EMPLOYEE WELL-BEING FRAMEWORK TO FACILITATE A TOTAL SAFETY CULTURE WITHIN A NUCLEAR POWER PLANT

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Employee well-being, i.e. a total state of physical, mental and social health, is a prerequisite for organizational performance. Given its importance, employee well-being is receiving increased attention in the literature from a variety of perspectives. Studies focusing on occupational disease show that occupational stress is on the increase. In this regard the United Nation's International Labor Organization recently described occupational stress as a worldwide epidemic. Occupational stress cannot therefore exclude complex nuclear facilities. Probabilistic Safety Assessment techniques were subsequently used to develop scenarios for hypothetical accidents that might result in severe core damage and to estimate the frequency of such accidents. The US Nuclear Regulatory Commission places emphasis on a Safety Conscious Work Environment as an attribute of a safety culture within a nuclear plant and the SECY-04-0111 regulator stipulates that the necessary full attention should be given to safety matters and that personal dedication and accountability of all should engage in activities which have bearing on the safety of nuclear power plants. Findings of occupational stress studies indicate that the workplace is the main source of occupational stress, which spills over to the environment, family and society. Well-being studies focusing on employee engagement show that few employees are engaged, while the vast majority is not engaged, or even disengaged. This finding suggests that employees' well-being may be at risk, affecting the organization's risk profile. Additionally, these studies reiterate the role of leadership and management in ensuring employee well-being. If organizations do not attend to employee well-being, it may have detrimental consequences for both the employees and the organization. Leadership is ultimately charged with the responsibility of creating an environment nurturing employee well-being, in shaping a total safety culture. The purpose of this paper is to present a theoretical framework of nurturing employee well-being, which aims to facilitate a total safety culture within a nuclear power plant. This framework integrates some of the most often-used tools to improve employee well-being. These include the (i) job-demands-control-support model of stress of Karasek and Theorell (1990) (Ref. 19), which proposes that work should be reconstructed to minimize, if not avoid bad stress; (ii) the job-diagnostic survey of Hackman and Oldham (1975) (Ref. 10) proposing the redesign of work as organizational change strategy directed at increasing employee motivation and productivity and thus improving organizational performance; and (iii) Kahn's concept of psychological presence, which forms part of employee engagement, which allows employees to be fully present in performing their work roles. This theoretical framework will be empirically tested in subsequent research.

I.   INTRODUCTION

The US National Safety Council explains that Occupational Safety and Health encloses conditions and factors that impact on safety efforts by any organization and should be controlled and eliminated. Optimal occupational safety results from continuous proactive processes where conditions and factors that affect the well-being of employees, temporary workers, contractor staff, visitors and any other person in the workplace.

According to the US National Safety Council, "effective occupational safety efforts involves the control and elimination of recognized workplace hazards to attain an acceptable level of risk and to promote the wellness of workers". Optimal occupational safety results from a continuous proactive process of anticipating, identifying, designing, implementing, and evaluating risk-reduction practices. The International Atomic Energy Agency (IAEA) published in 2006 *(Ref. 11)* guidelines in Knowledge Management for Nuclear Industry Operating Organizations where recommendations were made to promote and support nuclear knowledge management for achieving competitive advantage and maintaining high levels of safety within nuclear power plants. Some of the guidelines are summarized below:

i)   Managers practice visible leadership by observation of performance, coaching and mentoring and reinforcing standards and will encourage cooperation and teamwork.

ii) Managers identify employee-needs through the ongoing workforce planning process. The workforce planning process includes a knowledge loss risk

assessment, identifying knowledge that is critical to the organization and may be lost in the near future.

iii) Human resources work with line managers to anticipate employee needs and to recruit sufficient employees with knowledge and skills to work in the nuclear industry.

iv) Plant workers are self-critical and frequently provide feedback to improve the knowledge management processes, plant performance, processes, procedures and training. The guidelines suggest that employees are willingly reporting problems, near-misses, error-likely situations and safety hazards, based on percentage indicators of the total number of plant deficiencies.

v) The feedback process includes post-job reviews and management observations, which is used to improve human performance and knowledge transfer. There are guidelines for this process to encourage, monitor and address employee feedback.

