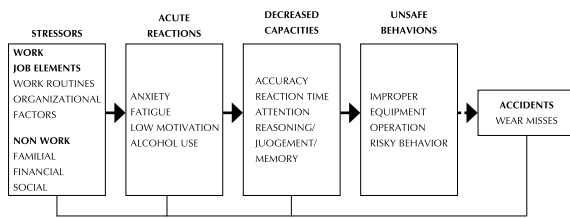


Figure 1. Model of stress and accident

Slika 1. Model stresa i nesreća

Stress can be caused by factors called stressors, which are of two types: personal and organizational as shown in Figure 2 (DeCenzo & Robbins, 2010). Stress from each source affects performance in the other.

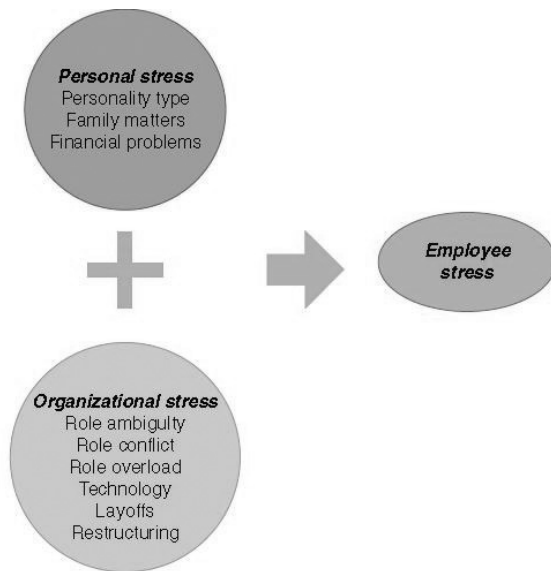


Figure 2. Employee stress

Slika 2. Stres kod zaposlenika

- **Fatigue:** It is weariness or exhaustion from labor, exertion, or stress. The causes of fatigue include psychological stresses, such as loss or bereavement; and social stresses, such as problems at work. Errors are more likely to occur when workers have high levels of fatigue or during times of inflexible or overly demanding work schedules (Mansor et al., 2011). This can lead to loss of concentration.
- **Unsafe act:** It is a human action that departs from hazard control or job procedures to which the person has been trained

or otherwise informed, which causes unnecessary exposure of a person to hazards. Violation of rules comes as a cause. In violation, the age factors matter. Teenagers, by illusion of invulnerability, and adults, by sense of resentment against the management, become careless.

- **Machineries/tools:** Frequency of accidents reduces with the use of machineries, but accidents tend to be more severe because of this. The worn out tools and old machines can be the causes of accident.
- **Design of work place:** Poor design and layout of workplaces must be seen as a causal factor. Once a dangerous layout is created, it is much more difficult to correct (Mansor et al., 2011). Physical discomfort has been shown to be associated with worker distress and job dissatisfaction (Murphy et al., 1986).
- **Training procedures:** Many workplace transport accidents are associated with poor training (Mansor et al., 2011). Management support is needed to create workplace safety climate. The role of training in preventing accidents is great. Skills for doing the job diminish over time, so occasional refreshment is necessary.
- **Lack of awareness:** Lack of knowledge and unawareness cause some accidents. The farmers in Nepal are not aware of the detrimental effects of pesticides and insecticides on their health. Merely wearing gloves, masks and safety glasses or goggles would prevent many accidents.
- **Moral weakness:** Not abiding by the law and not obeying the rules and regulations can cause accidents. Deviant workplace behaviors sometimes invite errors and, hence, accidents. Despite knowing the dangers, sometimes workers fail to wear personal protective equipment (PPE). In two French studies, alcohol was involved in 10% of all industrial accidents (Murphy et al., 1986). Alcohol weakens intellectual and perceptual function causing impaired physical coordination, slow reaction time (RT), blurred vision, and faulty judgments. Problem drinking is a psychiatric problem

growing out of tension, anxiety, and frustration, which may have their origin in the workplace itself.

