

## “Impact of Ergonomics implementation on the Safety Culture: A Literature Overview”

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### Abstract:

This research paper tries to establish a relationship between the ‘Ergonomics’ and the ‘Safety Culture’ variables specific to the Oil & Gas Industry in the Middle East region, by reviewing the related Research papers published in the same area.

The model used is HSE Culture ladder by “International Association of Oil and Gas Producer” (OGP), the concept has supported by Hudson (2001) that define safety culture maturity model into 5 levels namely Pathological, Reactive, Calculative, Proactive and Generative.

Literature review was done with the Research Papers, Safety Manuals and various other documents in the said field and several gaps were identified in the study which will form a base for the Research Study. It was observed that a lot of research has been done in allied areas, but no significant research is carried out in the area where effect of implementing Ergonomics is studied to show the improvement in the ‘Safety Culture’ of that organization.

The major gaps identified were pertaining to developing new models, approaches and tools to integrate prevention of work-related injuries and diseases into the design process and also a need of analysis of the occupational hazards and accidents and ways to address them as a part of improving the ‘Safety Culture’ of the organization.

**Key words:** *Ergonomics, Safety Culture, Oil & Gas, Occupational Hazards*

### Introduction:

Oil & Gas sector in UAE has been very turbulent especially after the Crude Oil market fall in the year 2016. However ‘Safety’ is something which is not being ever compromised and most of the Operating Companies are making the norms more and more strict. Researcher has done an exclusive analysis about the relationship which is found between the ‘Ergonomics’ at work place and ‘Safety Culture’ found at the work place.

Safety culture has been described as the collective values and attitudes of the people in the organization; “It is the way we do things around here” (Changing mind, 2000).

Safety culture can be simply defined as the attitudes, values and beliefs that underpin “the way we do things here” (OGP, 2010).

The safety culture of an organization is the product of individual and group values, attitudes, competencies and patterns of behaviour that determined the commitment to, and the style and proficiency of, an organization’s health and safety performance.

The reference model used is HSE Culture ladder by “International Association of Oil and Gas Producer” (OGP) which has 5 levels from Pathological to Generative.

### **Literature Review:**

The paper titled ‘Articulating Ergonomics and Engineering Design To Develop Healthy and Safe Work Environments’ authored by Moraes, A. S. P.1, Arezes, P.M.1, and Vasconcelos, R, had key research findings in the form of Engineering design process being applied to multiple criteria decision making process which happens in an iterative way which is usually fragmented between different specialists. The key problem areas or gaps identified by this study was pertaining to a need to develop a model to integrate prevention of work related injuries into design process.

The research titled ‘Safety and Human Factors Considerations in Control Rooms of Oil and Gas Pipeline Systems: Conceptual Issues and Practical Observations’, authored by Najmedin Meshkati Viterbi School of Engineering, University of Southern California, Los Angeles, USA (Meshkati, 2006), found out that several human factor elements will contribute to the lack of controller success in preventing or mitigating accidents or incidents for which he identified an improvement in the form of embedding the structure with the relevant information which is accessible to all the concerned.

‘Identification of Ergonomic Issues That Affect Workers in Oilrigs in Desert Environments’ authored by Ashraf A. Shikdar Sultan Qaboos University, Sultanate of Oman (Shikdar, 2004) identifies some major ergonomics issues pertaining to hard physical work, back pain, discomfort, hot environment, log shift and diverse schedule. The findings also suggested to have certain intervention strategies which are to be formulated and implemented to improve employee safety at work and overall ‘Safety Awareness’ at work.

M. AlKhaldi, C. Pathirage and U. Kulatunga School of the Built Environment, University of Salford, Salford, M5 4WT, UK (Alkhaldi, 2017) authored a research paper titled ‘The Role of Human Error in Accidents Within Oil and Gas Industry in Bahrain’ which addresses human error and resulting accidents out of it. The author suggest that there needs to be a focus on real scheme of these accidents in this type of industry and committing to safety requirements in all operations may assist in overcoming this problem and identifying various solutions pertaining to improving the ‘Safety Awareness’ among employees.

Research paper titled ‘Ergonomics, and occupational health and safety in the oil industry: a managers’ response’ authored by Ashraf A. Shikdara, Naseem M. Sawaqedb Department of Mechanical and Industrial Engineering, Sultan Qaboos University, P.O. Box 33, Al-Khod 123, Muscat, Sultanate of Oman Department of Mechanical Engineering, Mutah University, Amman, Jordan (Ashraf A. Shikdara, 2004), discusses about how Ergonomics and Occupational Health is related to safety at work. The authors found out that the user population should be taken into account while implementing ergonomic rules, practices, and recommendations in the design of the job and workplace. The environment must be properly taken into account.

On the theme of ‘Safety Culture Based on the Culture of Safe Behaviour at Work’ authors Sadłowska - Wrzesińska J, Faculty of Engineering Management, Chair of Ergonomics and Quality Management, Poznan University of Technology, Poland (J, 2017) has presented a research paper titled ‘Developing a Safety Culture Based on the Culture of Safe Behavior at Work-A Challenge for Polish Companies’ which clearly states the need of qualitative research and the appropriate preparation of employees to take part in survey measuring Safety Culture of any organization. Also they clearly stated that Organizations attempting to develop their safety culture based on trust and employee engagement may find inspiration from the analysis of mistakes made during the implementation of behaviour-based programmes.

### **Conclusion:**

Literature review was done with the Research Papers, Safety Manuals and various other documents in the said field and several gaps were identified in the study which will form a base for the Research Study.

After critically analysing the research papers and articles in this niche field of Oil and gas and its relation to safety culture, the researcher further would pursue this endeavour in trying to satisfy the gaps which were identified in around 15 related research papers (out of which 6 are summarised above). It was observed that a lot of research has been done in allied areas, but no significant research is carried out in the area where effect of Ergonomics is taken together relating it to the Safety Culture of the organization especially in the UAE region.

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