Unfortunately in the recommendation and guidelines for Knowledge Management, no specific mention was made of employee well-being or maintaining a safety culture, although a link to some of the suggestions can be made on employee well-being. The IAEA publications also show no results regarding this matter. These findings in literature demonstrates that there may be a lack of attention from top management in shaping a total safety culture and employees as an organization's most valuable asset, total wellbeing is neglected. Organizations failing in maintaining employee well-being and safety culture, regardless of the importance thereof, are putting employees and the organization's success at risk. The International Labor Organization introduced easy-to-apply checkpoints in 2012 to identify stressors in any work environment and it can just as easily be included in the employee well-being policy / program of a nuclear power plant.

Organizations need to demonstrate a continuous commitment to employee well-being and organizational management need to be trained to ensure that there is an understanding of the employee well-being responsibilities. Top management need to be confident and skilled to implement policies, regulations and legislation in order to convey their engagement to employee well-being, creating a total safety culture and health and safety of the organization. The purpose of this paper therefore is to present a theoretical framework to nurture employee well-being, aiming to facilitate a total safety culture within any organization and with emphasis on a nuclear power plant.

II. EMPLOYEE WELL-BEING

Employees of any organization are generally viewed for their contribution to an organization's performance and employee well-being is definitely or seems to be an organization's minor concern. This misconception is slowly turning as the United Nation's International Labor Organization (ILO) describes occupational stress as a worldwide epidemic and organizations start to realize the value of employee well-being. This change of approach is also promoted by the International Labor Organization's International Labour Standards on Occupational Safety and Health aimed at employee wellbeing.

Occupational stress can be defined as a person's response based on his/her subjective appraisal of life events (Lazarus, 1991) *(Ref. 21)*, causing strain when they perceive they cannot cope with the event, which is the immediate cause of wellbeing and behavior (Bowling, Alarcon, Bragg, and Hartman (2015) *(Ref. 2)*.

Employee well-being can be divided into:

i) Psychological well-being:
This includes factors such as satisfaction, self-respect and capabilities. These factors influence the job performance of employees and also organizational challenges put to employees.

ii) Physical well-being:
With physical well-being, the focus falls on the health of employees (e.g. muscular-skeletal disorders, disorders of the digestive system, cardiovascular disease and diabetes). This has an influence on the job demand and the organizational work environment of the employee.

iii) Social well-being:
Social well-being encompasses the relationships employees are engaged to and would have an influence on the personal networking of employees and would include the sense of organizational safety experienced by employees.

Research conducted into the relationship between psychological well-being and job performance established that it is directly correlated (Cropanzano & Wright, 2004) *(Ref. 6)*. The studies showed that employees with higher levels of psychological well-being perform better, showing that well-being is a stronger predictor of job performance than job satisfaction. On the contrary the studies also revealed that employees with low psychological well-being caused by major work stressors impose serious health risks (Cropanzano and Wright, 2004) *(Ref. 6)*. Negative work stressors and consequences such as depression, stress, illness, and absenteeism can be associated with misbehaviors in the work environment and failure in job performance, with dire consequences for the sustainability

of the organization; thus, adversely impacting the well-being of both the employee and organization (Bowling, Alarcon, Bragg, and Hartman 2015) *(Ref. 2)*.

It is necessary that employee well-being should be incorporated in organizational goals to enhance employee high-performance and organizational management in high-involvement and commitment. This comes down to a balance between organizational success and the value of employee well-being, which is central to organizational success. Such a balance should bring joint benefits to both the organization and employees.

III. EMPLOYEE WELL-BEING IN A NUCLEAR POWER PLANT

A nuclear power plant is complex and although nuclear safety has three objectives namely: ensuring that such a facility operate normally and without an excessive risk of operating staff and environment being exposed to radiation from the radioactive materials, to prevent incidents and to limit the consequences of any incidents that might occur, occupational stress still have an impact on the human performance levels (NEA, 1992) *(Ref. 27)*. The impact on the physical, mental, psychological and psychosocial factors of human operators within a nuclear power plant with reference to NUREG-0711, 10CFR26 and R.G.5.73 by U.S.NRC are strict on the management of stress and fatigue but still does not prevent occupational stress. (Leonard, 1994) *(Ref. 21)*.