THEORIES OF ACCIDENTS

Domino theory states that all accidents can be modeled by a chain of five factors: i) ancestry and social environment, ii) fault of a person, iii) an unsafe act or physical hazard, iv) an accident and v) the resulting injury (*Mansor et al., 2011*). It is called domino because each factor actuates the next step in the manner of falling dominoes lined up in a row (*Jovanovic, 2004*). Multiple causation theory states that for an accident to happen, there are multiple contributory factors and causes. Contributory factors can be categorized as the behavioral and environmental. Hazardous work conditions, organizational factors (e.g. poor management, careless and fussy offices), and inadequate training each contribute to accident hazard (*Murphy et al., 1986*). Although hard to define, there are imminent danger situations in the workplace. According to DeCenzo and Robbins (*2010*), imminent danger is a situation where an accident is about to occur. There are many other theories of accident causation.

Theory A: Individual errors

This theory focuses on the errors of individuals, blaming them for forgetfulness, inattention, or moral weakness (*Reason, 2000*). Blaming individuals is emotionally satisfying. It is prevalent in medicine. In Britain and some other societies, it is easier to blame the individual rather than finding faults in the technology or system. Safer healthcare institutions cannot be imagined if the person approach is to thrive. A weakness of person approach is in that it isolates unsafe acts from their system context. Spahr and Escolas (*1982*) state that the age of the driver, the driver's sex, and an estimate of the relative seriousness of the accident using a combination of property damage and personal injury, including death, are the variables used by insurers to analyze the payability. They point out that the arresting officer has no skill or makes no effort to differentiate between drivers who were violating and who were not violating traffic laws at the time of the

accident. Accident frequency and severity have been analyzed with respect to driver characteristics of age, sex and territory or geographical area by the insurance companies (*Spahr & Escolas, 1982*). Risky behavior means various actions carrying a risk of negative results, for the physical and mental health of an individual and the social group (*Tokarczyk, Uciska, & Niezgoda, 2011*). So a traffic member on the road is a direct and his relatives are indirect prospects of accidents.

The person is at the focal point of accident causation according to this approach.

Theory B: System errors

This model concentrates on the conditions under which individuals work and tries to build defenses to avert errors or mitigate their effects (*Reason, 2000*). Errors are the consequences, not the causes, according to this approach. Even the best people may commit the worst mistakes. Mishaps in the industries happen recurrently, rather than randomly. The error provoking properties within the system should be identified to minimize errors and accidents. Active failures are caused by persons in direct contact with the system. They can be slips, lapses, fumbles, mistakes, and procedural violations. Latent conditions are 'resident pathogens' within the system. Identification of these conditions can be the proactive rather than reactive risk management. Because occupational risks and environmental spillovers arise from the same system transformations, work accidents provide warning of broader environmental problems (*Olson, 1979*). Person, workplace, social economy and earth are ecologically linked and in constant interaction. Each smaller unit forms a subsystem of a larger one in the economy, and each has inputs from and outputs to the other. Many types of problems can be known in the connection of workplaces with other systems: (1) acceleration of exchanges; (2) spatial isolation in the system; and (3) influences of gravity. This constitutes the ecology of risk (*Olson, 1979*). In terminal accidents the three kinds of problems are often found in combination.

To err is human, the saying goes. The totality of faults and holes inherent in the design or management is the cause of accident.

Accident proneness

Certain individuals are always more likely than others to sustain accidents, even though exposed to equal risks (Froggatt & Smiley, 1964). The term was coined by psychological research workers in 1926. Hypothesis of accident causation states that a person's accident liability may vary from one time to another (Froggatt & Smiley, 1964). What are called accidental deaths are often the result of negligence, wilfulness or rashness, it is assumed. Varying individual susceptibility to accident is an important factor in determining the accident frequency distribution. This as a concept of cause of accident is challenged. Accident proneness, as measured by the accident record, changes with time. The permanently accident prone comprise only a very small proportion of those persons with an unsatisfactory accident record in any one observation period. Accident proneness is not a stable entity (Froggatt & Smiley, 1964) but varies for each person from time to time. Accident proneness as an operational concept has proved hopeless (Kuné, 1985). Kuné (1985), defining the accident proneness as a personal idiosyncrasy predisposing the individual who possesses it in a marked degree to a relatively high accident rate. He adds that accident proneness is a relatively stable and personal characteristic that inclines some workers to have a higher accident rate than others, although all workers are open to equal risk.

Characteristics of the accident prone individual are lack of education and awareness of potential hazards, moodiness of temperment, inattention, psychomotor retardation, and low intellect (Murphy et al., 1986).

