

Management of occupational health and safety in nuclear power plants essay

[Business](#), [Decision Making](#)



Introduction It was back in April 28, 1986 when the Chernobyl incident in Ukraine created a reverberating imprint throughout the Soviet Union. It was a result of an unsound reactor design in Chernobyl's Unit 4 that was mismanaged by inept personnel and also due to their disregard for proper safety and precautionary measures. The accidental destruction of Chernobyl's Unit 4 reactor generated extensive spread of radioactive material and a large amount of radioactive waste in the Unit, at the plant site and in the surrounding area (IAEA, April 2006, p. 30). A decade since the Chernobyl accident, there had been efforts to conduct a series of safety improvement within the technical areas. In a seminar for consortium between the U. S.

and European Countries supporting safety projects at Chernobyl, it was stated that there was a development in the technical areas mainly of training, analytical simulator, symptom-based emergency operating instructions, management and operational control procedures, quality assurance, fire safety upgrades and safety parameter display system (Moffitt, 1996). Actions Done to Resolve the Incident Based from the 2006 Annual Report of the International Atomic Energy Agency, an Operational Safety Review Team (OSART) program has been conducted since 1982 to provide assistance on selected operational aspects and on the safety management of nuclear power plants. Ukraine was one of the visited areas wherein the OSART would review and impart their expertise on accident management, long term operation and application of probabilistic safety assessment for decision making. The involvement of the United States in many countries all over the world can be viewed as a necessity, for the U. S.

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plays a vital role in providing assistance and technical support to those that are inept of the technical expertise. In the case of the Chernobyl nuclear plant, the U. S.

Department of Energy has sent a team of experts to coordinate with the Chernobyl plant personnel in an effort to upgrade operational safety and training at the said nuclear plant. The U. S. experience in employing improved practices for management of operations is shared through teaching Chernobyl plant personnel and presenting them opportunities to observe and study nuclear power plants in the United States.

The main objective of training was to improve operational safety through enhanced training for plant personnel. Symptom-based emergency operating instructions provide operational safety by developing and implementing symptom-based emergency operating instructions. Such are now being taught with greater emphasis as to ensure that the personnel in the nuclear power plants gain awareness and the right mindset when handling emergency situations. Instructions as to how to stabilize the nuclear reactors are being taught firsthand by the team of experts to the plant operators. Plant safety information are also computerized in a safety parameter display system that alerts control room operators in case of an emergency. On top of that, the management of Chernobyl is also collaborating with the U.

S. Department of Energy and other U. S. companies to create an analytical simulator for training control room operators. Analytical simulators aim to provide a model for Chernobyl 1 - 3 for training and for use in development

as well as validation of symptom-based emergency operating instructions. This instrument uses graphic displays and computer programs to copy a variety of plant conditions so that control room operators can improve their response to routine and emergency situations.

As part of this effort, computer hardware, operating system software, and software models for the Chernobyl Unit 3 plant systems are being provided, along with training to help the plant staff maintain and use the simulator effectively. The common agenda included herein composed of the development of procedures, labeling and tag-out of equipments, procedure training and implementation of improved programs and procedures as well as the orientation and management of the structure analysis. This is further complemented by the principle of quality assurance that is also geared towards the improvement of safety.

An ISO 9000 gap analysis of Chernobyl's Quality Assurance program was conducted to determine and select applicable Quality Assurance procedures. Fire safety upgrades are of particular importance to the overall safety of the Chernobyl nuclear power plant. This is to reduce the risk of fire at Chernobyl through improving the fire detection and suppression capabilities and upgrading the fire separation of vital rooms and compartments. Ukrainian and U. S. firms have collaborated to manufacture fire proof doors at a Ukrainian factory qualified to meet international standards. Other than that, fire detectors, fire-retardant sealant barriers, and firefighting equipment, such as firefighter suits and hose nozzles have also been procured to

facilitate the operational management and safety within the nuclear power plant (Moffitt, 1996).

Analysis of the Incident and Actions Done Ukraine lacks the necessary financial resources to provide basic equipment and training required for worker safety at the shelter. Initial efforts by Ukraine, the G-7 countries and the European Commission have concentrated in the six areas of shelter structural integrity, radiation dose reduction, nuclear safety monitoring, dust suppression, industrial safety enhancement, and emergency preparedness. According to the International Nuclear Safety Program, it was during 2000 that Unit 3 of the Chernobyl nuclear power plant was shut down and the remaining stabilization of existing shelter and construction of a new protective shelter was completed in 2005, yet ensuring its long-term stability remains to be seen.

The clean-up and renovation after the Chernobyl accident leaves more hazards behind as workers are exposed to more radiation and other safety hazards. It has become a necessary and urgent appeal to solve the profoundly damaged supplementary structures surrounding Unit 4 to avoid further spread of radiation. It took more than a decade after the incident for the Chernobyl Shelter Organization to develop a plan for stack stabilization and committed to performing the work. It may be recalled that in May 1986 the board of Governors of the IAEA having 'considered the recent reactor accident at the Chernobyl Nuclear Power Station and other accidents in the past' and noting 'the evident need for greater cooperation in nuclear safety'. The Convention on Early Notification of a Nuclear Accident and the

Convention on Assistance in the Case of Nuclear Accident or Radiological Emergency were thereafter prepared, adopted and signed within a few months only (Prevor, 2006, p2). The Chernobyl Center for Nuclear Safety, Radioactive Waste and Radioecology, created in 1996 during the time of Ukrainian President Kuchma, aimed to shutdown and deactivate plan for Unit 1 of Chernobyl Nuclear power plant, assess the needs for remote technologies and shelter remodeling as well as to collaborate with national and international centers of excellence and national lab network in the U.