There are limited studies and literature focusing on nuclear power plant operators/workers and the impact of occupational stress is merely a correlation between stressful work environments with other high risk industries. The studies compiled within high-risk work environments identified the following hazards contributing to the increase of occupational stress: hypertension, absence from work for long periods of time, increased rates of tension, anger, anxiety, depression, head aches/migraines and sleep loss. (Robinson, et al. 2009 *(Ref. 7)*; Rodwell and Fernando, 2015 *(Ref. 33)*. These findings indicate that the workplace is the main source of occupational stress spilling over to the employee self, family and society (Giorgi, Shoss, and Leon-Perez 2015) *(Ref. 9)*.

Assumptions made by McGregor's Theory X and Y[25] can be applied in nurturing employee well-being in any industry. Theory X implies that management follows a very directive "command-and-control" assessment where employees have very little say in organizational matters, including occupational health and safety (which is contrary to provisions of IAEA as stated in opening paragraphs). In contrast, Theory Y provides a more self-fulfillment with a higher performance rate amongst employees, emphasizing

a healthy employee well-being within the workplace. (Schermerhorn, 2011) *(Ref. 34)*. This is underlined by the US Nuclear Regulatory Commission (NRC) definition (2016) *(Ref. 35)* of a nuclear safety culture, as the core values and behaviors resulting from a collective commitment by management and employees to emphasize safety over competing goals to ensure the protection of people and the environment.

IV. EMPLOYEE ENGAGEMENT

Numerous definitions in literature are used to define employee engagement. A widely-accepted description of employee engagement can be explained as:

i)   creating opportunities for employees to connect with colleagues and organizational management (Jawad & Scott-Jackson, 2016) *(Ref. 17)*;

ii) employee motivation to connect with their job tasks - psychological presence, (Jawad & Scott-Jackson, 2016) *(Ref. 17)*;

iii) commitment and motivation where employees want to be part of the organizational success and will therefore exceed standard requirements (Jawad & Scott-Jackson, 2016) *(Ref. 17)*.

The most often-used definitions of engagement are those of Kahn (1990) *(Ref. 18)* and Schaufeli, Salanova, González-Romá and Bakker (2002) *(Ref. 33)* (see Byrne, Peters, and Weston 2016) *(Ref. 4)*. They deem the definition of Kahn (1990) *(Ref. 18)* as more comprehensive than that of Schaufeli et al. (2002) *(Ref. 34)* because it addresses both the conditions fostering engagement and engagement itself. Given the important role of leadership/managers in ensuring the wellbeing of employees and the organization (Bowling et al., 2015 *(Ref. 2)*; IAEA; Purcell, 2014 *(Ref. 31)*; US Nuclear Regulatory Commission (NRC) definition, 2016 *(Ref. 35)*; van Loggerenberg and Nienaber, 2015 *(Ref. 38)* we adopt the definition of Kahn (1990) *(Ref. 18)* for purposes of this paper.

Kahn (1990) *(Ref. 18)* describes employee engagement as individuals who can express their authentic selves, physically, cognitively and emotionally in their work role which is influenced by the psychological conditions of meaningfulness, safety and availability.

Psychological meaningfulness refers to how significant is it for the employee to bring his/her authentic self to the workplace in view of the 'return' he/she receives to do so. Psychological meaningfulness is influenced by task characteristics (e.g. clearly delineated, challenging, variety), role characteristics (e.g. identities that

organization members are implicitly required to assume, which they may like or dislike) and work interactions (interpersonal interactions with co-workers and clients).

Psychological safety refers to how safe is it for the employee to bring his/her authentic self to the workplace without fear of negative consequences to his/her self-image, status or career. Psychological safety is influenced by interpersonal relationships (especially characterized by support and trust), group dynamics (e.g. unacknowledged and/or unconscious roles impacting the conscious working), management style and processes (e.g. openness and supportive) and organization norms (shared expectations about the general behaviors of system members).