Accident liability

An accident may be conceived as a condition of liability, i.e. as an event subject to and contingent on the existence of recognizable events (Kuné, 1985). Such events are categorized into

factors within and outside the person or individual. Factors within an individual are intellectual and physical capacities, fatigue, illness, level of education and training. Factors outside an individual are characteristics of the sociotechnical environment for example, the company, the firm, the workplace; quality of the maintenance, safety measures, instruction, or communication. Evidently there is interaction of the sociotechnical environment, the personal attitude and the accident liability. Kuné (1985) makes it clear with the figure shown here:

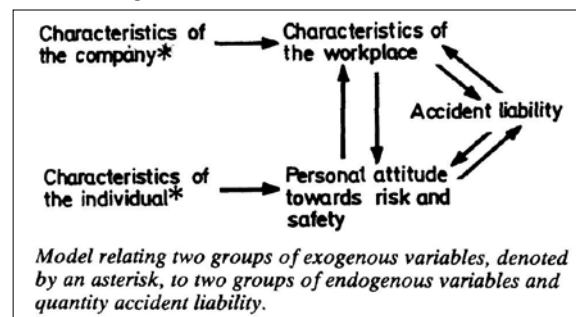


Figure 3. Model as described by Kuné (1985)

Slika 3. Kunéov model (1985)

Human error

Human fallibility problem can be looked at in two ways. The person approach is one, and the system approach is the next (Reason, 2000). The person approach gives priority to the hazardous acts - errors and procedural violations - of people at the sharp end like nurses, physicians, surgeons, anesthetists, pharmacists, etc. Reason (2000) says the errors result from aberrant mental processes such as amnesia, inattentiveness, poor motivation, recklessness, negligence, forgetfulness and carelessness. The just world hypothesis maintains that people get what they deserve and deserve what they get. People may see human errors as a moral issue and think that bad things happen to bad people. As an example, highly educated university students may condemn preys of poverty as "lazy and no good," while rejecting proof showing them to be victims of socioeconomic powers beyond their control (Tomaka, 2004). While watching the movie we may expect the antagonist to be punished. We

need to assume that life is fair, that the world is well-ordered, and that we have control over our environment, because to think otherwise would cause much cognitive dissonance (*Kasschau, 2003*). This is the just world bias. It may make us prejudiced against those who suffer bad luck. The human factor theory of accident causation ascribes accidents to a sequence of events ultimately caused by human error.

The role of human error in accidents and failures cannot be overlooked. In spite of terrorist bombs and structural failures, human error on the flight deck continues to account for the majority of aircraft accidents (*Green, 1990*), for example. He says that commercial pilots have average intelligence and aptitude. He asks, 'If safety does not appear to stem from the intrinsic quality of the pilots, what is its source?' Two main factors are there for safeguarding the flying from human error. 1) Commercial flying has become extremely regulated and 'proceduralized', and 2) the training and competency checking of airline pilots is strict.

The reasons for human error are workers' unawareness, inadequate working procedures, lack of training, excessive use of overtime or shift work, sick buildings, drug abuse at work, etc. (*Prevention of major industrial accidents, 1991*).

Illusion of invulnerability

This is the term related to the groupthink. Members ignore obvious danger, take extreme risk, and are overly optimistic (*Janis & Mann, 1977*). They feel they cannot fail. The workers, even when involved in dangerous and risky environments, may think they are immune to injury and accidents. This happens as the job becomes routine. They are automated by over-routinization and think are impregnable. But a slip may be enough for workers to be eaten by beastly ruthless machines. Until he contracts a disease, man takes his health for granted. This metaphor is applicable in the workplaces. Age factor also can be considered. The illusion of invulnerability - "Others may get caught, but not me!" - is a part of adolescent egocentrism (*Kasschau, 2003*).

While working in a group, the idea of 'risky shift' in group decision making (that a group is likely to make a more risky decision than the average member) may come up. The teenage workers or relatively younger workers may possess the illusion of invulnerability because of the age factor. In teenagers the accidents can be traced to rebellion or resentment against authority (*Berkeley, 2000*). Groups stricken with groupthink assume themselves to be the best, which in turn causes them to lose touch with reality. This will lead to too much optimism and risk-taking. This is a case of *group overconfidence*.

The sinking of the Titanic in 1912 was the result of the illusion of invulnerability. So was the Challenger disaster of 1986 (*Myers, 2001*) in which seven astronauts were killed. The captain, the crew, the designers and builders of the Titanic thought the ship was unsinkable. This accident claimed the lives of 1500 passengers and ship personnel.