S. (Dodd, 1998). In order to promote the new strategy for recovery with government agencies and international donors, and to help initiate the implementation of the recommendations of this strategy, the United Nations Coordinator of International Cooperation on Chernobyl undertook a second visit to the region in April 2002 (UN, 2001). Notable efforts were conducted in a desperate plea to resolve the threats of the nuclear fallout in Chernobyl. However, such endeavor can not be fully considered to be adequate as several other factors including the health and lives of the victimized people can never be restored to the way it was. The radioactive contents emitted into the environment had already left an irretrievable stain.

The slight miscalculation and non-conformity to standards has evolved into an irreparable consequence that will stay in man's history to remind him of his liability for his actions. Furthermore, for the management of safety to be effective, the operating organization must have a very high level of commitment to safety, best expressed by a highly developed safety culture (Stoiber et al, 2003). According to Richard Meserve (2007), nuclear safety

levels have improved on average as operators are getting better. Learning from their own experience and from each other. He further stressed that constant vigilance has not just become necessary but vital and so has being completely forthright with people wherein once a problem arises, one must be prepared to reveal the facts honestly to sort things out faster and better.

Conclusion and RecommendationNuclear energy presents one of most serious challenges for our human civilization (Milenin et al, 1997). The plight of limited natural resources, threatened by man's insatiable needs, has driven man to find other alternatives that could serve as viable replacements for their needs. It has become quite apparent that resorting to nuclear energy can indeed facilitate the path of mankind to a sustainable future.

Yet the price that must be paid for a slight inaccuracy when dealing with nuclear energy can be more destructive than its promising gain. Presently, the pursuit for alternatives to nuclear energy is in progress. Hence, the international community ought to perform all that is possible to guarantee the nuclear energy is managed safe enough to not pose as a grave threat to the existence of mankind in this world, on the contrary to establish a greater and sustainable world for mankind. In conjunction with the growth of the nuclear technology, the continuing advancement of the national and international legal policies on nuclear energy use has become an indispensable matter. Although the ratification of a legal framework alone can not be a means to guarantee nuclear safety and security, the role of enacting sound policies and clear-cut laws regarding nuclear energy is a prerequisite towards a sustainable future. The ratification of national

legislative framework dealing with the use of nuclear energy and ionizing radiation is significant in establishing institutions and rules necessary for the safe management of technologies. The legal and political framework must complement and evaluate with the technical, institutional, socio-economic and ethical facets. Weak policy measures can encumber the advancement and augmentation of a nuclear safety culture.

On the other hand, a formidable legal framework can develop a nuclear safety culture, either by ensuring that the essential regulatory resources are available, by facilitating transparent communications, by serving to forestall institutional conflicts or by ensuring that independent technical judgments are not hindered for irrelevant grounds. It is an imperative for the future of nuclear power that communications among regulators, operators, the scientific community, and public be improved. Power reactors pose greater risks than other nuclear facilities. From a working paper by Millenin et al (1997), it was said that nuclear reactors required high levels of operational safety are achieved and maintained by implementation of a coherent set of criteria, standards, and practices, integrated with continuous verification. The devastating Chernobyl Incident highlighted some substantial shortcomings and disparity in the international legal and regulatory norms that had been established to run safe and peaceful operation of nuclear energy.

Ukraine, once being part of the Soviet Union, also shared the same view of the Soviets that likened the IAEA safeguards to a ' spider's web' designed to ensnare developing countries and to stifle their scientific and technical

progress (Fischer, 2007, p9). Instead of complying with international standards created by the IAEA, biased views on the IAEA had caused a rumbling effect that Ukraine had to ultimately suffer. There was a lack of understanding of such basic concept such as risk. The aftermath of the Chernobyl incident has prompted the recognition of a need for a global and not just a national approach (Waller, 2007). This horrible incident accentuated the need for a collective international focus on nuclear safety and stimulated the formation of an international system for the safe development of nuclear energy which was under the patronage of the International Atomic Energy Agency.

It also served as a wake-up call for the international community with nuclear capabilities to consider working their policies in a common vision through means of cooperation and mutual accord. The Chernobyl Incident that happened more than 20 years ago bequeathed a pungent admonition to all of humanity that impels us to retrace back our steps of failure in order for us to be able to stride ahead to an assuring future. As such, there is an appeal to a thorough reexamination of the past failures in man's history caused by his irrationality, imprudence and negligence.

Corporate social responsibility must be enforced circumspectly within the nuclear energy sector in order to protect and safeguard not only the interest of the elites but most importantly that of the workers. Employees must be directly involved with the planning and conducting of inspections in the workplace in order to foster a culture of safety for the workers. According to the Nuclear Safety Review for the Year (2006), the Safety Fundamentals

upon which the Safety Standards of the IAEA are based was consolidated for a consistent and strategic approach to safety across the entire spectrum of nuclear activities. The integration of nuclear safety policies and programs is also a viable solution that could prevent further lethal human errors in the future. BibliographyDodd, L.

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