Psychological availability refers to how ready an employee is to bring his/her authentic self to the workplace because of the resources they have to personally engage at a particular moment. Psychological availability is influenced by depletion of physical energy (e.g. long working hours, heavy workloads) and depletion of emotional energy (e.g. frustration in getting job done), insecurity (e.g. lack of self-confidence) and outside lives (non-work lives).

Kahn (1990) *(Ref. 18)* further explains employee disengagement as the withdrawal of the physically, cognitively and emotionally during performance of job tasks. Consequently the three psychological conditions of the physical, cognitive and emotional influence work behaviors and employee engagement.

It is the responsibility of organizational management to create an environment that facilitates engagement amongst employees (Purcell, 2014) *(Ref. 31)*. Job resources such as social support from colleagues, organizational management, performance feedback, skill variety and individuality will enhance a motivational process, leading to employee engagement. These mentioned job resources will become more significant and gain motivational potential if employees are challenged with a higher job demand. It is essential that positive organizational behavior approaches include the quest of employee well-being, - happiness, - health and – engagement as feasible goals.

V. THE LINK BETWEEN EMPLOYEE WELL-BEING AND EMPLOYEE ENGAGEMENT

Imperatori (2017) *(Ref. 14)* argues that academic research supports a distinct link between employee well-being and employee engagement. This observation is consistent with Kahn (1990) *(Ref. 18)* as well as Schaufeli,

Salanova, González-Romá and Bakker (2002) *(Ref. 33)*, the dominant authors in the field of engagement.

Engaged employees experience high levels of energy and strong identification towards their work and this reflects on employee well-being within the work environment where job demands are better harnessed and handled. Presumably where there is symptomatic evidence of a lack in employee well-being and employee engagement, the relationship between job demand, performance and work engagement will be weak (Imperatori, 2017) *(Ref. 14)*.

Organizational management which pays attention to facilitate employee well-being will enhance employee engagement and employees will be more committed to solve problems regarding the work environment and employees will be more resilient to challenges and changes within the organization.

VI. THEORETICAL FRAMEWORK

A theoretical framework is needed to encourage employee well-being, aiming to facilitate a total safety culture within a nuclear power plant. This framework integrates some of the most often used tools to improve employee well-being. These include the (i) job-demands-control-support model of stress of Karasek and Theorell (1990) *(Ref. 19)*; (ii) the job diagnostic survey of Hackman and Oldham (1975) *(Ref. 10)*; and (iii) Kahn's (1992) *(Ref. 18)* concept of psychological presence. This theoretical framework will be empirically tested in subsequent research.

VI.A. Job-demands-control-support (JDC) model of stress:

Different kinds of jobs comprise different levels of work stress due to environmental factors such as work load, decision making authority, and the extent to which an individual can choose to employ their skills (Theorell & Karasek, 1990) *(Ref. 19)*. Theorell & Karasek name these work environmental elements in turn: job demands, decision authority and skill discretion and is often referred to as the job-demand-control model (JDC model).

Job demands include both physical and psychological demands. The former includes how hard employees work, and the number and quality of output units produced/delivered in a given period of time, availability of information to discharge of responsibilities and deadlines; while the latter includes role overload, role conflict, role ambiguity, personal conflicts and skills obsolescence. Control over one's own job combines skill discretion (the breadth of skills that the worker can use in

a job) and decision autonomy (the independence workers have in making decisions affecting their jobs) and is represented by decision latitude. Social support refers to the overall helpful social interactions available at the job from both co-workers and supervisors. Employees experiencing a combination of high job demands, low control and low social support most adversely react to psychological strain and are susceptible to negative health outcomes, compromising organizational performance (Karasek and Theorell 1990:31) *(Ref. 19)*.

According to Karasek and Theorell (1990) *(Ref. 19)* damaging occupational stress is avoidable because it originates from job demands, job control or support. They argue that work can be reconstructed in a way to reduce risk, while enhancing wellbeing. This can be done by transforming work by altering job demands, job control and support. However, they point out that personal behavior changes must also be addressed. Hence, to be successful all role players should be involved in the reconstruction process.