However, the sense of psychological invulnerability is not always bad. It may help bolster the self-esteem and self-efficacy.

Cognitive overload

Present age has been the age of multitasking. Workers at the desk deal with clients, the computer, the telephone and the social networks all at the same time. The role of attention is to prevent the cognitive overload by controlling the extent of information into the span of attention or consciousness (*Groome, 1999*). Performance may be negatively affected due to cognitive overload. This is the state when work task is beyond the cognitive ability of the worker. President Nixon was particularly miserly with his cognitive efforts when overwhelmed by a relentless series of domestic and foreign crises. By his own account, this cognitive overload contributed to the mistakes that led to his fall from power (*Kenrick, Neuberger, & Cialdini, 1999*).

Workforce diversity is commonplace these days. Social support is an important aspect of work life. Organizational members who are prejudiced or lack experience with dissimilar others and who find themselves in a diverse workplace may experience cognitive overload (*Gelfand,*

Nishii, Raver & Schneider, 2005) as they endeavor to monitor their behavior and simultaneously engage in complex work tasks. So management has to play a positive and proactive role to reduce discrimination and prejudices in the work places.

Those who are higher in mindfulness seem to be victim to fewer cognitive failures (*Leary, Adams, & Tate, 2010*) that echo cognitive overload, such as failing to recall names, having trouble making decisions, or forgetting appointment times, forgetting the procedures, perplexing and being blank for no other apparent reasons. The IO psychologist can think of ways to increase mindfulness in the workers.

Danger of cognitive overload is increased when athletes become thoughtful about winning a competitive encounter (*Moran, 2006*). They may find themselves torn between trying to focus on performing an action and worrying about the possible result of the contest in which they are partaking.

Solutions for errors

Reason (2000) says that errors, as seen in the human approach, can be solved by reducing unwanted variability in human behavior. He further suggests appealing to people's sense of fear and adopt disciplinary measures, threat of litigation, retraining, naming, blaming, and shaming or writing other procedures.

The system approach to errors seeks to solve the problem by changing the conditions under which humans work, even though we cannot change the human condition. When an accident occurs, the important issue is not who made the mistake, but how and why the defences failed. System defense remains a central idea. Failures can be contemplated as learning experiences.

Errors are to be investigated and they teach lessons. So probing into past or historical accidents is a good way to prevent future accidents. Even though the errors are not always considered the causes of accident, they are to be officially investigated (*Green, 1990*) so that the organization can learn where the loopholes are. Another psychological solution to error is the setting up

of a reporting system that permits any worker to report her own everyday errors (*Green, 1990*). The latter system according to *Green (1990)* has got the clear benefit of gathering error data unspoiled by considerations of guilt, and sometimes permits system correction before the occurrence of accidents. Effective risk management relies on the formation of the reporting culture. Some form of confidential reporting system (*Green, 1990*) for human error may be adopted. It was the absence of this reporting culture that made it possible for the Chernobyl disaster to occur.

Allowing rest and sleep during the breaks or after continuous working for some hours can be an effective solution. Some organizations adopt cat naps. Fatigue has been determined to be a cause of accident or error, so rest is a relief, indeed.

Reducing accidents and promoting safety behaviors

Prevention of occupational injuries is a vital job for human resource management (*Jovanovic, 2004*). High reliability organizations expect to make errors and train their workforce to recognize and recover them. They incessantly rehearse familiar scenarios of failure and strive hard to imagine novel ones. Instead of isolating failures, they generalize them. In place of making local repairs, they look for system reforms (*Reason, 2000*). They are the major examples of the system approach. For these organizations, the hunt for safety is not so much about thwarting isolated failures, either human or system, as about making the system as robust as is practicable in the face of its human and operational risk factors.

Unsafe acts ought to be closely monitored (*Mansor et al., 2011*). Occupational Safety and Health Act (OSH Act) of 1972 radically altered HRM's role in ensuring that physical working conditions meet enough standards in US. The enforcement of such laws makes a profound impact. American employees can notify the authorities about workplace hazards, request for inspection of workplace and file a complaint if workplace is deemed unsafe. A hazard is a physical situation with a chance for human injury, damage to property, damage to the environment or

some combination of these (*Prevention of major industrial accidents, 1991*).

When performing risky tasks workers should be fully equipped with PPE such as eyewear, safety boots, gloves and glasses (*Mansor et al., 2011*).