The following psychological stressors such as work load, interruption rate, time pressures, conflicting demands, concentration degree, pace of work, and performance under pressure etc. can be included and will influence the job demand and causes work strains.

LaChapelle (2008) *(Ref. 20)* refers to work strain and decision latitude and argues that there is a link between the two dimensions. Decision-latitude refers to the employee's control over job tasks and how the tasks are executed and it relies on skill discretion and decision authority. Skills discretion involves the variety of job tasks, levels of repetitiveness, occasions for creativity and developing abilities. Decision-authority involves the employees' ability to make decisions about their own job, the ability to influence others and organizational management.

Crossing the dimensions of strain and decision latitude, LaChapelle (2008) *(Ref. 20)* provides four stress categories for jobs, based on P A E I management styles, which refers to the Adizes concern structure model, where a distinction is made between the values of effectiveness and efficiency:

i)   P – High strain jobs (Low latitude, High strain)

This can be applied to work environments where the strain levels are high and there is no seeking of additional latitude and opportunities are overlooked to ask for more latitude.

ii)   A – Passive jobs (Low latitude, Low strain)
This can be applied to work environments or work tasks that don't require high outputs. Passivity stems from the job being either irrelevant or unimportant and would likely not be satisfying. Disruptions in the work demand would most likely have a process in place to cope with contingencies and that would buffer the dynamic variables of the organization, preventing disruption.

iii) E – Active jobs (High latitude, High strain)

In Karasek's typology, active jobs are not seen as stressful, since employees have many protective measures available to them to reduce work strain. Of all the PAEI styles, it is E that most logically succeeds in active situations. In active job environments there is a great ambition and almost no fear surrounding disruptions of the status quo. Strain is a continual consequence of E-type work. Active jobs therefore need flexibility and latitude to solve problems and seek solutions.

i)   I – Low strain jobs (High latitude, Low strain)

Social processes are very significant in low strain job environments. Employees will have greater authority and will be more engaged in the definition and management of tasks.

Nuclear power plant operators, which are required to undergo lengthy training and to be licensed, will fall into the E category of the PAEI styles. The job-demand on these workers is very high. In addition to this the NRC requires, according to the 47 FR 7363, that operators should periodically be relieved and assigned to duties away from the control board in order to reduce fatigue during a shift. The job-demand further requires that workers remain stationary for a long period of time, also causing fatigue.

Following the JDC model it would propose that work should be reconstructed to minimize or avoid negative stress. Management should design work assignments to vary tasks every two hours, recommending several strategies to reduce fatigue for example allowing operators to take scheduled breaks away from the control panel, balancing the workload across shifts in order to eliminate continuous periods of stress. Management should also be careful not to assign shift duties while operators are in a fatigued condition, because fatigue could reduce an individual's alertness and impact on their decision-making capabilities (Leonard, 1994) *(Ref. 21)*. In the light of reducing and balancing job demand conditions, the impact of occupational stress and worker absenteeism would be reduced, but can only be certified by empirical testing.

VI.B. Job diagnostic survey:

The job diagnostic survey (JDS), developed by Hackman and Oldham (1975) *(Ref. 10)*, intends to diagnose existing jobs to determine whether and how they might be redesigned to improve employee motivation and productivity and to evaluate the effects of job changes have on employees. These effects specifically relate to psychological states employees experience, which is pertinent to engagement and wellbeing. This instrument is based on the theory which proposes that positive personal and work outcomes can be obtained when three psychological states, namely experienced meaningfulness of the work, experienced responsibility for the outcome of the work and knowledge of the outcome of the work are concurrently/simultaneously present for a given employee. These psychological states are created by the presence of five core job dimensions, three relating to enhancing meaningfulness and one each to responsibility for outcomes and knowledge of outcomes. Skill variety, task identity, and task significance enhance meaningfulness, while high autonomy increases experienced responsibility for work and high feedback improves knowledge of results of the job. They maintain that the motivating potential of a job can be calculated in terms of these job dimensions.

The job diagnostic survey of Hackman and Oldham (1975) *(Ref. 10)*, as a measuring tool use three classes of variables:

i)   the objective characteristics of jobs – how jobs are designed to enhance work motivation and work satisfaction;

ii)   personal expressive reactions to the job and the broader work environment;

iii) the readiness of employees to respond positively to enriching work tasks i.e. jobs with high measured potential for generating work motivation.

This instrument is still widely used in different industries to measure motivation and alienation from work, prior and after work redesign/reconstruction.

A job diagnostic survey consequently implies change, which influences different aspects of the work environment where it is performed. Change therefore infers adjustment of amongst other beliefs, behaviors, and practices of a work environment, affecting the organizational culture and the safety culture, which means "the way we do things around here" and mirrors acceptable behavior (Costanza et al, 2016; *(Ref. 5)* García-Granero et al, 2015 *(Ref. 8)*; Martins and Terblanche 2002 *(Ref. 24)*, which is in line with the reconstruction of work proposed by Karasek and Theorell (1990) *(Ref. 19)*.

Although change is part of the existence of any organization and individual, it is often not welcomed and perceived with aversion or even resistance, especially when employees are not adequately consulted. Empirical evidence on studies done in nuclear power plants where the JDS instrument was used showed that change was experienced as extremely stressful. Despite these observations, change may have positive consequences for individuals, and therefore on employee well-being if change is appraised as a positive challenge.

Empirical evidence indicates that the effects of change on employee health and mental well-being of employees differ, if based on change appraisal. Obadia (2011)   *(Ref. 28)* states that an organizational safety culture a mixture of intangible complex social concept is and tangible issue of nuclear safety include. The safety culture concept requires a desired behavioral condition where safety practices depends on motivation and organizational commitment. The desired safety culture cannot be imposed by rules or standards alone and needs to be continuously constructed and modeled by behavior of leaders and managers (Costanza et al, 2016; *(Ref. 5)* García-Granero et al, 2015 *(Ref. 8)*; Martins and Terblanche, 2002 *(Ref. 24)* to ensure employee health and safety well-being through a proactive and preventive organizational management approach.

VI.C. The concept of psychological presence:

Kahn (1992) *(Ref. 18)* explains that the concept of psychological presence means the willingness and ability of an individual to be fully present in the work environment.   The psychological presence will make individuals attentive and focused without the fear of negative consequences. Khan further argues that the willingness and ability to be psychologically present varies with how secure and trusting individuals are in general. Employee engagement is influenced by how cognitively vigilant, emotionally connected and physically involved they are in their jobs. Engaged employees are most likely confident in their role within the work environment and will display higher levels of psychological safety which will be enhanced by a committed and supportive organizational management, clarity on job demand and the opportunity for self-expression.

Woods and Cook (2002) *(Ref. 39)* argue that there should be a greater understanding of the pressures and dilemmas that drive performance as well as understanding complexities and the nature of technical work in context. This understanding will most likely help employees to feel confident in their role within the work environment. Woods and Cook (2002) *(Ref. 39)* further provide three recommendations, namely:

i)   sources of success should be explored despite possibility of failure;

ii)   there should be an understanding to what causes problems to be difficult to solve;

iii) avoid misconceptions such as observation of work is the only means to capture actual experience of work.

Dedicated employees are highly engaged in what they do; therefore they would show fully psychological presence. An absence in psychological presence might be seen through changes in individual behavior, indicating that the employee is experiencing job stress. There might be signs of a decline in work performance and psychological and emotional well-being. The employee might even show a reduced tolerance in challenging situations, effecting organizational functioning. In an extremely complex work environment such as a nuclear power plant, great importance should be attributed to the concept of psychological presence.

VII. TOTAL SAFETY CULTURE

The concept and term "safety culture" was introduced in the field of nuclear energy after the Chernobyl accident and can be explained as a system composed of behaviors, practices, policies and structural components (Meshkati in Misumi, 2005) *(Ref. 28)* and is influenced by the organizational culture within nuclear power plants.

The US NRC defines safety culture as a prevailing condition where all stakeholders are continuously focused on improving safety. A positive safety culture in a nuclear power plant requires therefore total dedication of management and employees. Meshkati in Misumi (2005) *(Ref. 28)* points out that necessary conditions for a positive safety culture in a technological system such as a nuclear power plant include, but are not limited to:

i)   an understanding of systems-related factors affecting human performance;

ii)   determination of the extent to which systems-related factors interact with factors of the organizational culture;

iii) the development of conductive regulations and a supportive regulatory environment.