Engineering controls, protective equipment and technologies, management commitment to and investment in safety, regulatory controls, and education and training (*Jovanovic, 2004*) can be the controlling techniques of the accidents.

In the words of DeCenzo and Robbins (*2010*), "A company can help prevent workplace violence by ensuring that its policies are not adversely affecting employees, by developing a plan to deal with the issue, and by training its managers in identifying troubled employees. Creating a healthy work site involves removing any harmful substance, such as asbestos, germs, mold, fungi, cigarette smoke, and so forth, thus limiting employee exposure."

ROLE OF PSYCHOLOGIST IN ACCIDENT PREVENTION

How to manage unsafe acts is a question that nags the researchers of human factors and IO psychologists. Limiting the incidence of dangerous errors can never be totally effective; still it is a way to manage errors. Another is creating systems that are better able to tolerate the occurrence of errors. Comprehensive management programs aiming the person, team, the task, the workplace and the institution as a whole may better manage errors and create safer working environment. A resilient system can be built to learn from errors and manage them. Recognize the human variability as a force to harness in averting errors. Constantly preoccupy with the possibility of failure, but work hard to focus that variability. High reliability organizations are not immune to errors (*Reason, 2000*) but they have learnt an art to convert the occasional setback to improved resilience of the system. Worksite investigation is good for it identifies specific hazards and stresses that potentially cause occupational accidents and injuries, and in planning the subsequent hazard control program (*Jovano-*

vic, 2004). Occupationally appropriate and task related engineering, ergonomics and design solutions should be developed (*Jovanovic, 2004*). Safety policies are needed and top level management is to be involved in the formation and execution of the policies.

Tokarczyk et al. (*2011*) conceptualize two kinds of prevention. Defensive prevention uses knowledge of risk factors to prevent accidents by limiting or eliminating these risk factors. Creative prevention uses such knowledge to strengthen the individual and protective factors and prevent the accident. They also give concept of first, second and third level of prevention. The first is concerned with the promotion of healthy behaviors. The second is intended for the risky groups and aims to limit the period of dysfunction and make them withdraw from the risky behaviors. The third one is directed towards the high risk group and aims to counteract the deepening of dysfunction and illness process.

The equipment found in workplaces is so flexible these days that the responsibility has moved from training the worker to cope with what is practically attainable to designing a system that ties the human's abilities.

The IO psychologists can play a substantial role in the prevention of accidents. In the words of Green (*1990*),

"It is clearly part of the task of the applied psychologist to evaluate the risk that may be inherent in a piece of design, but broader interests will inevitably need to be taken into account, and the role of the psychologist may be less clear in evaluating the balance between the probability of hazardous failure and the economic cost of rectification."

Teamwork training is good if the job is to be accomplished as a team. According to Murphy et al. (*1986*), buffer factors such as social support and stress coping skills help to weaken the stressor/acute reaction connection and help reduce the rate of accidents and occupational illnesses. Road safety system should be directed at decreasing the number of the road accident victims and helping the sufferers (*Tokarczyk et al., 2011*). Employee assistance and wellness programs help employees to support mental and physical health

and hence to reduce health and safety costs of organizations (*DeCenzo & Robbins, 2010*).

Interventions

Stress management training (SMT) is a set of worker-oriented techniques that seek to make employees more aware of the sources of stress and the adverse effects these have on them (*Randall & Nielsen, 2010*). It is taken as secondary intervention. SMT gives employees strategies that will help them to react in a more healthy way to a range of different hazards they may encounter in the workplace. Cognitive behavioral therapies (CBT) influence the stress-related reactions by the change in cognition e.g. by re-labeling sources of stress. Stress inoculation training (SIT) immunize the workers by first exposing them to less stressful situations and make them practice thinking about the problems they are facing, and finally exposing them in real life to more stressful situations. Acceptance and Commitment Therapy trains individuals to accept their emotions and, rather than dwell on these emotions, to concentrate on the contingencies (*Randall & Nielsen, 2010*). There are relaxation based stress management trainings too. They include meditation, muscle relaxation techniques, etc.