Ignatov (2005) *(Ref. 12)* suggests that there is a need for a deeper understanding of the cultural and psychological basis of safety behavior in nuclear power plants as shown by studies done on safety practices in nuclear power plants. A safety culture within a nuclear power plant should be disciplined, with highly-trained staff, which is confident, following sound procedures and

practice effective teamwork with effective communication and engagement (Misumi et al., 2005) *(Ref. 28)*. Such a desired safety culture can be achieved if it perceives a positive safety climate and safety behavior with improved employee well-being.

Well-being studies focusing on employee engagement show that few employees are engaged (24% fall in the category highly engaged and 39% fall in the category moderately engage) (Aon Hewitt 2017) *(Ref. 1)*, influencing the organization's safety culture. Van Loggerenberg and Nienaber (2015) *(Ref. 38)* state that organizations are not static; therefore, the safety culture needs to be flexible and organizational leadership should have an open perception of the total safety culture and should move away from the traditional ways of managing safety in a workplace as the only way to manage safety. Creating a healthy workplace requires employee and organizational management engagement, which will increase employee ownership in shaping organizational practices such as the safety culture.

Stress being an inevitable part of any work environment (Karasek and Theorell, 1990 *(Ref. 19)*; Lo Presti and Mauno 2015 *(Ref. 23)* and flexibility in working conditions helps individuals maintaining stable functioning and performance in stressful work environments. It is imperative for the management of a nuclear power plant to perform or oversee regulated activities to establish and maintain a positive safety culture. The 61 FR 24336, published in 1996, describes a safety conscious work environment where employees in the Nuclear Industry have the freedom to raise safety concerns without the fear of retaliation. It also prompts management to review employee concerns and give priority to concerns based on the potential safety significance. The regulation requires management to resolve and provide timely feedback of employee concerns.

A total safety culture within a nuclear power plant requires that all job tasks to be carried out correctly, that employees work with alertness, sound judgements and a proper sense of accountability, which signals the relevance of employee engagement. The International Nuclear Safety Advisory Group (INSAG) *(Ref. 16)* suggests that a safety culture comprises of two major components:

i)   the framework determined by organizational policy and managerial action;

ii)   the response of individuals (employees) in working within and benefitting by the framework

A safety conscious work environment (SCWE) describes a safety culture where the necessary full attention is given to safety matters and the personal dedication and

accountability of all individuals engaged in any activity which has a demeanor on the safety of a nuclear power plant. Studies conducted and described by Reiman et al. (2005) *(Ref. 32)* showed that changes affected more the psychological work characteristics and changes that seem to endanger safety were experienced as highly stressful. Hence, the proposed well-being framework is suited to this environment as well/particularly. This demonstrates that it is not beneficial for the safety culture if only safety values and safety attitudes are developed, which will be met by the proposed framework, illustrated in Figure 1 below.
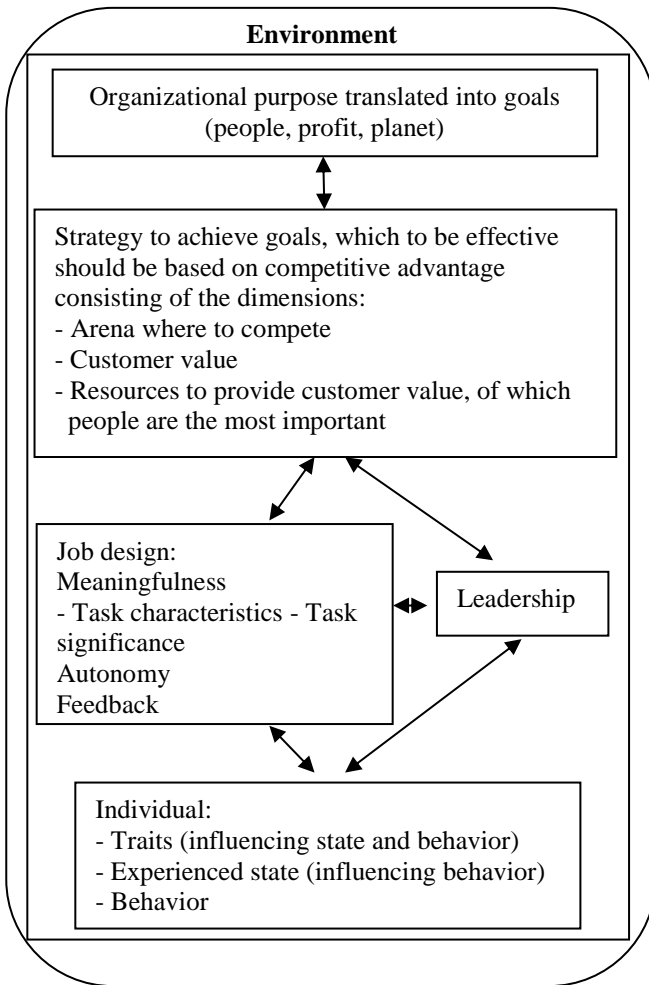