Safety trainings

The problems of distractions can be addressed by safety trainings. Use of safety devices for the workers is a must. They must be subjected to 'realization trainings' so that their feeling of safety makes an important part of the procedure. Technological change always calls for another need of technical training and safety training. With a high level of safety and health awareness workers are able to conduct their work effectively and efficiently (*Mansor et al., 2011*). Ergonomic problems may be powerful progenitors of human error (*Green, 1990*). They do not demand intellectual solution but simply an appropriate appreciation of the balance between risk and cost. Equipment design, or traditional ergonomics, is an important topic to deal with while theorizing the human error. The dominant organizational factor of importance to system sa-

fety is attitudinal (*Green, 1990*). The organization may or can minimize the magnitude, when confronted with the safety problem. They must not believe own publicity. Trainings designed to restructure the attitudes, impart the skills and change the behavior may have to be given.

There may be failures of human nature. There may be failures in equipment design and failures of safety consciousness in system (*Green, 1990*) or failure of members coordination if the job is teamwork based. The psychologist should marshal all sorts of psychological knowledge to solve the perceptual, skill, design, selection, training, social and organizational problems. Safety trainings related to protection against common possible hazards and first aid trainings are essential. "Prevention is better than cure" is truer today than ever before. Safety trainings are seen as primary intervention aiming to thwart errors leading to accidents.

CONCLUSION

Worksite investigation is good to identify specific hazards or stresses potentially causing occupational accidents and injuries and in planning the subsequent hazard control program. Some theories claim that human error causes accidents. The lapses in work designs and bad decisions by the management are attributed by other theories. Error reporting system can be established to lessen the human errors and behavioral errors. If the selection process makes the work-person match guaranteed, many accidents due to accident proneness are avoided. Awareness, education and skills training given to employees dramatically alleviate the rate of errors. Regulation enforcement by the governing body is a must. If organizations want to increase the productivity, they should be ready to spend some money on health, safety and protection of workers. This expenditure will pay off in the long run. The healthy workplace is a basic infrastructure to outpace the competitors these days. Whenever sick buildings are noticed, the organizations should minimize the hazards. They should look at the engineering design and investigate the procedural component too. Psychologists can help redu-

ce error rate by primary, secondary or tertiary interventions by attacking (or correcting) the human, behavioral or ergonomic lapses. They can also become involved in education and re-education with the rest of the management. Safety training is very necessary, especially in risky businesses. Employees and workers should know in advance the effects and harms of risk factors and hence use personal protective equipment (PPE) like helmet, goggles, gloves, safety belt, mask, safety jacket, etc. Stress is caused by personal or organizational stressors. So stress management trainings may have to be conducted to train workers to successfully cope with the stress. Stress is one of the major causes of accidents. Employee assistance programs, risk management models and wellness programs also can help prevent accidents, manage risks and promote the physical and mental health of the workers.

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POGREŠKE I NESREĆE NA RADNOM MJESTU

SAŽETAK: U radnom okruženju pogreške su neizbježne. Nesreće nastaju zbog ljudskih pogrešaka i grešaka u sustavu, a za posljedicu imaju neželjene štete i ozljede. Nesreće na radu uzrokuju goleme gubitke u životima i imovini. Razne teorije na različite načine objašnjavaju uzroke nesreća. Neke pripisuju nesreće ljudskim čimbenicima dok druge smatraju da se uzroci nesreća mogu naći u greškama sustava ili načinu upravljanja. Neki su ljudi skloniji pogreškama od drugih, izloženih istim čimbenicima rizika, i to zbog neznanja, nemara ili sklonosti opasnom ponašanju. Kognitivno preopterećenje i drugi problemi etičnog ponašanja mogu biti uzrokom pogrešaka, pa tako i nesreća. Rad u skupini može pojedinca navesti da se prikloni mišljenju ostalih u skupini i tako dobije osjećaj neranjivosti, kako se vidjelo na primjerima katastrofa Titanika i Challenger. Država mora osigurati učinkovitu provedbu zakona o zaštiti na radu. Uprava može imati važnu ulogu u smanjenju broja pogrešaka i nesreća na radu. Osim toga, može pozvati psihologe da pomognu sniziti na najmanju moguću mjeru ili barem smanjiti broj pogrešaka i nesreća. Obrazovanje iz zaštite na radu iznimno je važno u suvremenom radnom okruženju. Bolesne zgrade uprava mora popraviti čim se ustanove opasnosti.

Ključne riječi: pogreške, nesreće, ljudske pogreške, privid neranjivosti, stres, stresori, organizacijski stres, kognitivno preopterećenje, čimbenici rizika, zaštita, zdravlje na radu

Stručni rad
 Primljeno: 27.1.2014.
 Prihvaćeno: 2.2.2015.