Fig. 1: Framework to facilitate a total safety culture

VII.A. Source:

Figure 1 shows that the organization exists in an environment, which influences the organization. The purpose of the organization is translated to goals representing people (employees, customers and society), profit and the planet. Strategy is the tool organizations use to achieve their goals, and to be effective should be based on competitive advantage. Competitive advantage consists

of three dimensions of which resources, in particular human resources, are the most important. Employees execute strategy in their doing their daily jobs. Jobs should be designed to enhance meaningfulness (by attending to task characteristics such as task identity, variety, task significance, work load), autonomy (including decision latitude) and feedback. Leadership influences job design as well as interactions with the individuals occupying the job.

Essentially Figure 1 shows that both content and context, influencing wellbeing as discussed by Kahn (1990) *(Ref. 18)*, Karasek and Theorell (1990) *(Ref. 19)* and Hackman and Oldham (1975) *(Ref. 10)* are addressed by this framework. Content is easier observable than context as the illustration specifically refers to aspects such as task characteristics which include task identity, task variety, task significance, work load; autonomy which refers to participation and control including decision latitude; and feedback. Context like career development, status, remuneration, insecurity owing to the changing world of work which may lead to layoffs or redeployment, performance management, quality of communication, clarity of organizational goals and self-esteem are only implied. Nevertheless, the framework aims at addressing physical, mental and social wellbeing.

VIII. CONCLUSIONS

An organization that considers employee well-being as a priority will bring about higher employee commitment, performance and sustainability within the organization's framework of success. The ultimate would be a relationship between employees and organizational management resulting in efficient production and service delivery and where employees have reasonable and fair conditions within the workplace. Furthermore such a relationship will ensure employee engagement and provide them with an individual and shared voice on issues of concern. Unfortunately the increase in occupational stress places strain on such an idealist relationship. However, the application of the proposed framework could stand organizations in good stead to enhance wellbeing (for both employees and organization).

Organizational change and stressful situations within the work environment may lead to resistance to change experienced by employees. Therefore it is necessary that employees and organizational management are engaged and confident in their roles and responsibilities. Woods and Cook (2002) *(Ref. 39)* state that change in any work environment must be seen as opportunities to learn how the systems actually functions. Notwithstanding the attention employee well-being and engagement are getting, the results are still poor. Work fatigue experienced as one of the main causes affecting employee well-being in specially

nuclear power plants seem to be increasing in spite of organizational management efforts to increase employee engagement and motivation.

Van Loggerenberg and Nienaber (2015) *(Ref. 38)* argue that organizational leadership is aimed at achieving success (ultimately expressed as financial results) for the organization, consequently, a strong safety culture needs to be woven into the organization. As such, creating a total safety culture requires that a multi-disciplinary approach be developed and sustained within an organization.

Employees' attitudes are influenced by the work environment, practices and behaviors in the work environment. These influences are the molding for developing an effective safety culture. The role and responsibility of the organizational management needs to institute an environment to develop and maintain a total safety culture within the organization, as illustrated in Figure 1.

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